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CANADA—DEPARTMENT OF TRADE AND COMMERCE
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ANNUAL REPORT

ON THE

MINERAL PRODUCTION OF CANADA

DURING THE CALENDAR YEAR

1929

Published by Authority of the Hon. H. H. Stevens, M.P.,
Minister of Trade and Commerce

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LIST OF PUBLICATIONS

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MINING, METALLURGICAL AND CHEMICAL BRANCH DOMINION BUREAU OF STATISTICS

MINERAL PRODUCTION (Mining and Metallurgy)

General Reports

Preliminary Reports (semi-annual) on the Mineral Production of Canada.

Monthly Report on Canada's Leading Mineral Products.

Annual Report on the Mineral Production of Canada. (In one volume).

A comprehensive record of the mining industry embodying historical and world data, detailed information on mineral production, imports and exports for Canada and general statistics relative to the mining industry on capital investment, employment, fuel consumption and power equipment arranged in 10 chapters each dealing with a particular branch of the industry. Statistics on production and trade in mineral products appear in detail in the appropriate chapters. A list of operating companies with their office and plant addresses is included. Fully indexed. Chapter titles are: Canada—The Gold Mining Industry—The Silver Mining Industry—The Nickel-Copper Industry—Miscellaneous Metal Mining Industries—The Non-Ferrous Smelting and Refining Industry—The Coal Mining, Coke, Natural Gas, Peat and Petroleum Industries—Non-Metal Mining Industries (Other than Fuels)—The Clay Products and Other Structural Materials Industries—Directory of Reporting Firms—Notes on the Methods of Computing Values—Index.

Coal—

Monthly and Quarterly Reports on Coal and Coke Statistics for Canada.

A condensed report on production, imports and exports of coal and coke is issued monthly, publication being made about the twentieth of the next following month.

A more general review is published quarterly, showing statistics for each month, for the quarter, and for the year to date on the output by coal-mining districts and by provinces, imports and exports by ports and by kinds of coal, employment in coal-mining, and tonnage lost. There is also a section on coke showing production, imports, exports, distribution and consumption by months and by provincial groups.

Annual Report on Coal Statistics for Canada.

Text and tables showing for Canada, and for each of the coal-producing provinces, historical and current data on output, tonnage lost, disposition of coal from the mines, domestic and foreign shipments, exports and imports by ports, consumption of coal, prices, employment, salaries and wages paid, power equipment, capital investment, etc.

Annual Bulletins—

(*a*) MINERAL PRODUCTION—

Metals.—Arsenic—Cobalt—Copper—Gold—Lead—Nickel—Metals of the Platinum Group—Silver—Zinc—Miscellaneous Metals including Aluminium, Antimony, Chromite, Iron ore, Manganese, Mercury, Molybdenum, Tin, Tungsten.

Non-Metals.—Abrasives—Asbestos—Coal—Feldspar—Gypsum—Iron Oxides—Mica—Natural Gas— Petroleum—Quartz—Salt—Talc and Soapstone—Miscellaneous Non-Metallic Minerals including Actinolite, Barytes, Fluorspar, Graphite, Magnesite, Magnesium Sulphate, Mineral Waters, Natro-Alunite, Peat, Phosphate, Pyrites, Sodium Carbonate, Sodium Sulphate.

Structural Materials.—Cement—Clay and Clay Products—Lime—Sand and Gravel Stone and Slate.

(*b*) MINERAL INDUSTRY.—Each bulletin of this group shows in synopsis, material to be published subsequently as one chapter of the annual report on the *Mineral Production of Canada.* These bulletins are published in mimeograph form from time to time during the year as the necessary material becomes available.

By Industries.—Gold Mining Industry including Alluvial Gold Mining, Auriferous Quartz Mining and Copper-Gold-Silver Mining—Silver-Cobalt and Silver-Lead-Zinc Mining Industry—Nickel-Copper Industry—Miscellaneous Metal Mining Industries—The Non-Ferrous Smelting and Refining Industry—The Coal Mining, Coke, Natural Gas, Peat and Petroleum Industries—Non-Metal Mining Industries (Other than Fuels)—The Clay Products and Other Structural Materials Industries.

SEE INSIDE BACK COVER FOR PUBLICATIONS ON MANUFACTURES BASED CHIEFLY ON MINERALS

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NOTES ON STATISTICS OF PRODUCTION

In the collection of production data, the Dominion Bureau of Statistics makes a division between primary and secondary production. In the first-named class, there are separate sections for the collection of statistics on (a) **Agricultural Products**, (b) **Furs**, (c) **Fish**, (d) **Forest Products**, (e) **Mineral Products.**

In the second are included (a) **Manufacturing** and (b) **Construction.**

Manufacturing is subdivided into nine groups of industries, producing concerns being classified according to the principal component material of their major products. For example, manufactures of leather goods are classified under "Animal Products"; the pulp and paper industry under "Wood and Paper," etc. An outline of the scheme of classification in use for manufacturing industries is given below:—

Manufactures of:

(1) **Vegetable Products, including**—Coffee and Spices; Cocoa and Chocolate; Preserved and Canned Products; Pickles, Vinegar and Cider; Flour and Cereals; Bread and other Bakery Products; Macaroni and Vermicelli; Distilled and Brewed Liquors and Wines; Rubber Products; Starch and Glucose; Sugar; Tobacco Products; Linseed Oil and Oil Cake.

(2) **Animal Products,** including—Fish and Fish Products; Dairy Factory Products; Meat and Meat Products; Leather and Leather Products; Furs and Fur Products.

(3) **Textiles and Textile Products,** including—Cotton Textiles (Cloth, Yarn, Thread and Waste); Woollen Textiles (Cloth, Yarn, Blankets, Felt and Waste); Silk Products; Factory-Made Clothing, Carpets, Rugs and Mats; Cordage, Rope and Twine.

(4) **Wood and Paper,** including—Pulp and Paper Mill Products; Paper Goods; Printing, Publishing and Lithographing; Saw and Planing Mill Products; Furniture, Carriages, Wagons and Sleighs; Wooden Containers; Woodenware; Turned Wood Products; and the Output of Similar Wood-Using Industries.

(5) **Iron and Steel and their Products,** including—Pig Iron and Ferro-Alloys; Steel and Rolled Products; Castings and Forgings; Boilers, Tanks and Engines; Agricultural Implements; Machinery; Automobiles; Auto Parts and Accessories; Bicycles; Railway Rolling Stock; Wire and Wire Goods; Sheet Metal Products; Hardware and Tools; Miscellaneous Iron and Steel Products.

(6) **Manufacture of Non-Ferrous Metals,** including—Aluminium Products; Brass and Copper Products; Lead, Tin and Zinc Products; Jewellery and Silverware; Electrical Apparatus and Supplies; Miscellaneous Non-Ferrous Metal Products; Non-Ferrous Smelting and Refining.

(7) **Manufactures of the Non-Metallic Minerals,** including—Aerated Waters; Asbestos and Allied Products; Cement; Cement Products; Coke and Gas; Glass (blown, cut, ornamental, etc.); Lime; Petroleum Products; Products from Domestic Clays; Products from Imported Clays; Salt; Sand-Lime Brick; Stone Dressing; Miscellaneous Non-Metallic Mineral Products, including (a) Artificial Abrasives and Abrasive Products, (b) Artificial Graphite and Electrodes, (c) Gypsum Products, (d) Mica Products, (e) Miscellaneous Non-Metallic Mineral Products, n.e.s.

(8) **Chemicals and Allied Products,** including—Coal Distillation; Acids, Alkalies and Salts; Compressed Gases; Explosives, Ammunition and Fireworks; Fertilizers; Medicinal and Pharmaceutical Preparations; Paints, Pigments and Varnishes; Soaps and Washing Compounds; Toilet Preparations; Inks; Adhesives; Polishes and Dressing; Wood Distillates and Extracts; Miscellaneous Chemical Products including (a) Baking Powder, (b) Boiler Compounds, (c) Plastics, (d) Insecticides, (e) Sweeping Compounds, (f) Disinfectants; (g) Matches, (h) Dyes and Colours, (i) Chemical Products, n.e.s.

(9) **Miscellaneous Products,** including—Brooms and Brushes; Electric Light and Power; Musical Instruments, etc.

The statistics of manufactures are also classified according to the **use** or **purpose** of the end product as follows:—

(1) **Food,** including—Breadstuffs; Fish; Nuts; Fruits and Vegetables; Meats; Milk Products; Oils and Fats; Sugar; Infusions; Miscellaneous.

(2) **Drink and Tobacco,** including—Beverages, alcoholic; Beverages, non-alcoholic; Tobacco.

(3) **Clothing,** including—Boots and Shoes; Fur Goods; Garments and Personal Furnishings; Gloves and Mitts; Hats and Caps; Knitted Goods; Waterproofs; Miscellaneous.

(4) **Personal Utilities,** including—Jewellery and Time-Pieces; Recreational Supplies; Personal Utilities, n.e.s.

(5) **House Furnishings.**

(6) **Books and Stationery.**

(7) **Vehicles and Vessels.**

(8) **Producers' Materials,** including—Farm Materials; Manufacturers' Materials; Building Materials; General Materials.

(9) **Industrial Equipment,** including—Farming Equipment; Manufacturing Equipment; Trading Equipment; Service Equipment; Light, Heat and Power Equipment; General Equipment.

(10) **Miscellaneous.**

PREFACE

Statistical reports on the mineral production of Canada have been issued annually for many years, first by the Geological Survey, later by the Mines Branch of the Department of Mines, and since 1921 by the Dominion Bureau of Statistics. In addition to production figures on the many metals, non-metals and structural materials produced in Canada, statistics on capital employed in the mining industry, salaries and wages paid, number of employees, and fuel and power consumed are also made available, and in order that a student of the mineral industry may have complete data, imports into, and exports from Canada of minerals and mineral products and world tables of production have been included.

Nineteen twenty-nine was a record year in the mineral industry of the Dominion. Production of many of the principal metals was greater than ever before, and although coal output was slightly under that of 1928 the total value of the fuels group was higher than in the previous year; many other non-metallics, the principal items of which were asbestos, gypsum and salt, showed increases, and the output of structural materials such as cement, lime, clay products, stone, and sand and gravel, reflected active building conditions. But not only in production does 1929 stand out. It was also a year of great activity in the development of new mining properties, the construction of new mills and smelters, and the enlargements of existing mining and metallurgical plants. These conditions prevailed in all the major mineral producing provinces and in addition Manitoba, heretofore thought of principally as an agricultural province, will in 1930 for the first time have a smelter output of copper and zinc.

As in former years the Bureau has continued to co-operate with the provinces of Nova Scotia, New Brunswick, Saskatchewan, Alberta and British Columbia in the collection of coal statistics; and with the provinces of Quebec, Ontario and British Columbia in the collection of annual mineral production returns, thereby lessening the work of the mine and smelter operators in the matter of making returns and also tending to make the compilations more uniform as between the provinces and the Dominion. The Bureau desires to acknowledge its indebtedness to the provincial governments and to other Dominion departments for the valuable assistance rendered in connection with this report.

The thanks of the Bureau are also tendered to mine and smelter operators for assistance given and information made available. The railway and other transportation companies as well as smelter operators outside of Canada have also furnished data, receipt of which is gratefully acknowledged.

The report has been prepared under the direction of Mr. W. H. Losee, B.Sc., chief of the Mining, Metallurgical and Chemical Branch of the Bureau, by Mr. R. J. McDowall, B.Sc., who was assisted by Mr. B. R. Hayden of the Mineral division staff.

R. H. COATS,

Dominion Statistician.

DOMINION BUREAU OF STATISTICS,

OTTAWA, May 7, 1931.

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Table 1.—Quantities and Values of Mineral Products from Canadian Sources 1928 and 1929

—		1928			1929		
		Quantity	Value	Per cent of total	Quantity	Value	Per cent of total
Metallics			$			$	
Arsenic (As^2O^3)	lb.	5,432,223	193,052	0·07	5,230,088	171,320	0·06
Bismuth	lb.	14,002	5,067	.....	194,329	307,114	0·10
Cadmium	lb.	491,894	341,374	0·12	773,976	675,294	0·22
Chromite	tons	.....	.....	.....	126	900	.....
Cobalt	lb.	956,590	1,672,320	0·61	929,415	1,801,915	0·58
Copper	lb.	202,696,046	28,598,249	10·40	248,120,760	43,415,251	13·97
Gold	fine oz.	1,890,592	39,682,065	14·21	1,928,308	39,861,663	12·82
Iron ore sold for export	tons	2,244	6,732	.....	2,748	7,359	.....
Lead	lb.	337,946,688	15,553,231	5·65	326,522,566	16,544,248	5·32
Molybdenite	lb.	.....	.....	.....	16,150	6,400	.....
Nickel	lb.	96,755,578	22,318,907	8·12	110,275,912	27,115,461	8·72
Palladium, Rhodium, Iridium, etc.	fine oz.	13,607	627,833	0·23	17,318	809,289	0·26
Platinum	fine oz.	10,532	708,909	0·26	12,519	846,756	0·27
Silver	fine oz.	21,936,407	12,761,725	4·64	23,143,261	12,264,308	3·94
Zinc	lb.	184,647,374	10,143,050	3·69	197,267,087	10,626,778	3·41
Total		.....	**132,012,454**	**48·00**	.....	**154,451,056**	**49·68**
Non-Metallics—Fuels							
Coal	tons	17,564,293	63,757,833	23·19	17,496,557	63,065,170	20·29
Natural gas	M cu. ft.	22,582,586	8,614,182	3·13	28,378,462	9,977,124	3·21
Peat	tons	1,497	5,845	.....	2,607	13,339	.....
Petroleum, crude	brl.	624,184	2,035,300	0·74	1,117,368	3,731,764	1·20
Total		.....	**74,413,160**	**27·06**	.....	**76,787,397**	**24·70**
Actinolite	tons	70	875	.....	30	375	.....
Asbestos	tons	273,033	11,238,360	4·09	306,055	13,172,581	4·24
Barytes	tons	127	2,847	.....	105	2,341	.....
Beryl crystals	lb.	.....	.....	.....	4,456	114	.....
Bituminous sands	tons	94	374	.....	989	3,956	.....
Diatomite	tons	368	8,960	.....	429	10,330	.....
Feldspar	tons	31,897	284,942	0·10	37,527	340,471	0·11
Fluorspar	tons	.....	.....	.....	17,870	268,120	0·09
Graphite	tons	1,097	57,041	0·02	1,461	103,174	0·03
Grindstones	tons	1,855	100,960	0·04	1,947	106,354	0·03
Gypsum	tons	1,246,368	3,743,648	1·36	1,211,689	3,345,696	1·08
Iron oxides	tons	5,414	111,198	0·04	6,518	115,932	0·04
Magnesite	tons	13,195	346,990	0·13	18,809	491,170	0·16
Manganese, bog	tons	385	2,237	.....	301	1,830	.....
Mica	tons	3,660	87,168	0·03	4,053	118,549	0·04
Mineral water	Imp. gal.	269,045	33,498	0·01	321,905	16,139	.....
Phosphate	tons	641	8,276	.....	1,185	5,380	.....
Quartz	tons	282,522	523,933	0·19	265,949	561,527	0·18
Salt	tons	299,445	1,495,971	0·55	330,264	1,578,086	0·51
Silica brick	M	3,224	155,502	0·06	3,951	173,581	0·06
Soapstone		.....	40,171	0·01	.....	47,986	0·01
Sodium carbonate	tons	519	4,922	.....	600	8,100	.....
Sodium sulphate	tons	0,016	68,804	0·03	5,018	64,112	0·02
Sulphur	tons	38,589	321,033	0·12	42,781	350,843	0·11
Talc	tons	14,925	179,187	0·07	15,509	181,212	0·06
Volcanic dust	tons	485	9,795	.....	300	6,000	.....
Total		.....	**18,826,692**	**6·85**	.....	**21,073,859**	**6·77**
Clay Products and Other Structural Materials							
Brick—Soft mud process, Face	M	17,532	349,847	0·13	26,624	538,096	0·17
Brick—Soft mud process, Common	M	93,280	1,328,981	0·48	77,399	1,195,511	0·39
Brick—Stiff mud process (wire cut), Face	M	101,717	2,247,472	0·82	114,093	2,469,417	0·80
Brick—Stiff mud process (wire cut), Common	M	144,404	2,182,307	0·79	170,840	2,509,451	0·81
Brick—Dry press, Face	M	36,587	748,301	0·27	38,591	813,461	0·26
Brick—Dry press, Common	M	24,294	337,096	0·12	26,131	368,039	0·12
Fancy or ornamental brick	M	599	28,763	0·01	187	12,795	.....
Sewer brick	M	2,888	59,010	0·02	4,765	96,588	0·03
Paving brick	M	338	4,464	.....	97	3,844	.....
Firebrick	M	4,940	234,460	0·09	5,196	251,043	0·08
Fireclay	tons	5,123	35,284	0·01	5,041	35,226	00·1
Kaolin	tons	5	25	.....	.....	.....	.....
Fireclay blocks and shapes		.....	105,091	0·04	.....	130,411	0·04
Hollow blocks	tons	205,257	1,930,152	0·70	221,800	2,214,384	0·71
Roofing tile	No.	72,930	6,435	.....	35,075	4,628	.....
Floor tile (quarries)	sq. ft	171,520	45,729	0·02	307,400	70,186	0·02
Drain tile	M	22,629	656,054	0·24	25,000	720,316	0·23
Sewer pipe, copings, flue linings, etc.	tons	.....	1,723,644	0·63	.....	2,005,887	0·65
Pottery, glazed or unglazed		.....	356,093	0·13	.....	323,194	0·10
Bentonite	tons	20	100	.....	.....	.....	.....
Other clay products		.....	2,410	.....	.....	142,166	0·05
Total		.....	**12,381,718**	**4·50**	.....	**13,904,643**	**4·47**
Cement	brl.	11,023,928	16,739,163	6·10	12,284,081	19,337,235	6·23
Lime	tons	508,889	4,534,568	1·65	674,087	5,908,610	1·90
Sand and gravel	tons	28,102,917	5,809,431	2·11	27,846,945	7,317,814	2·36
Stone—							
Granite	tons	1,195,810	2,366,946	0·86	1,728,165	3,080,815	0·99
Limestone	tons	6,949,420	7,267,437	2·64	7,720,840	8,172,681	2·63
Marble	tons	7,753	414,682	0·15	14,012	434,062	0·14
Sandstone	tons	100,951	223,236	0·08	154,407	398,974	0·13
Total		.....	**37,355,463**	**13·59**	.....	**44,630,191**	**14·38**
Grand total		.....	**274,989,487**	**100·00**	.....	**310,850,246**	**100·00**

Table 2.—Increase or Decrease in Quantities and Values of Mineral Products from Canadian Sources in 1929 as Compared with 1928

—		Increase (+) or Decrease (−) Quantity	Increase (+) or Decrease (−) per cent	Increase (+) or Decrease (−) Value	Increase (+) or Decrease (−) per cent
METALLICS				$	
Arsenic	lb.	− 202,135	− 3·7	− 21,732	− 11·2
Bismuth	lb.	+ 180,327	.....	+ 302,047	.....
Cadmium	lb.	+ 282,082	+ 57·3	+ 333,920	+ 97·8
Chromite	tons	+ 126	.....	+ 900	.....
Cobalt	lb.	− 27,175	− 2·8	+ 129,595	+ 7·7
Copper	lb.	+45,424,714	+ 22·4	+14,817,002	+ 51·8
Gold	fine oz.	+ 37,716	+ 1·9	+ 779,658	+ 1·9
Iron ore sold for export	tons	+ 504	+ 22·4	+ 627	+ 9·3
Lead	lb.	−11,424,122	− 3·4	+ 991,017	+ 6·4
Molybdenite	lb.	+ 16,150	.....	+ 6,400	.....
Nickel	lb.	+13,520,334	+ 13·9	+ 4,796,554	+ 21·5
Palladium, Rhodium, Iridium, etc.	fine oz.	+ 3,711	+ 27·3	+ 181,456	+ 28·9
Platinum	fine oz.	+ 1,987	+ 18·9	+ 137,847	+ 4·6
Silver	fine oz.	+ 1,206,854	+ 5·5	− 497,417	− 3·9
Zinc	lb.	+12,619,713	+ 6·8	+ 483,728	+ 4·8
Total		.....	.....	**+22,441,602**	**+ 17·0**
NON-METALLICS					
Coal	tons	− 67,736	− 0·4	− 692,663	− 1·1
Natural gas	M cu. ft.	+ 5,795,876	+ 25·7	+ 1,362,942	+ 15·8
Peat	tons	+ 1,110	+ 74·2	+ 7,494	+ 128·2
Petroleum	brl.	+ 493,184	+ 79·0	+ 1,696,464	+ 83·4
Total		.....	.....	**+ 2,374,237**	**+ 3·2**
Actinolite	tons	− 40	− 57·1	− 500	− 57·2
Asbestos	tons	+ 33,022	+ 12·1	+ 1,934,221	+ 17·2
Barytes	tons	− 22	− 17·3	− 506	− 17·8
Beryl crystals	lb.	+ 4,456	.....	+ 114	.....
Bituminous sands	tons	+ 895	.....	+ 3,582	.....
Diatomite	tons	+ 61	+ 16·6	+ 1,370	+ 15·3
Feldspar	tons	+ 5,630	+ 17·6	+ 55,529	+ 19·5
Fluorspar	tons	+ 17,870	.....	+ 268,120	.....
Graphite	tons	+ 364	+ 33·2	+ 46,133	+ 80·9
Grindstones	tons	+ 92	+ 4·9	+ 5,394	+ 5·3
Gypsum	tons	− 34,679	− 2·8	− 397,952	− 10·6
Iron oxides	tons	+ 1,104	+ 20·4	+ 4,734	+ 4·2
Magnesite	tons	+ 5,614	+ 42·5	+ 144,180	+ 41·5
Manganese, bog	tons	− 84	− 21·8	− 407	− 18·2
Mica	tons	+ 393	+ 10·7	+ 31,381	+ 36·0
Mineral water	Imp. gal.	+ 52,860	+ 19·6	− 17,359	− 51·8
Phosphate	tons	+ 544	+ 84·8	− 2,896	− 34·9
Sulphur	tons	+ 4,192	+ 10·8	+ 29,810	+ 9·3
Quartz	tons	− 16,573	− 5·8	+ 37,594	+ 7·2
Salt	tons	+ 30,819	+ 10·3	+ 82,115	+ 5·5
Silica brick	M	+ 727	+ 22·5	+ 18,079	+ 11·6
Soapstone		.....	.....	+ 7,815	+ 19·4
Sodium carbonate	tons	+ 8t	+ 15·6	+ 3,178	+ 64·5
Sodium sulphate	tons	− 998	− 16·6	− 4,692	− 6·8
Talc	tons	+ 584	+ 3·9	+ 2,025	+ 1·1
Volcanic dust	tons	− 185	− 38·1	− 3,795	− 38·7
Total		.....	.....	**+ 2,247,267**	**+ 11·9**
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS					
Brick—Soft mud process—Face	M	+ 9,092	+ 41·8	+ 188,249	+ 53·8
Brick—Soft mud process—Common	M	− 15,881	− 17·0	− 133,470	− 1·0
Stiff mud process (wire cut)—Face	M	+ 12,376	+ 12·2	+ 221,945	+ 9·9
Stiff mud process (wire cut)—Common	M	+ 26,436	+ 18·3	+ 327,144	+ 15·0
Dry press—Face	M	+ 2,004	+ 5·5	+ 65,160	+ 8·7
Dry press—Common	M	+ 1,837	+ 7·5	+ 30,943	+ 9·2
Fancy or ornamental brick	M	− 412	− 68·8	− 15,968	− 55·5
Sewer brick	M	+ 1,877	+ 65·0	+ 37,578	+ 63·7
Paving brick	M	− 241	− 71·3	− 620	− 13·9
Firebrick	M	+ 256	+ 5·2	+ 16,583	+ 7·1
Fireclay and other clay	tons	− 82	− 1·6	− 58	− 0·2
Kaolin	tons	− 5	.....	− 25	.....
Fireclay blocks and shapes	$	.....	.....	+ 25,320	+ 24·1
Hollow blocks	tons	+ 16,543	+ 8·1	+ 284,232	+ 14·7
Roofing tile	No.	− 37,855	− 51·9	− 1,807	− 28·1
Floor tile (quarries)	sq. ft.	+ 135,880	+ 79·2	+ 24,457	+ 53·5
Drain tile	M	+ 2,371	+ 10·5	+ 64,262	+ 9·8
Sewer pipe, copings, flue linings, etc.	$	.....	.....	+ 282,243	+ 16·4
Pottery, glazed or unglazed	$	.....	.....	− 32,899	− 9·2
Bentonite	tons	− 20	.....	− 100	.....
Other clay products	$	.....	.....	+ 139,756	.....
Total		.....	.....	**+ 1,522,825**	**+ 12·3**
Cement	brls.	+ 1,260,153	+ 11·4	+ 2,598,072	+ 15·5
Lime	tons	+ 165,198	+ 32·5	+ 1,374,042	+ 30·3
Sand and gravel	tons	− 255,972	− 0·9	+ 1,508,383	+ 25·9
Stone—					
Granite	tons	+ 532,355	+ 44·5	+ 713,869	+ 30·2
Limestone	tons	+ 771,420	+ 11·1	+ 905,244	+ 12·5
Marble	tons	+ 6,259	+ 80·7	− 620	− 0·1
Sandstone	tons	+ 58,456	+ 57·9	+ 175,738	+ 78·7
Total		.....	.....	**+ 7,274,728**	**+ 19·5**
Grand total		.....	.....	**+35,860,759**	**+ 13·0**

Table 3.—Mineral Production of Canada, by Provinces, 1929

—	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Yukon
METALLICS									
Arsenic.....lb.				3,742,913				1,487,175	
$				154,887				16,433	
Bismuth.....lb.				27,446				166,883	
$				23,413				283,701	
Cadmium.....lb.								773,976	
$								675,294	
Chromite.....tons								126	
$								900	
Colbalt.....lb.				929,415					
$				1,801,915					
Copper.....lb.			55,337,169	88,879,853				103,903,738	
$			10,019,901	14,622,572				18,772,778	
Gold.....fine oz.	2,687		90,798	1,622,267	22,455		5	154,204	35,[illegible]
$	55,545		1,876,961	33,535,234	464,186		103	3,187,680	741,[illegible]
Iron ore sold for ex-port. tons			2,748						
$			7,359						
Lead.....lb.			5,358,304	4,769,506				307,999,153	8,395,603
$			270,616	294,431				15,555,189	424,012
Molybdenite.....lb.			16,150						
$			6,400						
Nickel.....lb.				110,275,912					
$				27,115,461					
Palladium, Rhodium, etc.*.....fine oz.				17,141				177	
$				802,453				6,836	
Platinum*.....fine oz.				12,474				45	
$				843,928				2,828	
Silver.....fine oz.	132		813,821	8,890,726	2,644			10,156,408	3,279,530
$	70		431,268	4,711,462	1,401			5,382,185	1,737,922
Zinc.....lb.			19,653,440	5,516,806				172,096,841	
$			1,058,731	297,190				9,270,857	
Totals.....$	**55,615**		**13,671,236**	**84,202,946**	**465,587**		**103**	**53,154,681**	**2,903,888**
NON-METALLICS FUELS									
Coal.....tons	7,056,133	218,706				570,189	7,150,693	2,490,378	458
$	28,071,956	909,169				993,226	22,928,182	10,160,789	1,848
Natural gas....M cu. ft.		678,456		8,586,475	600		19,112,931		
$		333,002		4,959,695	180		4,684,247		
Peat.....tons			1,607	1,000					
$			8,839	4,500					
Petroleum, crude....brl.		7,499		121,194			988,675		
$		19,909		253,678			3,458,177		
Total.....$	**28,071,956**	**1,262,080**	**8,839**	**5,217,873**	**180**	**993,226**	**31,070,606**	**10,160,789**	**1,848**
Other Non-Metallics									
Actinolite.....tons				30					
$				375					
Asbestos.....tons			306,055						
$			13,172,581						
Barytes.....tons	105								
$	2,341								
Beryl crystals.....lb.				4,456					
$				114					
Bituminous sands...tons							989		
$							3,956		
Diatomite.....tons	254							175	
$	5,080							5,250	
Feldspar.....tons			15,790	21,737					
$			133,492	206,979					
Fluorspar.....tons				70				17,800	
$				1,120				267,000	
Graphite.....tons			173	1,288					
$			12,652	90,522					
Grindstones.....tons	6	1,731						210	
$	110	103,514						2,730	
Gypsum.....tons	948,895	70,482		100,347	67,269			24,696	
$	1,152,160	485,982		832,689	631,051			243,814	
Iron oxides.....tons			6,220					298	
$			113,932					2,000	
Magnesite.....tons			18,809						
$			491,170						
Manganese, bog.....tons		300						1	
$		1,800						30	
Mica.....tons			1,062	2,991					
$			72,630	45,919					
Mineral water. Imp. gal.			12,205	309,700					
$			2,488	13,651					
Phosphate.....tons			40					1,145	
$			800					4,580	
Pyrites (see Sulphur)									
Quartz.....tons	11,845		46,444	187,973	10,045			9,642	
$	31,388		132,532	316,050	35,610			45,947	
Salt.....tons	27,819			302,445					
$	157,662			1,420,424					
Silica brick.....M	2,385			1,566					
$	93,207			80,374					

Table 3.—Mineral Production of Canada, by Provinces, 1929—Concluded

—	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Yukon
Soapstone.....tons	.....	.....	.....	.....	.....	.....	.....	.....	.....
$	.....	.....	47,986	.....	.....	.....	.....	.....	.....
Sodium carbonate...tons	.....	.....	.....	.....	.....	.....	.....	600	.....
$	.....	.....	.....	.....	.....	.....	.....	8,100	.....
Sodium sulphate....tons	.....	.....	.....	.....	.....	5,018	.....	.....	.....
$	.....	.....	.....	.....	.....	64,112	.....	.....	.....
Sulphur†.....tons	.....	.....	9,926	4,579	.....	.....	.....	28,276	.....
$	.....	.....	73,119	51,516	.....	.....	.....	226,208	.....
Talc.....tons	.....	.....	.....	15,463	.....	.....	.....	46	.....
$	.....	.....	.....	180,492	.....	.....	.....	720	.....
Volcanic dust.....tons	.....	.....	.....	.....	.....	300	.....	.....	.....
$	.....	.....	.....	.....	.....	6,000	.....	.....	.....
Total..... $	**1,441,948**	**591,296**	**14,253,382**	**3,340,225**	**666,661**	**70,112**	**3,956**	**866,379**	.....
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS									
Brick—									
Soft mud process—									
Face..... M	185	60	1,000	25,379	.....	.....	.....	.....	.....
$	2,405	1,500	12,000	522,191	.....	.....	.....	.....	.....
Common..... M	757	3,471	7,468	38,054	14,409	473	3,390	9,376	.....
$	10,020	55,120	76,963	606,714	234,481	7,031	45,932	159,250	.....
Stiff mud process (wire cut)—									
Face..... M	1,651	432	38,146	63,570	3,040	2,071	2,281	2,903	.....
$	44,654	10,808	771,573	1,333,723	70,940	62,790	67,166	107,763	.....
Common..... M	12,818	2,124	99,818	31,524	.....	10,573	13,896	86	.....
$	160,906	31,860	1,529,751	505,958	.....	121,833	157,250	1,893	.....
Dry press—									
Face..... M	.....	.....	2,990	30,291	.....	1,184	4,125	.....	.....
$	.....	.....	81,333	611,625	.....	38,652	81,851	.....	.....
Common..... M	.....	.....	.....	5,482	.....	.....	18,322	2,327	.....
$	.....	.....	.....	76,016	.....	.....	254,472	37,551	.....
Fancy or ornamental brick.... M	.....	.....	75	111	.....	.....	.....	.....	.....
$	.....	.....	3,783	9,012	.....	.....	.....	.....	.....
Sewer brick..... M	.....	.....	.....	4,631	.....	.....	.....	134	.....
$	.....	.....	.....	92,316	.....	.....	.....	4,272	.....
Paving brick..... M	.....	.....	.....	.....	.....	.....	.....	97	.....
$	.....	.....	.....	.....	.....	.....	.....	3,844	.....
Firebrick..... M	154	.....	.....	.....	.....	809	59	4,175	.....
$	11,340	.....	.....	.....	.....	43,384	2,934	193,385	.....
Fireclay.....tons	2,972	47	.....	.....	.....	754	48	1,220	.....
$	10,669	1,863	.....	.....	.....	5,965	624	16,105	.....
Kaolin.....tons	.....	.....	.....	.....	.....	.....	.....	.....	.....
$	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bentonite.....tons	.....	.....	.....	.....	.....	.....	.....	.....	.....
$	.....	.....	.....	.....	.....	.....	.....	.....	.....
Fireclay blocks and shapes..... $	675	1,351	.....	.....	.....	106,643	.....	21,742	.....
Hollow blocks.....tons	15,455	1,119	49,488	103,454	2,785	13,257	20,812	15,430	.....
$	182,070	23,734	536,084	972,993	41,254	111,072	195,503	151,068	.....
Roofing tile.....No.	.....	.....	.....	35,075	.....	.....	.....	.....	.....
$	.....	.....	.....	4,628	.....	.....	.....	.....	.....
Floor tiles (quarries) sq. ft.	.....	.....	.....	307,400	.....	.....	.....	.....	.....
$	.....	.....	.....	70,186	.....	.....	.....	.....	.....
Drain tile..... M	131	.....	807	22,535	392	25	158	952	.....
$	5,284	.....	28,500	629,322	15,565	1,000	7,711	32,934	.....
Sewer pipe, copings, flue linings, etc.... $	225,128	.....	147,115	1,167,463	.....	.....	335,954	130,227	.....
Pottery, glazed or unglazed..... $	.....	33,770	.....	96,394	.....	.....	193,030	.....	.....
Other clay products $	.....	.....	.....	131,621	.....	4,152	.....	6,393	.....
Total..... $	**653,157**	**160,606**	**3,187,702**	**6,830,162**	**362,240**	**502,522**	**1,342,427**	**866,427**	.....
Cement.....brl.	.....	.....	5,169,408	4,624,712	1,000,258	.....	808,796	680,907	.....
$	.....	.....	7,120,374	6,608,246	2,350,606	.....	1,770,786	1,487,223	.....
Lime.....tons	42,001	15,518	166,802	370,158	32,246	.....	7,681	39,591	.....
$	154,187	174,553	1,264,194	3,364,411	361,104	.....	79,569	510,592	.....
Sand and gravel.....tons	332,599	525,857	6,203,231	11,358,568	1,782,085	3,496,679	1,721,930	2,425,996	.....
$	151,368	46,167	1,534,699	3,462,379	322,430	687,646	447,993	665,132	.....
Stone.....tons	264,706	27,352	3,484,471	5,239,672	192,109	.....	5,183	408,931	.....
$	376,222	204,970	5,317,859	4,736,263	895,017	.....	24,546	511,655	.....
Total..... $	**681,777**	**425,690**	**15,237,126**	**18,171,299**	**3,929,157**	**687,646**	**2,322,894**	**3,174,602**	.....
Grand total..... $	**30,904,453**	**2,439,072**	**46,358,285**	**117,662,505**	**5,423,825**	**2,253,506**	**34,739,986**	**68,162,878**	**2,905,736**

*NOTE.—The 1929 production of platinum metals from Ontario ores included in the above table represents the actual recoveries of refined metals during 1929, from both the Mond and International groups of mines. Heretofore, the Mond Company reported (estimated) precious and rare metals recoverable from concentrates, etc., as determined by assay, while the International company reported actual metal recoveries. In consequence the Mond recoveries for 1929 include a substantial portion of its 1928 metals estimated as recoverable but not actually refined, and so involving certain duplication. Hereafter only figures of actual recoveries by the amalgamated companies will be reported and included in the total mineral output of the Province, and overlapping will thereby be avoided. This note also refers to table 129 on page 115.

†Sulphur content of pyrites at its sales value and estimated figures for quantity and value of sulphur in smelter gases used for acid making.

CANADA
MINERAL PRODUCTION
LEGEND
PRODUCING AREAS
DEVELOPING AREAS
COAL $63065000
COPPER 43415000
GOLD 39862000
NICKEL 27115000
LEAD 16544000
ASBESTOS 13173000
SILVER 12264000
ZINC 10627000
NATURAL GAS 9977000
CHIEF MINERAL PRODUCTS 1929
ONTARIO $117,663,000
B.COLUMBIA 68,163,000
QUEBEC 46,358,000
ALBERTA 34,740,000
N-SCOTIA 30,904,000
MANITOBA 5,424,000
YUKON 2,906,000
N-BRUNSWICK 2,439,000
SASKATCHEWAN 2,254,000
VALUE OF MINERAL PRODUCTION BY PROVINCES 1929
NORTHWEST TERRITORIES
ALBERTA
SASKATCHEWAN
MANITOBA
ONTARIO
QUEBEC
BRITISH COLUMBIA
PACIFIC OCEAN
ATLANTIC OCEAN
Copper Radium
GREAT SLAVE LAKE Lead-Zinc
BELCHER IS. Iron
DAWSON Gold
KEITH Silver Lead
ATLIN Silver Lead Gold
PORTLAND CANAL Copper Gold Silver
ULLOOCET Gold
MOUNTAIN P. Coal
EDMONTON Coal
WAINWRIGHT Gas
COPPER MT. Copper
KOOTENAY Silver Lead Zinc
NANAIMO Coal
HOWE SD. Copper
CROWS NEST
DRUMHELLER Coal
TURNER VALLEY Oil Gas
FORDMOST
Sodium Sulphate
Coal ESTEVAN
Copper Zinc Silver Gold
CENTRAL MANITOBA Gold
RED LAKE Gold
Lignite
MATACHEWAN Copper Gold
KIRKLAND Gold
PORCUPINE Gold
ROUYN Copper Zinc Gold
N.D. MARGES Lead Zinc
COBALT Silver Cobalt
MICHIPICOTEN Gold Iron
SUDBURY Nickel Copper Platinum
Salt GODERICH
PARIS Gypsum
PETROLIA Oil Gas
WINDSOR Salt
L. CHIBOUGAMAU Gold Copper
GASPE Lead Zinc
INVERNESS Coal
CAPE BRETON Coal
PICTOU
NEW BRUNSWICK
CUMBERLAND Coal
MINTO Coal
WINDSOR Gypsum
THETFORD Asbestos

DOMINION BUREAU OF STATISTICS

R. H. COATS, B.A., F.S.S., (Hon.) F.R.S.C., Dominion Statistician

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

ANNUAL REPORT

ON THE

MINERAL PRODUCTION OF CANADA

DURING THE CALENDAR YEAR 1929

CHAPTER ONE

General Review.—Continued expansion and efficient development in the Canadian mining industry resulted in the establishment in 1929 of a new high record mineral production of $310,850,246. This total is greater than that for 1928 by $35,860,759 or 13 per cent, and represents a value of $31.72 per capita. In a survey of the major mineral groups, we find appreciable and general production increases over those of the previous year. Metals retain a position of paramount importance showing a total production of $154,454,056 and a gain of 17 per cent over 1928. Fuels, including coal, peat, natural gas and petroleum, attained a combined value of $76,787,397, an increase of 3 per cent; the other important division of the non-metallics, represented largely by the silicates and various rock forming minerals registered an output valuation of $21,073,959, or 12 per cent more than in 1928; clay products were appraised at $13,904,643 surpassing 1928 by 12 per cent; cement and other structural materials valued at $44,630,191 were 19 per cent higher than last year.

Capital employed in the mining industry of Canada during 1929 amounted to $867,021,033; this wealth, in addition to supplying operating funds for active companies, was utilized in equipping and developing the metallurgical plants and mines of the nation.

This great industry, with its varied and multitudinous activities, supports 95,102 employees in the operation of mines, oil fields, smelters, cement mills and other associated spheres of production; salaries and wages amounted to $124,490,511.

Early history of Canadian mining, gleaned from records of the period of the French regime is closely interwoven with that of the first navigators and explorers to reach our shores. In 1604 discoveries in Nova Scotia of iron and silver were made in St. Marys Bay and later copper was found at Cape d'Or. These minerals were located by Master Simon, a mining engineer in the employ of the celebrated explorer Champlain. A natural history of Acadia, written by Nicolas Denys and published in Paris in 1672 mentions the discovery of coal in Nova Scotia and is the first reference to the occurrence of this mineral in North America; metallurgical operations involving the smelting of bog and other iron ores were carried out on the St. Maurice river and other points along the north shore of the St. Lawrence as early as the year 1730. Other mineral

discoveries followed closely the water routes of both the early French and British explorers; argentiferous galena was found on the shores of Lake Temiskaming at a location within earshot of blasting operations that, some two hundred years later, revealed to the world the silver deposits of the now famous Cobalt camp.

In the far west coal was found at Fort Rupert in 1835, and placer gold was discovered in 1858 along the Fraser and other rivers in British Columbia; these early events in the mining history of this province were forerunners to the more important development of large copper and silver-lead-zinc ore bodies, a development made possible only through the construction of the transcontinental railroads.

Almost coincident with these western discoveries were the efforts of the eastern provinces to establish mining and metallurgical industries capable of supplying the metal requirements of a growing country. During the period from 1843-1870 iron and copper ores were produced in Ontario and Quebec; iron furnaces were operated in the latter province at Three Rivers, Radnor Forges and at Drummondville, the metal recovery coming chiefly from bog ores with charcoal being employed as a fuel. Placer gold deposits of the Beauce district in the basin of the Chaudiere river of Quebec have been known since 1823, and produced up to 1912, gold estimated at between two and one half and three million dollars. In Nova Scotia the production of lode gold from 1862 to 1929 amounted to 922,936 fine ounces.

Railroad construction in Ontario during the years 1883 and 1903 was directly responsible for the discovery of the nickel and silver ores of the Sudbury and Cobalt mining camps. The importance of these ore bodies to the industrial life of Canada is especially emphasized in 1929 by the magnitude of the expansion programme in the mining and metallurgical operations of the International Nickel Company at Sudbury.

Mineral production in the Dominion amounted to $10,000,000 or about $2.23 per capita in 1886. Later and following the sensational placer gold discoveries in the Yukon, production mounted to $66,000,000 or $12.16 per capita. A steady increase in the value of mineral production is recorded from 1904 to 1918, some annual declines were experienced during the post war depression period, this condition was, however, only transitory and with the increasing flow of wealth, largely from the mines of Rouyn, Thetford, Porcupine, Kirkland lake, Sudbury, Trail, and the Pacific coast, Canada has attained a position of prominence in the mining industry of the world, a position which in 1929 places her first in asbestos and nickel, third in production of gold and silver, fourth in lead and copper, sixth in zinc and eleventh in the output of pig iron and coal.

METALLICS.—Metallic mineral production totalled $154,454,056 in 1929 realizing a gain of 17 per cent over 1928.

Arsenic production amounted to 5,230,088 pounds valued at $171,320; this included both white arsenic and arsenic contained in exported concentrates. This output was 202,135 pounds less than in 1928. All the white arsenic manufactured in Canada comes from the Deloro Smelting and Refining Co., Ltd., Deloro, Ont.

Bismuth production in 1929 was very much higher than that of the previous year, amounting to 194,329 pounds worth $307,114. Metallic bismuth was made in 1929 by the Consolidated Mining and Smelting Co., Ltd., Trail, B.C., and by the Deloro Smelting and Refining Co., Ltd., Deloro, Ont.; it is also recovered by foreign refineries from the lead-silver bullion shipped by the latter company.

Cadmium consumption, especially in the electroplating industries, is increasing very rapidly. This metal was produced commercially in Canada for the first time in 1928. The Canadian production in 1929 represented a by-product in the electrolytic refining of zinc by the Consolidated Smelting and Refining Co. at Trail, B.C..

Cobalt at 929,415 pounds and a valuation of $1,801,915, showed a decrease of 27,175 pounds from the 1928 production. This loss was more than compensated by an increase in value of 7·7 per cent; decreasing silver prices were largely responsible for the curtailed Canadian production of 1929.

Copper from the various producers of this metal in Canada amounted to 248,120,760 pounds, a substantial increase over the 1928 production of 202,696,046 pounds. Quebec registered an increase of 21,638,000 pounds, due largely to the increased output from Noranda; in Ontario an enlarged production amounting to 22,000,000 pounds came principally from the expanding copper-nickel industry at Sudbury, while in British Columbia the previous year's record was exceeded by 16,000,000 pounds. Copper on the New York market reached an average price of $0.18 per pound, this is the highest value recorded since 1919.

Production of gold during 1929, from all sources in Canada, amounted to 1,928,308 fine ounces valued at $39,861,663, as against an output of 1,890,592 fine ounces valued at $39,082,005 in 1928. This was the largest output ever recorded.

The total 1929 output was recovered from the following sources: fine gold contained in crude bullion made by gold mines, 1,673,797 fine ounces; alluvial gold, 40,837 fine ounces; fine gold in blister copper and base bullion made at Canadian smelters from Canadian ores, 96,718 fines ounces; the estimated recovery of gold in ores, matte and concentrates exported to foreign smelters, 113,452 fine ounces; and 3,504 fine ounces from miscellaneous sources.

Six provinces and the Yukon produced gold as follows: Nova Scotia, 2,687 fine ounces; Quebec, 90,798 fine ounces; Ontario, 1,622,267 fine ounces; Manitoba 22,455 fine ounces; Alberta, 5 fine ounces; British Columbia, 154,204 fine ounces; Yukon, 35,892 fine ounces. Gold from Nova Scotia was produced in the form of crude bullion and was shipped to the Royal Mint at Ottawa for refining. The greater part of the Quebec output was contained in blister copper made at the Noranda smelter; the remainder was made up from the gold contained in concentrates shipped from the Tetreault silver-lead-zinc property and from auriferous quartz mining in the northwest part of the province.

In Ontario the Porcupine area contributed 932,732 fine ounces; Kirland lake produced 679,504 fine ounces; Sudbury district copper-nickel ores yielded 7,802 fine ounces, and 2,229 fine ounces were recovered from miscellaneous sources.

Gold held third place in point of value among Canada's mineral products in 1929 being surpassed only by coal and copper; the value of gold represented 12·8 per cent of the total mineral production of the Dominion in 1929. As a world producer of gold Canada ranked third; South Africa was first with a production in 1929 of 10,412,326 fine ounces and United States, second with an output of 2,056,629 fine ounces.

Lead in 1929 was less than the 1928 production by 11,424,122 pounds. The value however, of $16,544,248 for this output was 6·3 per cent above that of the previous year and resulted from enhanced prices for the metal. The greater quantity of exported lead goes in the order of its value to Great Britain, Japan, Germany and Belgium; lesser quantities are shipped to various other countries in Europe and the Orient. Metal from the Trail plant of the Consolidated Mining and Smelting Company, Ltd., continues to constitute the greater part of the annual lead production of Canada.

Nickel from the mines of the Sudbury areas and to a small extent from the Cobalt field amounted to 110,275,912 pounds in 1929. This production is a 13·9 per cent increase over that of 1928 and created a new and outstanding high record in nickel mining. This metal output with the impressive value of $27,115,461 emphasizes the rapidly increasing demand and importance of nickel in the industrial world of today. Falconbridge Nickel Mines, Ltd., a new company in the Sudbury field, was active in both mining and metallurgical developments, and the company expects to reach production early in 1930. A general expansion in the nickel

industry has resulted largely from the merger last year of the two older producing organizations into the International Nickel Company of 1929, this new corporation is endowed with the necessary mineral wealth, financial resources, and production equipment to supply the nickel markets of the world.

A silver recovery of 23,143,261 fine ounces from the various Canadian metal mining industries was 5·5 per cent in advance of 1928. There was, unfortunately, a decline in value of $497,417, which loss was due to the almost steady fall in silver prices during recent years. British Columbia, with a production of 10,156,408 fine ounces continues as the leading silver mining province. This output comes largely through the Trail metallurgical plants, from the ores of the immense silver-lead-zinc deposit at the Sullivan mine. Other important silver contributors in the west are the silver-lead mines of the Portland Canal section of British Columbia and the Mayo district of the Yukon. The combined production from British Columbia and the Yukon constitute 58 per cent of the Canadian total. In the eastern provinces, 8,890,726 fine ounces of silver were obtained from the arsenical and cobaltiferous ores of Gowganda, South Lorraine, and Cobalt camps in northern Ontario; while in Quebec 813,821 fine ounces were produced from the lead-zinc ores and the copper-gold ores of the province. Minor quantities of the metal are recovered in the refining of gold bullion from the gold mines in Nova Scotia and Manitoba.

Zinc production in 1929 was higher in both quantity and value than in any previous year in the history of Canadian mining. The output of 197,267,087 pounds was 6·8 per cent greater than in 1928 and the increase in value over the previous year amounts to $483,728. Refined zinc was made at the Trail plant of the Consolidated Mining and Smelting Co., Ltd, and zinc concentrates were shipped to Belgium, from mines at Bradley, Ontario, and Notre Dame des Anges, Quebec. Exploration and mining development on the large copper-zinc deposits of north-western Manitoba, together with the already proven tonnage of these ores in other sections of the country indicate, in Canada, a potential zinc supply of considerable magnitude.

Fuels and Other Non-Metalics.—This division of Canadian mineral production, including among its more important items—coal, natural gas, petroleum, asbestos, gypsum and salt, realized in 1929 a valuation of $97,861,356, an increase of 4·9 per cent over that for the preceding year.

Coal, the principal Canadian mineral product, showed for 1929 a production decrease of 67,736 tons or 0·4 per cent lower than in 1928. The 1929 output was, however, higher than the average for the last five years. In the provinces, Nova Scotia registered an increase of 4·6 per cent; New Brunswick, 5·3 per cent; and Saskatchewan, 23·0 per cent; the national decrease resulted from lessened productions in Alberta and British Columbia. Nova Scotia, New Brunswick, British Columbia and the Yukon mined bituminous coal only; Saskatchewan production is confined to lignites; and Alberta produces bituminous, sub-bituminous, and lignite. Exports of Canadian coal in 1929 amounted to 842,972 tons, a decrease of 2·43 per cent from the 1928 total of 863,941 tons. The United States and Newfoundland afforded the principal foreign markets for Canadian coal; importation of Russian anthracite in 1929 amounted to 117,304 tons. Combined imports of anthracite, bituminous and lignite coal into Canada were 18,619,300 tons as against 17,714,296 tons in 1928. Receipts from Great Britain during the year were 25·98 per cent in excess of the 670,612 tons imported in 1928. The United States shipped into Canada 14,469,831 tons of bituminous, 3,173,043 tons of anthracite, and 14,108 tons of lignite. During 1929 lignite deposits, situated on the Mattagami river in northern Ontario, were investigated by the Ontario Bureau of Mines and considerable development work was done during the year.

Natural gas production from fields in New Brunswick, Ontario, Manitoba and Alberta was 28,378,462 thousand cubic feet valued at $9,977,124, a new high record in the industry, and a gain of 25·7 per cent in quantity and 15·8 per cent in value over the production in 1928. Alberta, with an output of 19,112,931 thousand cubic feet contributes 67·3 per cent of the Canadian total. Natural gas consumed for domestic purposes amounted to approximately 16,000,000 thousand cubic feet and the consumption by the various industries came to 12,000,000 thousand cubic feet.

Crude petroleum from wells in New Brunswick, Ontario and Alberta established in 1929 a new high and impressive record in the oil producing industry of Canada. The various fields produced 1,117,368 barrels valued at $3,731,764. This output exceeded the total of 1928 by 79 per cent in quantity and 83 per cent in value. This striking increase was largely possible through the successful development of the Turner Valley field in Alberta. Drilling was quite active throughout the year in southern Alberta and considerable geological study was given the foothill structures of this same province.

Asbestos production in Canada instituted a new high record in 1929; shipments amounted to 306,055 tons valued at $13,172,581, an increase of 12·1 per cent in quantity and 17·2 per cent in value as compared with the production of the previous year. The average value received by the operators was $43.04 per ton. Canada's exports of asbestos, including sand and waste, reached a grand total of 292,030 tons in 1929. This was made up of 5,843 tons to Great Britain, 232,464 tons to the United States, 14,942 tons to Belgium, 13,996 tons to Germany, 10,698 tons to Japan, and smaller tonnages to several other countries..

Gypsum coming from Canadian quarries and mines in Nova Scotia, New Brunswick, Ontario, Manitoba and British Columbia amounted to 1,211,689 tons during 1929, and was valued at $3,345,696. These figures reveal both volume and value decreases as compared with those of 1928. Nova Scotia contributing 78·2 per cent of the national total continues to occupy a premier position in Canadian gypsum mining; approximately 92 per cent of the production from this province was shipped in crude form to the United States. Ground gypsum and prepared wall plaster exported during 1929 totalled 7,938 tons and consisted principally of shipments to United States, Newfoundland, Australia and New Zealand. Exports of crude gypsum amounted to 893,445 tons, all of which was imported by the United States.

Salt production in Canada reached a new high level during 1929, the output of 330,264 tons was valued at $1,578,086. These figures represent increases of 10·3 per cent in quantity and 5·5 per cent in value over 1928. Ontario contributed 91·6 per cent of the 1929 output, and in Nova Scotia the Malagash mine production was 42 per cent higher than 1928. Shipments during the year, exclusive of the salt content of brine used in the manufacture of chemicals, averaged $8.70 per ton.

Non-metallics include several other quite important minerals. This group is represented largely by various silicates and other rock-forming minerals. Shipments of Canadian feldspar during 1929 increased 17·6 per cent in quanttiy and 19·5 per cent in value over the totals for 1928; the 1929 tonnage amounted to 37,527 tons valued at $340,471; mica production was greater in both volume and value than in 1928; increases were recorded in the output of iron oxides, magnesite, diatomite, talc and grindstones; other non-metallic minerals produced were quartz, pyrites, sodium sulphate, soapstone, phosphate, bog manganese, graphite, beryl crystals, fluorspar, volcanic dust, actinolite and barytes.

Clay Products and Other Structural Materials.—Continued expansion in Canadian construction throughout 1929 was strongly reflected in an almost general increase in the production of building materials. Total sales of clay, and clay products produced from domestic clays, and the value added by manufacturing in the branch of this industry using imported clays, were valued at $16,285,531, the value of clay and clay products sold by Canadian producers during 1929 advanced 13·6 per cent over the preceding year. Cement production in Canada set up a new high record with an output of 12,284,081 barrels valued at $19,337,235; mills in Quebec produced 42·1 per cent of the total Canadian shipments; in Ontario, 37·7 per cent; in Manitoba, 8·1 per cent; in Alberta, 6·6 per cent; and in British Columbia, 5·5 per cent. Sand and gravel production in 1929 amounted to 27,846,945 tons valued at $7,317,814 at compared with 28,102,917 tons at $5,809,431 in 1928. A lime output of 674,087 tons valued as $5,908,610 exceeded in both tonnage and value the production of 1928. Stone production during the year was valued at $17,501,658, which included the value of the quarry output and the value added by manufacturing in the secondary stone industry; shipments of stone from Canadian quarries during 1929 amounted to 9,622,424 tons valued at $12,066,532.

The Provinces

Nova Scotia.—Nova Scotia, with an output valued at $30,904,453, stands fifth among the mineral producing provinces of Canada. This province leads in the Dominion production of barytes, diatomite, gypsum, silica brick and fireclay. Coal is the most important item in the mineral production of Nova Scotia and in 1929 amounted to 7,056,133 tons with a value of $28,071,956.

New-Brunswick.—New Brunswick, in 1929, yielded mineral wealth amounting to $2,439,072 or 0·79 per cent of the Canadian total; this province is essentially a producer of the non-metallics and during the year shipped or produced coal, natural gas, crude petroleum, grindstones, gypsum, bog manganese, clay products and other structural materials. Considerable interest was recently taken in the exploration of copper and nickel deposits situated in the coastal zone.

Quebec.—Quebec has, during the past few years, attained a position of prominence among the mining provinces of Canada. In 1929, the province produced mineral wealth to the value of $46,358,285. This valuation constitutes a new high record for Quebec and retains for her the distinction of being the third most important mineral producing province in Canada. The non-metallic mineral production, largely comprised of asbestos, has, for years, been much greater than the output from the metal mines. This difference, however, has been greatly reduced recently by an increased production in copper, gold, lead and zinc. Production gains in 1929 were made in copper, gold, asbestos, feldspar, graphite, iron oxides, magnesite, mica, sulphur, clay products and other structural materials. Production of lead, zinc and silver was less than the previous year.

Ontario.—Ontario, with a wide variety of economic ore deposits, especially those of the mining camps of Sudbury, Porcupine and Kirkland lake, is endowed with an abundance of potential mineral resources; resources whose intense development during the past few years is reflected by the general prosperity of the mining industry in 1929. Substantial gains were recorded in all of the principal mineral outputs and production valued at $117,662,505, created a new high record for the province. This amount is 37·8 per cent of the grand total for Canada, and establishes Ontario as the premier mineral producing province in the Dominion. The valuation by groups gives metallics, $84,202,946; fuels, $5,217,873; other non-metallics, $3,240,225, and clay products, $6,830,162. Production of cement, stone, lime, sand and gravel amounted to $18,171,299 which represents, for these products, an increase of 27·5 per cent over that for 1928.

Manitoba.—Manitoba's mines and associated mineral industries yielded, in 1929, mineral wealth valued at $5,423,825. Gold production amounted to $464,186 and was the most important item in the metal group; mineral fuel production was practically negligible and other non-metallics, chief of which was gypsum, totalled $631,051. The various clay products and other structural materials, including the output from cement works, lime plants, stone quarries, sand pits, and gravel operations, totalled $4,291,397. Mineral production in Manitoba during 1929 showed substantial increases in all the main divisions of the industry and realized a gain of 29·5 per cent over the output of 1928. Construction on important metallurgical plants and development of ore reserves at the Flin Flon and Sherritt-Gordon mines, in the northwest part of the province, have progressed rapidly throughout the year and indicate that Manitoba will become one of the copper-zinc producing provinces in 1930.

Saskatchewan.—Saskatchewan produces no metalliferous ores; the mineral production of this province comes almost entirely from the coal, clay, and structural material industries. In 1929 the value of coal produced was $993,226, this being an increase of $161,735 above that of 1928. The total value of the mineral production for the year amounted to $2,253,506 representing an increase of 31 per cent over the previous year. Sodium sulphate and volcanic ash shipments were valued at $70,112; sand and gravel production totalled $687,646 and the output of various clays and clay products possessed a value of $502,522.

ALBERTA.—Alberta, in 1929, was the leading fuel producing province in Canada. The total value of coal, natural gas and petroleum was $31,070,606 as compared with $29,051,052 in 1928. Oil and gas wells, especially in the southern sections of the province, are important contributors to the annual mineral production of Alberta. Geological investigation and technical research on the bituminous sands of the Athabaska section suggest the possibility of these large deposits becoming of early economic importance; 989 tons of this material were shipped during the year. The total mineral production for 1929 realized a value of $34,739,986, an increase of 6·8 per cent over that of the preceding year.

BRITISH COLUMBIA.—British Columbia, second in importance among the mineral producing provinces of Canada, produced in 1929 mineral wealth to the value of $68,162,878. This is a new high record for this province and shows an increase of 5·7 per cent over the value for 1928. Of the combined Canadian mineral yield, British Columbia contributed 41 per cent of the copper; 43 per cent of the silver; 8 per cent of the gold; 94 per cent of the lead and 87 per cent of the zinc. Included in the wide variety of metals and minerals produced in British Columbia are: arsenic, bismuth, cadmium, chromite, fluorspar, gypsum, iron oxides, phosphate, pyrites, quartz and sodium carbonate. Coal is mined on Vancouver Island, along the Crowsnest Pass and in different parts of the interior. Clay products and structural materials including cement, lime, stone, sand and gravel were valued at $4,041,029. In the Trail plants of the Consolidated Mining and Smelting Company, Canada possesses one of the largest and most efficient metallurgical institutions of the world; a superphosphate unit, now under construction, is one of the more recent additions to this great industrial development.

YUKON.—Yukon mineral production in 1929 was confined to gold, lead, silver and coal; this output valued at $2,905,736 was $195,779 more than in the previous year. Gold was recovered from alluvial deposits and the silver-lead production resulted from smelter treatment of concentrates shipped by mines in the Mayo district. This territory contains 2,840 square miles of coal lands with an estimated probable reserve of 250,000,000 tons of bituminous and 4,690,000,000 tons of lignite coal.

NORTHWEST TERRITORIES.—Franklin, Keewatin and Mackenzie, constituting the Northwest Territories of Canada, and exclusive of Hudson and Ungava bays, comprise an area of 1,309,682 square miles, or greater than that of British India.

Mineral wealth, although little developed, is known to exist in several sections; wells drilled in the vicinity of Fort Norman on the lower Mackenzie, are stated to have proven this area to be a potential oil field of the future. Large deposits of lead-zinc ores occurring at Great Slave lake were actively explored during the field season of 1929. Prospecting and investigations of a preliminary nature were carried out on the chalcocite, bornite, and native copper occurrences south of Coronation Gulf, and in the eastern districts systematic exploration centred around the Chesterfield inlet and Baker lake areas. The large hematite deposits of the Belcher islands were re-examined as to their possible economic importance and it is suggested that the opening of Fort Churchill as an ocean port may be a deciding factor in the future development of these iron ores.

Exploration and prospecting were greatly stimulated and advanced in the Territories by the adoption of aerial transportation. The efficiency of this mode of travel is especialy emphasized in the enormous amount of reconnaissance accomplished as in contrast with the slower and laborious methods by canoe and pack trail.

INDUSTRIAL REVIEW.—The capital employed in Canadian mines in 1929 amounted to $867,021,033 of which $427,498,173 was invested in metal mining and metallurgical works; $264,885,834 in coal mines and oil and gas wells; $52,416,662 in other non-metal mining enterprises such as asbestos, feldspar, graphite, etc.; $34,190,056 in the clay products industry; and $88,030,308 in properties producing cement, lime, sand and gravel and stone.

Investments in coal mining and in gold quartz mining and milling each accounted for 16 per cent of the total capital employed in the mining industry; metallurgical works represented another 17 per cent; natural gas, 8 per cent; nickel-copper mining, 2 per cent; cement manufacture, 6 per cent; clay products about 4 per cent, and stone quarrying, 2 per cent. Ontario mines accounted for 35 per cent of the total investment in the industry. For the other provinces, the relative capital investments in mining expressed in percentages of the total for Canada were as follows: British Columbia, 19 per cent; Quebec, 16 per cent; Alberta, 16 per cent; Nova Scotia, 8 per cent; Manitoba, 2 per cent; the remaining 2 per cent represented the investment in the provinces of New Brunswick, Saskatchewan and the Yukon Territory.

Salaries and wages paid to 95,102 employees amounted to $124,490,511 of which $50,279,511 was distributed among 31,125 individuals in the metal mines and metallurgical works; 40,080 people employed in oil and gas fields, coal and other non-metals mines, received $55,602,313 and clay products and other structural materials industries had 23,897 employees who received $18,608,687. In the metal mining and metallurgical group there was a marked and steady increase in the number employed during the past five years and in the total of fuels and other non-metallic mining industries the number employed was greater than in 1928, establishing a record year for this group. In the manufacture of clay products and in the production of cement, lime, sand and gravel and stone the total number of men was the largest in the past five years. More complete returns of sand and gravel production were obtained from the province of Quebec since 1926, through co-operation with the Bureau of Mines and the Provincial Roads Department, Quebec.

The total cost of fuel and electricity used in the mining industry in Canada was $26,751,585. This figure does not include the coke used in non-ferrous smelting furnaces which amounted to $3,280,757 in 1929.

Products of the mines, smelters, quarries, sand pits, oil and gas wells, clay products and cement industries, in Canada during 1929, had a net value of $315,181,388 as against $279,820,914 in 1928 and $190,845,547 in 1924. These figures must not be confused with the figures given as the value of mineral production; in calculating the mineral production values, the metals recovered from Canadian ores are valued at average annual prices for these metals in recognized world markets, but the figures given above represent the actual net return to the mines or metallurgical works regardless of the metal content of the shipments or the distance that the ore and other products must be shipped.

Imports and Exports.—Imports into Canada during the calendar year 1929 of minerals and allied products reached a value of $659,219,678 as against $591,039,110 in 1928. These consisted of iron and its products valued at $342,480,427, non-ferrous metals worth $90,686,274, non-metallic minerals valued at $185,921,799, and chemicals and allied products worth $40,131,178. In the previous year imports of iron and its products were valued at $322,963,610, non-ferrous metals, $68,939,379, non-metallic minerals, $162,172,427, and chemicals and allied products $36,963,694. Exports of similar products during the same period had a total value of $289,813,395 as compared with $218,894,546 in 1928. The 1929 exports of iron and its products were valued at $90,101,565 as against $70,665,677 in the previous year; non-ferrous metals, $148,164,138 as against $103,411,613; non-metallic minerals, $29,559,453 as against $26,395,420; and chemicals and allied products, $21,988,239 as compared with $18,544,836 during the year ending December 31, 1928.

An analysis of Canada's external trade in these four groups during 1929 shows that the value of imports from the United States made up 85·5 per cent of the total brought in from all foreign sources; 7·4 per cent of the value of purchases represented goods from the United Kingdom; and the remainder was derived from other countries, chief among which were: Belgium, Germany, Sweden, France, Switzerland and the Netherlands.

Of the total exports of these same groups, 47·9 per cent went to the United States and 25·6 per cent to the British Empire, of which the United Kingdom, Australia, British India and New Zealand were the largest purchasers. Among the remaining countries of the world, the largest importers were: Japan, Argentina, Germany, the Netherlands, China, France, Brazil and Dutch East Indies.

The largest items among Canada's exports of iron and its products were automobiles and automobile parts valued at $47,000,000 and farm implements worth nearly $20,000,000; among the non-ferrous metals, gold and silver in the form of bullion and in ore was valued at nearly $42,000,000; nickel in its various forms, $26,000,000; pig lead and lead in ore, $11,000,000; copper in blister form, in ores exported, scrap wire, etc., $37,400,000; zinc spelter, in ore and zinc scrap, $9,000,000; and aluminium in bars, blocks, scrap and in manufactured form, $15,000,000.

Among the exports of the non-metallic mineral products, asbestos took first place at nearly $13,000,000, followed by coal worth $4,300,000; artificial abrasive exports amounted to over $3,800,000, while crude petroleum and gypsum sent out of the country were each valued at more than $1,000,000. Other important Canadian non-metallic minerals exported were feldspar, talc and magnesite.

In the chemicals and allied products group the chief items exported were cyanamide at $6,400,000; acids, $4,800,000; soda and soda compounds, $4,200,000; ammonium sulphate, $909,510, and calcium carbide, $700,000.

Prices.—The Bureau's index number of articles of mineral origin, raw and partly manufactured, indicated lower price levels generally when compared with the base (1926=100). In January, and February, 1929, the index for this group was 92·7, in March it rose to 94·4 and was followed in April by a recession to 93·3; from May until the end of the year the index number fluctuated between 92 and 93. Higher prices for copper accounted for an increase in the index for non-ferrous metals and their products from 88·7 in 1928 to 92·2 in 1929; in the non-metallic minerals and products a slight advance from 92·9 in 1928 to 93·5 in 1929 was due chiefly to higher prices for coke, coal and glass. Silver prices declined more sharply than at any time since 1920; the position of zinc was weaker; lead was relatively stronger than many others of the non-ferrous group and nickel maintained a price which has remained approximately constant for some years.

Table 4.—Exchange Table Showing Average Monthly Quotations for New York Funds at Montreal, 1925-1929

Month	1925	1926	1927	1928	1929
	$	$	$	$	$
January	1·0026	1·0020	1·0016	1·0018	1·0027
February	1·0014	1·0034	1·0016	1·0019	1·0038
March	1·0013	1·0037	1·0037	1·0000	1·0060
April	1·0005	0·9996	0·9990	0·9997	1·0076
May	1·0000	0·9992	0·9993	1·0009	1·0068
June	1·0000	0·9989	1·0005	1·0024	1·0083
July	0·9995	0·9987	1·0015	1·0021	1·0049
August	0·9995	0·9985	1·0006	1·0000	1·0056
September	1·0001	0·9986	0·9995	0·9996	1·0076
October	0·9992	0·9993	0·9989	1·0003	1·0144
November	0·9992	0·9986	0·9986	0·9999	1·0157
December	1·0003	1·0006	1·0010	1·0021	1·0078
Average	**1·0003**	**1·0001**	**1·0005**	**1·0009**	**1·0076**

Table 5.—Metal Prices, 1925-1929

Commodity	Market	Unit	1925	1926	1927	1928	1929
			$	$	$	$	$
Antimony (ordinaries)	New York	Pound	0·17494	0·15988	0·12393	0·10305	0·08956
Arsenic, white	New York	Pound	0·0466	0·0350	0·0383	0·04	0·04
Cobalt	New York	Pound	2·50	2·50	2·50	2·63	2·52
Cobalt oxide	New York	Pound	2·10	2·10	2·10	2·10	2·10
Copper	New York	Pound	0·14042	0·13795	0·12920	0·14570	0·18107
	Montreal	Pound	0·1615	0·1577	0·1478	0·16402	0·19978
Lead	New York	Pound	0·09020	0·08417	0·06755	0·06305	0·06833
	Montreal	Pound	0·0912	0·08154	0·0673	0·0606	0·06678
	Toronto	Pound	0·0919	0·08274	0·0683	0·06206	0·06775
	London	Pound	0·07914	0·06751	0·05256	0·04576	0·05054
Nickel	New York	Pound	0·34	0·36	0·36	0·36	0·35
Platinum	New York	Ounce	119·093	113·269	84·636	78·580	67·655
Silver	New York	Ounce	0·69065	0·62107	0·56370	0·58176	0·52093
Tin	New York	Pound	0·56790	0·63615	0·62747	*0·50427	0·45155
Zinc	St. Louis	Pound	0·07622	0·07337	0·06242	0·06027	0·06512
	Montreal	Pound	0·0906	0·08825	0·07710	0·07144	0·0687
	London	Pound	0·07956	0·07410	0·06194	0·05493	0·05386

*Straits tin in 1928. Quotations on 99 per cent tin is continued on April 1, 1928 because of absence of business.

Table 6.—Average Prices of the Principal Metals, 1899-1929 (a)

Year	Copper		Lead			Tin	
	Electrolytic	Standard					
	New York	London	New York	St. Louis	London	(f) New York	(b) London
1899	16·670	73·687	4·470	4·340	14·933	25·120	122·429
1900	16·190	73·625	4·370	4·240	16·987	29·900	133·575
1901	16·110	66·983	4·330	4·200	12·521	26·740	118·633
1902	11·626	52·460	4·069	3·939	11·262	26·790	120·720
1903	13·235	57·970	4·237	4·107	11·579	28·090	127·320
1904	12·823	58·881	4·309	4·179	11·983	27·690	126·733
1905	15·590	69·465	4·707	4·577	13·719	31·358	143·083
1906	19·278	87·282	5·657	5·527	17·370	39·819	180·646
1907	20·004	87·007	5·325	5·195	19·034	38·166	172·638
1908	13·208	59·902	4·200	4·070	13·439	29·465	133·124
1909	12·982	58·732	4·273	4·153	13·042	29·725	134·774
1910	12·738	57·054	4·446	4·312	12·920	34·123	155·308
1911	12·376	55·973	4·420	4·286	13·970	42·281	192·353
1912	16·341	72·942	4·471	4·360	17·929	46·096	209·420
1913	15·260	68·335	4·370	4·238	18·743	44·252	201·679
1914	13·602	(c) 61·524	3·862	3·737	(c) 19·076	34·301	(c) 156·564
1915	17·275	72·532	4·073	4·567	22·917	38·590	163·960
1916	27·202	116·059	6·858	6·777	31·359	43·480	182·096
1917	27·180	124·892	8·787	8·721	30·500	61·802	237·562
1918	(d) 24·628	115·530	7·413	7·222	30·100	(e)	330·138
1919	18·691	90·796	5·759	5·530	28·590	63·328	257·601
1920	17·456	97·480	7·957	7·830	37·832	49·101	295·866
1921	12·502	69·356	4·545	4·303	22·752	29·916	165·265
1922	13·382	62·123	5·734	5·503	24·097	32·554	159·450
1923	14·421	65·840	7·267	7·141	27·147	42·664	202·148
1924	13·024	63·149	8·097	7·969	34·421	50·176	248·737
1925	14·042	61·920	9·020	8·817	36·429	57·893	260·974
1926	13·795	57·971	8·417	8·223	31·075	65·285	291·016
1927	12·920	55·653	6·755	6·511	24·102	64·353	288·953
1928	14·570	63·793	6·305	6·131	21·660	50·427	227·131
1929	18·107	75·416	6·833	6·660	23·246	45·155	203·850

Year	Zinc		Antimony, New York	Quicksilver, New York	Aluminum, New York (g)	Silver, New York	Platinum, New York
	St. Louis	London					
1899	5·600	24·858	9·430	43·63	32·72	59·580	15·22
1900	4·240	20·274	9·500	51·00	32·72	61·330	18·09
1901	3·930	17·029	8·250	47·00	33·00	58·950	20·00
1902	4·690	18·545	6·120	48·03	33·00	52·160	19·00
1903	5·191	20·970	6·000	41·32	33·00	53·570	18·91
1904	4·931	22·591	6·371	41·00	35·00	57·221	19·50
1905	5·730	25·433	10·250	38·50	35·00	60·352	20·34
1906	6·048	27·020	21·730	40·90	35·75	66·791	28·04
1907	5·812	23·771	14·840	41·50	45·00	65·327	30·98
1908	4·578	20·163	8·004	44·84	28·70	52·864	16·32
1909	5·352	22·185	7·466	46·30	22·00	51·502	24·87
1910	5·370	23·050	7·386	47·06	22·25	53·486	32·70
1911	5·608	25·281	7·540	46·54	20·07	53·304	43·12
1912	6·799	26·421	7·760	42·46	22·01	60·835	45·55
1913	5·504	22·746	7·520	39·54	23·64	59·791	44·88
1914	5·061	(c) 22·544	8·763	48·31	18·63	54·811	45·14
1915	13·054	67·553	30·280	87·01	33·98	49·684	47·13
1916	12·634	72·071	25·370	125·49	60·71	65·661	83·40
1917	8·730	52·413	20·690	106·30	51·59	81·417	102·82
1918	7·890	54·180	12·581	123·47	33·53	96·772	105·95
1919	6·988	42·879	8·190	92·15	(e)	111·122	114·61
1920	7·671	44·372	8·485	81·12	32·72	100·900	110·90
1921	4·655	25·845	4·957	45·46	21·11	62·654	75·03
1922	5·716	30·003	5·471	58·95	18·68	67·528	97·62
1923	6·607	33·058	7·897	66·50	25·41	64·873	116·54
1924	6·344	33·728	10·836	69·76	27·03	66·781	118·82
1925	7·622	36·624	17·494	83·13	27·19	69·065	119·09
1926	7·337	34·105	15·988	91·90	26·99	62·107	113·27
1927	6·242	28·513	12·393	118·16	25·40	56·370	84·64
1928	6·027	25·284	10·305	123·51	23·90	58·176	78·58
1929	6·512	24·790	8·956	122·14	23·90	52·993	67·66

(a) Authorities: Metallgesellschaft—London prices of copper, 1899–1901; of zinc, 1899–1904; of tin, 1989–1913. American Metal Market—aluminum, 1922–1929. W. R. Ingalls—St. Louis lead, 1899–1908 and St. Louis zinc, 1899–1901. All other prices from Engineering and Mining Journal. (b) Standard tin. (c) Average of nine months; no quotations during August, September, and October. (d) Average of 11 months; no quotations in December. (e) No average computed. (f) 99 per cent tin 1899–1919; Straits tin, 1920–1929. (g) Refer also to page 122.

Quotations for copper, lead, tin, zinc, antimony, and aluminum, in New York or St. Louis, are in cents per pound. Quicksilver prices are per flask of 75 lb. Silver is quoted in cents per ounce; platinum, dollars per ounce. All London quotations are given in pounds sterling per long ton.

From 1929 Year Book of the American Bureau of Metal Statistics.

Table 7.—Prices of Non-Metallic Minerals and Structural Materials, 1925-1929, Showing the Average Returns Received by Producers, f.o.b. Shipping Points in Canada as Computed from the Total Receipts and Total Shipments for the Year

Commodity	Unit	1925	1926	1927	1928	1929
		$	$	$	$	$
NON-METALLICS						
Actinolite	Ton	12·50	12·50	12·50	12·50	12·5
Asbestos	Ton	30·95	36·14	38·65	41·16	43·03
Barytes	Ton	23·77	23·07	22·64	22·41	22·29
Bituminous sands	Ton	4·00	4·00	4·00	4·00	4·00
Coal	Ton	3·75	3·63	3·55	3·63	3·60
Diatomite	Ton	.....	.....	25·00	24·34	24·07
Feldspar	Ton	8·22	8·63	8·68	8·96	9·07
Fluorspar	Ton	4·94	.....	.....	.....	15·05
Garnets	Ton	.....	.....	75·00	.....	.....
Graphite	Ton	61·79	71·45	61·04	52·00	70·61
Grinding pebbles	Ton	9·00	9·00	.....	.....	.....
Grindstones	Ton	48·46	56·11	55·53	54·42	54·62
Gypsum (crushed)	Ton	1·83	3·13	3·06	3·00	2·76
Iron Oxides	Ton	12·91	15·37	16·90	20·54	17·78
Magnesite	Ton	21·93	39·07	31·39	26·37	26·11
Magnesium sulphate	Ton	.....	.....	.....	.....	.....
Manganese, Bog	Ton	.....	.....	.....	5·81	6·08
Mica (rough cobbed)	Pound	0·05	0·04	0·03	0·01	0·01
Mineral water	Gal	0·14	0·14	0·04	0·12	0·05
Natro-alunite	Ton	50·00	.....	35·43	.....	.....
Natural gas	M cu. ft	0·40	0·39	0·38	0·38	0·41
Peat	Ton	6·12	.....	.....	3·90	5·11
Petroleum, crude	Brl	3·76	3·59	3·18	3·26	3·33
Phosphate	Ton	11·81	20·00	11·37	12·90	4·54
Pyrites	Ton	3·77	3·58	3·90	.....	.....
Quartz	Ton	1·84	2·38	2·12	1·85	1·11
Salt	Ton	6·04	5·63	6·00	4·99	4·77
Silica brick	M	.....	.....	44·40	48·23	43·93
Sodium carbonate	Ton	7·26	9·02	12·41	9·48	13·47
Sodium sulphate	Ton	5·06	2·00	2·00	11·43	12·7
Sulphur	Ton	.....	.....	.....	8·32	8·20
Talc	Ton	14·22	13·77	14·29	12·00	11·68
Volcanic dust	Ton	8·62	7·00	7·00	20·19	20·00
STRUCTURAL MATERIALS AND CLAY PRODUCTS						
Cement, portland and puzzolan	Brl	1·73	1·49	1·43	1·51	1·57
Clay products—						
Brick, common	M	.....	.....	.....	.....	.....
Brick, pressed	M	.....	.....	.....	.....	.....
Brick, hollow building	M	.....	.....	.....	.....	.....
Brick, moulded and ornamental	M	.....	.....	.....	.....	.....
Brick, face — Soft mud process	M	18·83	19·71	20·67	19·95	20·21
Brick, common — Soft mud process	M	11·20	14·65	16·44	14·25	15·44
Brick, face — Stiff mud process, wire cut	M	20·06	21·24	21·19	22·09	21·64
Brick, common — Stiff mud process, wire cut	M	14·08	17·26	14·90	15·11	14·68
Brick, face — Dry press	M	21·50	21·40	20·96	20·45	21·07
Brick, common — Dry press	M	12·24	13·40	12·79	13·87	14·08
Brick, fancy or ornamental	M	50·20	52·07	47·37	48·01	68·42
Brick, sewer	M	21·07	17·90	19·15	20·43	20·27
Firebrick	M	49·27	45·83	45·70	47·46	48·31
Fireclay	Ton	10·50	9·25	7·08	6·88	6·98
Hollow blocks	Ton	9·46	9·25	9·45	9·20	9·98
Floor tile	Sq. ft	0·20	0·22	0·24	0·26	0·23
Kaolin	Ton	.....	.....	.....	5·00	.....
Paving brick	M	.....	41·10	42·12	13·20	39·62
Roofing tile	No	0·08	0·09	0·07	0·03	0·13
Sewer pipe	Ton	19·51	19·48	19·10	.....	.....
Tile, drain	M	27·59	27·77	26·86	28·99	28·81
Lime	Bush	0·33	0·32	0·30	0·31	0·31
Sand and gravel	Ton	0·29	0·28	0·26	0·21	0·26
Stone—						
Granite	Ton	2·07	1·48	1·89	1·98	1·78
Limestone	Ton	1·08	1·07	1·10	1·04	1·05
Marble	Ton	83·69	98·50	96·57	53·48	29·55
Sandstone	Ton	1·66	2·54	1·75	2·21	2·50

Table 8.—Annual Values of the Mineral Production of Canada, 1886-1929

Year	Value of production	Value per capita	Year.	Value of production	Value per capita
	$	$		$	$
1886	10,221,255	2·23	1908	85,557,101	13·16
1887	10,321,331	2·23	1909	91,831,441	13·70
1888	12,518,894	2·67	1910	106,823,623	14·93
1889	14,013,113	2·96	1911	103,220,994	14·32
1890	16,763,353	3·50	1912	135,048,296	18·33
1891	18,276,616	3·92	1913	145,634,812	19·35
1892	16,623,415	3·39	1914	128,863,075	16·75
1893	20,035,082	4·04	1915	137,109,171	17·44
1894	19,931,158	3·98	1916	177,201,534	22·05
1895	20,505,917	4·05	1917	189,646,821	23·18
1896	22,474,256	4·38	1918	211,301,897	25·37
1897	28,485,023	5·49	1919	176,686,390	20·84
1898	38,412,431	7·32	1920	227,859,665	26·40
1899	49,234,065	9·27	1921	171,923,342	19·56
1900	64,400,877	12·04	1922	184,297,242	20·55
1901	65,797,911	12·16	1923	214,079,331	23·41
1902	63,231,836	11·36	1924	209,583,406	22·71
1903	61,740,513	10·83	1925	226,583,333	24·19
1904	60,082,771	10·27	1926	240,437,123	25·61
1905	69,078,999	11·49	1927	247,356,695	25·99
1906	79,286,697	12·81	1928	274,989,487	28·07
1907	86,865,202	13·75	1929	310,850,246	31·28

Table 9.—Annual Values of the Mineral Production of Canada by Classes, 1907–1929 and by Provinces for 1929

Year	Metallics	Non-metallics including fuels	Clay products and other structural materials	Total
Canada—	$	$	$	$
1907	42,426,607	31,275,546	12,863,049	(a)86,865,202
1908	41,774,362	32,142,784	11,339,955	(a)85,557,101
1909	44,156,841	31,141,251	16,533,349	91,831,441
1910	49,438,873	37,757,158	19,627,592	106,823,623
1911	46,105,425	34,405,960	22,709,611	103,220,994
1912	61,172,753	45,080,674	28,794,869	135,048,296
1913	66,361,351	48,463,709	30,809,752	145,634,812
1914	59,386,619	43,467,229	26,009,227	128,863,075
1915	75,814,841	43,373,571	17,920,759	137,109,171
1916	106,319,365	53,414,983	17,467,186	177,201,534
1917	106,455,147	63,354,363	19,837,311	189,646,821
1918	114,549,152	77,621,946	19,130,799	211,301,897
1919	73,262,793	76,002,087	27,421,510	176,686,390
1920	77,939,630	108,027,947	41,892,088	227,859,665
1921	49,343,232	87,842,682	34,737,428	171,923,342
1922	61,785,707	82,976,794	39,534,741	184,297,242
1923	84,391,218	91,936,732	37,751,381	214,079,331
1924	102,406,528	71,796,009	35,380,869	209,583,406
1925	117,082,298	71,851,801	37,649,234	226,583,333
1926	115,237,581	85,240,144	39,959,398	240,437,123
1927	113,561,030	88,986,246	44,809,419	247,356,695
1928	132,012,454	93,239,852	49,737,181	274,989,487
1929	154,454,056	97,861,356	58,534,834	310,850,246
By Provinces—1929—				
Nova Scotia	55,615	29,513,904	1,334,934	30,904,453
New Brunswick	.....	1,853,376	585,696	2,439,072
Quebec	13,674,236	14,262,221	18,424,828	46,358,285
Ontario	84,202,046	8,458,098	25,001,461	117,662,505
Manitoba	465,587	666,841	4,291,397	5,423,825
Saskatchewan	.....	1,063,338	1,190,168	2,253,506
Alberta	103	31,074,562	3,665,321	34,739,986
British Columbia	53,154,681	10,967,168	4,041,029	68,162,878
Yukon Territory	2,903,888	1,848	.....	2,905,736
Canada	**154,454,056**	**97,861,356**	**58,534,834**	**310,850,246**

(a) Total includes $300,000 allowed for products not reported.

Table 10.—Values of the Mineral Production of Canada by Provinces, 1899-1929

Year	Nova Scotia*	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Yukon
	$	$	$	$	$	$	$	$	$
1899	6,817,274	420,227	2,585,635	9,819,557		17,108,707		12,482,605	Included
1900	9,298,479	439,066	3,292,383	11,258,099		23,452,330		16,680,526	with
1901	7,770,159	467,985	3,759,984	13,970,010		19,297,940		20,531,833	Mani-
1902	10,686,549	607,129	3,743,636	14,619,091		16,127,400		17,448,031	toba,
1903	11,431,914	580,495	3,585,938	14,160,033		14,082,986		17,899,147	Saskat-
1904	11,212,746	559,913	3,688,482	12,582,843		12,713,613		19,325,174	chewan
1905	11,507,047	559,035	4,405,975	18,833,292		11,387,642		22,386,008	and
1906	12,894,303	646,328	5,242,058	25,111,682		10,092,726		25,299,600	Alberta
1907	14,532,040	664,467	6,205,553	30,381,638	898,775	533,251	4,657,524	25,656,056	3,335,898
1908	14,487,108	579,816	6,372,949	30,623,812	584,374	413,212	5,122,505	23,704,035	3,669,290
1909	12,504,810	657,035	7,086,205	37,374,577	1,193,377	456,246	6,047,447	22,479,006	4,032,678
1910	14,195,730	581,942	8,270,136	43,538,078	1,500,359	498,122	8,996,210	24,478,572	4,764,474
1911	15,409,397	612,830	9,304,717	42,796,162	1,794,772	636,706	6,662,673	21,299,305	4,707,432
1912	18,922,236	771,004	11,656,998	51,985,876	2,463,074	1,165,642	12,073,589	30,076,635	5,933,242
1913	19,376,183	1,102,613	13,475,534	59,167,749	2,214,496	881,142	15,054,046	28,086,312	6,276,737
1914	17,584,639	1,014,570	11,836,929	53,034,677	2,413,489	712,313	12,684,234	24,164,039	5,418,185
1915	18,088,342	903,467	11,619,275	61,071,287	1,318,387	451,933	9,909,347	28,689,425	5,057,708
1916	20,042,262	1,118,187	14,406,598	80,461,323	1,823,576	590,473	13,297,543	39,969,962	5,491,610
1917	21,104,542	1,435,024	17,400,077	89,066,609	2,628,264	860,651	16,527,535	36,141,926	4,482,202
1918	22,317,108	2,144,017	19,605,347	94,694,093	3,120,600	1,019,781	23,109,987	42,935,333	2,355,631
1919	23,445,215	1,770,945	21,267,947	67,917,998	2,868,378	1,521,964	21,087,582	34,865,427	1,940,934
1920	34,130,017	2,491,787	28,886,214	81,715,808	4,223,461	1,837,468	33,586,456	39,411,728	1,576,726
1921	28,912,111	1,901,505	15,157,094	57,356,651	1,934,117	1,114,220	30,562,229	33,230,460	1,754,955
1922	25,923,499	2,263,692	17,647,939	65,886,029	2,258,942	1,255,470	27,872,136	39,423,962	1,785,573
1923	29,648,893	2,462,457	20,308,763	80,825,851	1,768,037	1,047,583	31,287,536	43,757,388	2,972,823
1924	23,820,352	1,969,260	19,136,501	86,398,656	1,534,249	1,128,100	22,344,940	52,298,533	952,812
1925	17,625,612	1,743,858	24,284,527	87,980,436	2,276,759	1,076,392	25,318,866	64,485,242	1,791,641
1926	28,873,792	1,811,104	25,956,103	84,702,296	3,073,528	1,193,394	26,977,027	65,622,976	2,226,813
1927	30,111,221	2,148,535	28,870,403	89,982,962	2,888,912	1,455,225	29,309,223	60,801,170	1,789,044
1928	30,524,392	2,198,919	37,037,420	99,584,718	4,186,853	1,719,461	32,531,416	64,496,351	2,709,957
1929	30,904,453	2,439,072	46,358,285	117,662,505	5,423,825	2,253,506	34,739,986	68,162,878	2,905,736

*Includes a small production from Prince Edward Island.

Table 11.—Percentage of the Total Value of the Mineral Production of Canada Produced by Each Province, 1925-1929

Province	1925	1926	1927	1928	1929
Nova Scotia*	7·78	12·01	12·17	11·10	9·94
New Brunswick	0·77	0·75	0·87	0·80	0·79
Quebec	10·72	10·79	11·67	13·47	14·93
Ontario	38·82	35·23	36·38	36·22	37·85
Manitoba	1·01	1·28	1·17	1·52	1·75
Saskatchewan	0·48	0·50	0·59	0·63	0·72
Alberta	11·17	11·22	11·85	11·83	11·17
British Columbia	28·46	27·29	24·58	23·45	21·92
Yukon	0·79	0·93	0·72	0·98	0·93
Canada	**100·00**	**100·00**	**100·00**	**100·00**	**100·00**

*Includes a small percentage from Prince Edward Island.

Table 12.—Mineral Production of Nova Scotia, 1927-1929

Product		1927		1928		1929	
		Quantity	Value	Quantity	Value	Quantity	Value
			$		$		$
METALLICS—							
Arsenic	lb.	35,000	700	.....	.....	.....	.....
Gold	fine oz.	3,151	65,137	1,290	26,667	2,687	55,545
Silver	fine oz.	125	70	77	45	132	70
NON-METALLICS—							
Barytes	tons	56	1,268	127	2,847	105	2,341
Coal	tons	7,071,876	27,194,671	6,743,504	27,427,556	7,056,133	23,071,956
Diatomite	tons	266	6,650	208	4,160	254	5,080
Grindstones	tons	11	220	.....	.....	6	110
Gypsum	tons	829,438	1,512,015	1,013,257	1,850,243	948,895	1,152,160
Quartz	tons	4,834	16,721	7,424	28,022	11,845	31,388
Salt	tons	14,391	102,590	19,604	118,342	27,819	157,662
Silica brick	M	1,238	50,978	1,627	69,179	2,385	93,207
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—							
Clay products		.....	416,417	.....	496,577	.....	653,157
Lime	tons	30,562	100,254	36,154	175,876	42,001	154,187
Sand and gravel	tons	812,976	522,723	296,266	111,103	332,599	151,368
Stone	tons	72,451	120,807	121,168	213,775	264,706	376,222
Total		.....	**30,111,221**	.....	**30,524,392**	.....	**30,904,453**

Table 13.—Mineral Production of New Brunswick, 1927-1929

Product	1927		1928		1929	
	Quantity	Value	Quantity	Value	Quantity	Value
		$		$		$
METALLICS—						
Antimony ... tons	...	...	...	...	...	...
Manganese ore ... tons	...	...	...	...	...	...
NON-METALLICS—						
Coal ... tons	203,950	885,038	207,738	869,104	218,706	909,169
Grindstones ... tons	1,860	97,197	1,609	80,451	1,731	103,514
Gypsum ... tons	85,293	524,550	75,033	501,252	70,482	485,982
Manganese, Bog ... tons	...	...	385	2,237	300	1,800
Natural gas ... M cu. ft.	630,755	124,637	660,981	324,344	678,456	333,002
Petroleum ... brl	18,244	41,748	8,043	21,391	7,499	19,909
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Clay products ...	...	87,185	...	72,192	...	160,006
Lime ... tons	12,009	148,321	11,261	130,784	15,518	174,553
Sand and gravel ... tons	388,066	118,768	491,471	54,183	525,857	46,167
Stone ... tons	29,908	121,091	46,332	142,981	27,352	204,970
Total ...	...	**2,148,535**	...	**2,198,919**	...	**2,439,072**

Table 14.—Mineral Production of *Quebec, 1927-1929

Product	1927		1928		1929	
	Quantity	Value	Quantity	Value	Quantity	Value
		$		$		$
METALLICS—						
Copper ... lb.	3,119,848	403,084	33,697,949	4,909,791	55,337,169	10,019,901
Gold ... fine oz.	8,331	172,217	60,006	1,240,434	90,798	1,876,961
Iron ore, sold for export ... tons	2,029	8,980	2,244	6,732	2,748	7,359
Lead ... lb.	6,496,577	341,461	6,218,336	284,520	5,358,304	270,616
Molybdenite ... lb. (MoS_2)	...	...	...	...	16,150	6,400
Silver ... fine oz.	740,864	417,625	908,959	528,796	813,821	431,208
Zinc ... lb.	17,189,046	1,064,690	21,057,760	1,156,745	19,653,440	1,058,731
NON-METALLICS—						
Asbestos ... tons	274,778	10,621,013	273,033	11,238,360	306,055	13,172,581
Feldspar ... tons	12,730	104,618	12,943	104,789	15,790	133,492
Garnets ... tons	2	150	...	...	...	...
Graphite ... tons	34	2,043	50	4,668	173	12,652
Iron oxides ... tons	5,931	102,186	5,278	109,383	6,220	113,932
Magnesite ... tons	7,337	230,309	13,195	346,996	18,809	491,170
Mica ... tons	1,454	99,194	1,101	54,224	1,002	72,630
Mineral water ... Imp. gal.	10,330	1,813	15,415	5,608	12,205	2,488
Peat ... tons	...	...	...	...	1,6[illegible]7	8,829
Phosphate ... tons	31	399	91	1,126	40	800
Pyrites ... tons	13,021	42,795	†1,552	12,061	† 9,926	73,119
Quartz ... tons	49,141	132,615	64,577	143,067	46,444	132,532
Talc and soapstone ... tons	1,276	51,504	...	40,171	...	47,986
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Cement ... brl.	4,636,751	5,383,058	4,913,820	6,305,399	5,169,408	7,120,374
Clay products ...	...	2,734,738	...	3,097,295	...	3,187,702
Lime—						
Quicklime ... tons	97,078	725,876	102,859	795,999	157,714	1,183,148
Hydrated lime ... tons	10,576	80,789	11,271	100,783	9,478	81,046
Sand and gravel ... tons	8,615,738	1,880,931	8,136,341	1,701,282	6,203,231	1,534,699
Stone ... tons	2,534,531	4,268,315	2,992,192	4,849,200	3,484,471	5,317,859
Total ...	...	**28,870,403**	...	**37,037,420**	...	**46,358,285**

* There is also in this province an important production of aluminium from imported ores.
†Sulphur content of pyrites.

Table 15.—Mineral Production of *Ontario, 1927-1929

Product		1927		1928		1929	
		Quantity	Value	Quantity	Value	Quantity	Value
			$		$		$
Metallics—							
Antimony	lb.	.....	.....	.....	.....	.....	.....
Arsenic (As_2O_3)	lb.	4,961,178	197,668	4,097,226	178,149	3,742,913	154,887
Bismuth	lb.	2,072	1,003	14,002	5,067	27,446	23,413
Cobalt	lb.	880,590	1,764,534	954,860	1,671,000	929,415	1,801,915
Copper	lb.	45,341,295	4,946,533	66,607,510	8,770,149	88,879,853	14,622,572
Gold	fine oz.	1,627,050	33,634,108	1,578,434	32,629,126	1,622,267	33,535,234
Iron pig from Canadian ore	tons	.....	.....	.....	.....	.....	.....
Lead	lb.	7,990,709	528,729	6,814,757	402,289	4,769,506	294,431
Nickel	lb.	66,798,717	15,262,171	96,755,578	22,318,907	110,275,912	27,115,461
Palladium	fine oz.	11,545	554,190	13,087	605,563	17,141	802,453
Platinum	fine oz.	11,217	716,653	10,452	704,360	12,474	813,928
Silver	fine oz.	9,307,953	5,246,893	7,242,601	4,213,456	8,890,726	4,711,462
Zinc	lb.	.....	.....	58,724	3,226	5,516,806	297,190
Non-Metallics—							
Actinolite	tons	86	1,075	70	875	30	375
Asbestos	tons	.....	.....	.....	.....	.....	.....
Beryl Crystals	lb.	.....	.....	.....	.....	4,456	114
Feldspar	tons	17,119	154,533	18,954	180,153	21,737	206,979
Fluorspar	tons	.....	.....	.....	.....	70	1,120
Garnets	tons	.....	.....	.....	.....	.....	.....
Graphite	tons	1,795	109,613	1,047	52,373	1,288	90,522
Grinding pebbles	tons	.....	.....	.....	.....	.....	.....
Gypsum	tons	83,998	500,688	85,811	553,271	100,347	832,689
Mica	tons	1,284	75,183	2,559	32,944	2,991	45,919
Mineral water	Imp.gal	293,200	12,811	253,630	27,890	309,700	13,651
Natural gas	M cu. ft.	7,311,215	4,331,780	7,632,800	4,535,312	8,586,475	4,959,695
Peat	tons	.....	.....	1,497	5,845	1,000	4,500
Petroleum	brl.	139,606	288,347	134,094	249,737	121,194	253,678
Phosphate	tons	82	824	.....	.....	.....	.....
Pyrites	tons	463	6,077	†4,974	54,100	† 4,579	51,516
Quartz	tons	159,150	266,204	194,503	308,608	187,973	316,050
Salt	tons	254,181	1,510,777	279,841	1,377,629	302,445	1,420,424
Silica brick	M	553	28,549	1,597	86,323	1,566	80,374
Talc and soapstone	tons	15,138	181,981	14,925	179,187	15,463	180,492
Clay Products and Other Structural Materials—							
Cement	brl.	3,751,786	5,144,326	3,911,795	5,520,897	4,624,712	6,608,246
Clay products		.....	5,853,035	.....	6,177,664	.....	6,830,162
Lime—							
Quicklime	tons	198,383	1,657,552	228,101	1,870,476	314,243	2,624,284
Hydrated	tons	44,749	540,687	49,085	597,367	55,915	740,127
Sand and gravel	tons	7,512,763	2,405,729	10,389,408	2,230,307	11,358,568	3,462,379
Stone	tons	4,254,960	4,060,709	4,581,929	4,041,568	5,239,672	4,736,263
Total		.....	**89,982,962**	.....	**99,584,718**	.....	**117,662,505**

* The total production of blast-furnace pig-iron in Ontario in 1927 was 406,148 long tons valued at $9,202,960; in 1928 it was 734,971 long tons valued at $14,427,481; and in 1929 it was 769,359 long tons valued at $15,387,180.

† Sulphur content of pyrites at its sales value and estimated figures for quantity and value of sulphur in smelter gases used for acid making.

Table 16.—Mineral Production of Manitoba, 1927-1929

Product		1927		1928		1929	
		Quantity	Value	Quantity	Value	Quantity	Value
			$		$		$
Metallics—							
Gold	fine oz.	182	3,762	19,813	409,571	22,455	464,186
Silver	fine oz.	12	7	1,763	1,026	2,644	1,401
Non-Metallics—							
Gypsum	tons	39,895	512,008	51,285	609,039	67,209	631,051
Natural gas	M cu. ft.	200	60	200	60	600	180
Quartz	tons	.....	.....	*1	360	10,045	35,610
Clay Products and Other Structural Materials—							
Cement	brl.	551,698	1,378,121	693,450	1,685,084	1,000,258	2,350,606
Clay products		.....	201,464	.....	291,791	.....	362,240
Lime	tons	22,714	246,279	28,337	319,699	32,246	361,104
Sand and gravel	tons	1,333,580	228,655	1,653,929	262,006	1,782,085	322,430
Stone	tons	154,666	318,556	235,864	608,217	192,109	895,017
Total		.....	**2,888,912**	.....	**4,186,853**	.....	**5,423,825**

* Rose quartz.

Table 17.—Mineral Production of Saskatchewan, 1927-1929

Product	1927		1928		1929	
	Quantity	Value	Quantity	Value	Quantity	Value
		$		$		$
NON-METALLICS—						
Coal ..... tons	470,216	868,867	471,713	831,491	589,189	993,226
Sodium sulphate ..... tons	5,659	11,319	6,016	68,804	5,018	64,112
Volcanic dust ..... tons	105	735	485	9,795	300	6,000
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Clay products	.....	311,204	.....	377,896	.....	502,522
Sand and gravel ..... tons	1,517,801	263,100	2,225,524	431,475	3,496,679	687,646
Total	.....	**1,455,225**	.....	**1,719,461**	.....	**2,253,506**

Table 18.—Mineral Production of Alberta, 1927-1929

Product	1927		1928		1929	
	Quantity	Value	Quantity	Value	Quantity	Value
		$		$		$
METALLICS—						
Gold ..... fine oz.	42	868	68	1,406	5	103
Silver ..... fine oz.	4	3	7	4	.....	.....
NON-METALLICS—						
Bituminous sands ..... tons	2,706	10,824	94	374	989	3,956
Coal ..... tons	6,934,162	21,982,058	7,336,330	23,532,414	7,150,693	22,928,182
Natural gas ..... M cu. ft.	13,434,621	3,586,533	14,288,605	3,754,466	19,112,931	4,684,247
Petroleum ..... brl.	318,741	1,185,948	482,047	1,764,172	988,675	3,458,177
Salt ..... tons	100	1,300	.....	.....	.....	.....
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Cement ..... brl.	601,699	1,303,880	834,067	1,732,582	808,796	1,770,786
Clay products	.....	889,358	.....	1,162,264	.....	1,342,427
Lime ..... tons	4,570	46,947	6,672	69,588	7,681	79,569
Sand and gravel ..... tons	1,392,752	293,674	2,575,708	489,406	1,721,930	447,993
Stone ..... tons	3,367	7,830	5,010	24,740	5,183	24,546
Total	.....	**29,309,222**	.....	**32,531,416**	.....	**34,739,986**

Table 19.—Mineral Production of British Columbia, 1927-1929

Product		1927		1928		1929	
		Quantity	Value	Quantity	Value	Quantity	Value
			$		$		$
Metallics—							
Arsenic	lb.	1,231,790	13,611	1,334,997	14,903	1,487,175	16,433
Bismith	lb.	.....	.....	.....	.....	166,883	283,701
Cadmium	lb.	.....	.....	491,894	341,374	773,976	675,294
Chromite	tons	.....	.....	.....	.....	126	900
Cobalt	lb.	.....	.....	1,730	420	.....	.....
Copper	lb.	91,686,297	11,845,870	102,283,210	14,902,664	103,903,738	18,772,778
Gold	fine oz	183,094	3,784,889	196,617	4,064,434	154,204	3,187,689
Lead	lb.	292,770,544	15,388,020	317,722,146	14,537,377	307,999,153	15,555,189
Palladium, Rhodium, etc	fine oz.	.....	.....	520	22,270	177	6,836
Platinum	fine oz.	11	960	80	4,549	45	2,828
Silver	fine oz.	11,040,445	6,223,499	10,943,367	6,366,413	10,156,408	5,382,185
Zinc	lb.	148,306,479	9,186,103	163,530,890	8,983,079	172,096,841	9,270,857
Non-Metallics—							
Coal	tons	2,746,243	10,934,777	2,804,594	11,094,353	2,490,378	10,160,789
Diatomite	tons	.....	.....	160	4,800	175	5,250
Fluorspar	tons	.....	.....	.....	.....	17,800	267,000
Grindstones, pulpstones	tons	380	27,600	246	20,509	210	2,730
Gypsum	tons	24,493	201,754	20,982	229,843	24,696	243,814
Iron oxides	tons	194	1,350	136	1,815	298	2,000
Manganese, bog	tons	.....	.....	.....	.....	1	30
Natro-alunite	tons	7	248	.....	.....	.....	.....
Phosphate	tons	38	494	550	7,150	1,145	4,580
Pyrites	tons	37,379	149,516	*32,063	254,872	* 28,276	226,208
Quartz	tons	20,859	80,824	16,017	43,876	9,642	45,947
Sodium carbonate	tons	805	9,995	519	4,922	600	8,100
Talc	tons	107	2,620	.....	.....	46	720
Clay Products and Other Structural Materials—							
Cement	brl.	523,931	1,182,552	670,796	1,495,204	680,907	1,487,223
Clay products		.....	679,788	.....	706,039	.....	866,427
Lime—							
Quicklime	tons	16,175	279,230	24,512	345,131	26,300	355,013
Hydrated	tons	7,936	97,453	10,637	128,865	13,201	155,579
Sand and gravel	tons	1,379,143	342,021	2,334,270	529,669	2,425,996	665,132
Stone	tons	256,553	367,996	271,439	391,820	408,931	511,655
Total		.....	**60,801,170**	.....	**64,496,351**	.....	**68,162,878**

*Sulphur content.

Table 20.—Mineral Production of the Yukon, 1927-1929

Product		1927		1928		1929	
		Quantity	Value	Quantity	Value	Quantity	Value
			$		$		$
Metallics—							
Copper	lb.	.....	.....	107,377	15,645	.....	.....
Gold	fine oz.	30,935	639,483	34,364	710,367	35,892	741,954
Lead	lb.	4,165,331	218,929	7,191,449	329,045	8,395,603	424,012
Silver	fine oz.	1,647,295	928,580	2,839,633	1,651,985	3,279,530	1,737,922
Non-Metallics—							
Coal	tons	414	2,052	414	2,915	458	1,848
Total		.....	**1,789,044**	.....	**2,709,957**	.....	**2,905,736**

Table 21.—Principal Statistics of the Mineral Industry in Canada by Industries, 1925-1929

Year.	Number of active operators	Number of operating plants or mines	Capital employed $	Number of employees	Salaries and wages $	Cost of fuel and electricity $	Net value of bullion, ore, concentrates, residues and other minerals shipped from the mines, smelters, brick and cement plants and quarries $
Metal Mining Industry							
ALLUVIAL GOLD							
1925	99	1,419	22,095,639	363	347,448	.....	1,270,419
1926	108	1,179	4,702,808	285	339,841	44,482	879,886
1927	94	96	9,653,723	321	472,596	30,834	794,033
1928	82	82	10,384,575	342	538,270	57,178	852,735
1929	68	68	7,237,850	488	586,193	2,969	836,006
AURIFEROUS QUARTZ							
1925	52	52	84,964,062	7,052	11,931,948	1,836,050	35,035,361
1926	60	60	103,945,022	7,663	12,340,623	2,083,811	35,171,561
1927	72	76	118,381,468	8,022	12,935,719	2,222,085	37,452,995
1928	98	100	147,693,710	9,066	14,615,990	2,554,657	36,655,330
1929	80	85	135,166,105	8,660	14,258,733	2,579,481	37,275,986
COPPER-GOLD-SILVER							
1925	40	41	23,200,580	2,374	3,555,844	413,767	7,758,990
1926	76	84	27,936,685	3,403	4,546,493	541,914	9,973,049
1927	118	125	24,232,169	4,083	5,260,095	596,137	9,822,881
1928	164	174	50,004,340	4,777	6,764,309	731,836	15,281,519
1929	144	152	52,546,697	5,243	8,498,755	1,035,133	21,859,907
SILVER-COBALT							
1925	33	38	44,045,019	1,788	2,576,414	498,874	6,611,644
1926	33	37	40,504,721	1,779	2,815,930	518,907	5,470,433
1927	23	26	30,123,645	1,458	2,178,163	472,548	4,790,546
1928	15	19	22,027,683	1,166	1,809,466	430,683	3,938,884
1929	27	32	15,820,435	1,149	1,532,333	407,952	3,918,316
SILVER-LEAD-ZINC							
1925	89	94	15,735,930	2,538	3,867,613	584,121	21,902,686
1926	108	127	22,699,417	2,924	4,431,730	658,679	20,190,034
1927	157	173	28,036,330	3,106	4,807,817	588,520	17,520,130
1928	132	150	38,894,892	3,680	5,531,634	671,564	17,123,455
1929	149	168	50,573,661	4,153	6,482,392	793,139	22,748,089
NICKEL-COPPER							
1925	2	6	38,691,594	1,412	1,867,217	105,570	3,794,244
1926	2	6	38,593,359	1,437	1,963,617	95,621	4,627,175
1927	2	6	39,272,609	1,617	2,486,313	120,686	5,223,668
1928	4	8	45,659,704	1,963	3,136,838	121,005	5,831,640
1929	2	5	19,448,290	3,219	5,105,875	184,363	7,967,640
MISCELLANEOUS							
1925	3	3	109,583	33	17,301	2,007	23,110
1926	2	2	87,588	25	10,626	3,844	11,072
1927	5	5	641,600	65	23,944	460	8,980
1928	5	5	627,000	62	61,886	8,880	6,732
1929	8	8	6,050	94	42,837	10,217	6,400
NON-FERROUS METAL SMELTING AND REFINING							
1925	5	6	61,691,928	5,104	8,568,997	5,280,674	*29,304,384
1926	7	9	81,779,240	6,226	9,584,938	6,076,627	*33,615,909
1927	8	10	85,366,662	7,671	12,120,240	6,380,127	*45,479,578
1928	8	10	120,035,742	7,526	12,228,738	5,180,770	*61,080,477
1929	7	10	146,699,085	8,119	13,772,393	6,208,733	*68,438,022

* Value added by smelting.

Table 22.—Principal Statistics of the Mineral Industry in Canada by Industries, 1925-1929—Continued

Year.	Number of active operators	Number of operating plants or mines	Capital employed $	Number of employees	Salaries and wages $	Cost of fuel and electricity $	Net value of bullion, ore, concentrates, residues and other minerals shipped from the mines, smelters, brick and cement plants and quarries $
Total Metal Mining Industries							
1925	323	1,659	290,531,965	20,664	32,732,782	8,721,063	105,700,838
1926	396	1,504	320,248,840	23,742	36,033,798	10,023,885	115,939,119
1927	479	517	335,708,206	26,313	46,284,887	10,411,397	121,062,811
1928	508	548	435,327,646	28,582	44,687,131	9,756,553	140,770,772
1929	485	528	427,498,173	31,125	50,279,511	11,221,987	163,050,366
Non-Metal Mining Industries including Fuels							
(b) FUELS							
Coal							
1925	450	511	145,006,440	25,032	33,200,309	4,069,634	46,835,788
1926	433	457	148,278,315	28,368	35,841,796	4,631,691	56,494,375
1927	385	437	146,392,808	29,772	38,955,967	3,558,926	58,439,742
1928	380	427	146,835,825	30,256	43,320,811	3,679,721	60,462,687
1929	357	413	141,766,727	29,739	42,376,378	3,657,355	59,584,545
Natural Gas							
1925	164	2,236	48,895,802	1,059	1,206,875	13,396	6,588,424
1926	169	2,255	57,231,261	1,254	1,448,778	40,444	7,350,170
1927	172	2,293	56,777,091	1,342	1,535,498	11,181	7,689,916
1928	155	2,073	62,073,384	1,660	2,105,648	34,396	7,216,054
1929	145	2,298	68,592,709	1,953	2,275,147	41,590	8,555,971
Petroleum							
1925	180	2,885	7,954,722	259	318,101	20,990	1,250,705
1926	210	2,822	17,639,142	634	788,843	77,902	1,311,665
1927	206	2,734	22,773,916	781	1,120,224	112,763	1,516,043
1928	190	2,763	31,182,352	1,118	1,916,625	205,183	2,807,528
1929	231	2,635	54,526,398	2,221	3,748,689	293,354	4,368,374
TOTAL FUELS							
1925	791	5,632	201,856,964	26,350	34,725,285	4,104,020	54,674,917
1926	812	5,534	223,148,718	30,256	38,079,417	4,750,037	65,156,210
1927	763	5,461	225,943,815	31,895	41,611,689	3,682,870	67,645,701
1928	725	5,263	240,091,561	33,034	47,343,084	3,919,300	70,486,269
1929	733	5,346	264,885,834	33,913	48,400,214	3,992,299	72,508,890
OTHER NON-METAL MINING INDUSTRIES							
Abrasives							
1925	8	8	154,733	62	55,466	5,408	126,490
1926	8	8	358,342	102	90,069	9,716	152,433
1927	9	9	433,810	132	107,603	10,279	132,552
1928	9	9	448,618	163	96,558	12,908	119,715
1929	9	9	790,791	154	152,805	18,942	122,684
Asbestos							
1925	14	19	38,133,046	2,582	2,997,107	923,239	8,988,360
1926	8	16	34,905,096	2,797	3,544,097	1,012,232	10,099,423
1927	7	13	35,316,821	2,976	3,761,192	1,046,541	10,621,013
1928	7	14	35,705,212	3,170	3,989,644	1,177,715	11,238,360
1929	7	8	33,248,957	3,391	4,410,535	1,335,610	13,172,581

Table 23.—Principal Statistics of the Mineral Industry in Canada, by Industries, 1925-1929—Continued

Year.	Number of active operators	Number of operating plants or mines	Capital employed $	Number of employees	Salaries and wages $	Cost of fuel and electricity $	Net value of bullion, ore, concentrates, residues and other minerals shipped from the mines, smelters, brick and cement plants and quarries $
OTHER NON-METAL MINING INDUSTRIES—Continued							
FELDSPAR							
1925	23	25	712,329	240	165,766	11,141	235,789
1926	29	30	582,350	410	213,571	14,654	310,238
1927	29	29	322,978	234	151,553	10,232	259,151
1928	20	21	237,400	223	144,660	12,898	284,942
1929	19	20	223,443	209	164,440	14,122	340,471
GRAPHITE							
1925	6	6	902,310	106	75,021	14,718	158,763
1926	3	3	1,132,273	68	63,064	10,804	194,860
1927	.....	.....	Included with	Miscellaneous			
1928	.....	.....	"	"			
1929	.....	.....	"	"			
GYPSUM							
1925	15	16	4,506,995	1,039	1,918,585	189,649	2,389,891
1926	18	19	6,696,077	1,368	1,255,427	241,414	2,770,813
1927	19	23	9,055,624	1,427	1,311,688	198,199	3,251,015
1928	16	22	8,035,319	1,159	1,171,814	242,260	3,743,648
1929	17	22	7,438,605	987	1,054,213	281,019	3,345,696
IRON OXIDES							
1925	5	5	173,940	47	35,454	16,073	91,913
1926	5	5	178,078	46	38,348	17,576	101,843
1927	5	5	153,317	48	38,630	18,222	103,536
1928	5	5	154,251	45	38,834	18,666	111,198
1929	4	4	159,523	48	47,324	13,564	115,932
MICA							
1925	36	36	190,144	269	123,079	4,528	261,463
1926	22	22	186,478	208	128,269	5,353	229,204
1927	21	21	322,389	168	118,505	4,400	174,377
1928	16	16	260,074	94	42,159	1,966	87,168
1929	14	14	281,295	83	47,362	355	118,549
QUARTZ							
1925	14	15	1,005,159	153	145,494	20,495	363,612
1926	17	18	1,056,705	243	208,839	44,311	553,161
1927	19	20	963,216	267	271,555	34,423	496,364
1928	17	18	1,159,085	258	222,672	35,948	523,933
1929	19	20	1,000,232	279	189,451	27,340	561,527
SALT							
1925	12	13	2,563,508	402	467,487	315,368	1,410,697
1926	11	12	2,782,728	384	482,651	324,612	1,480,149
1927	10	11	3,194,802	376	499,967	287,260	1,614,667
1928	9	10	4,422,922	455	539,775	252,468	1,495,971
1929	8	8	4,576,543	424	516,453	249,664	1,578,086
TALC AND SOAPSTONE							
1925	7	7	744,037	92	74,519	22,218	205,835
1926	6	6	681,434	92	74,634	25,023	217,195
1927	8	9	715,439	122	87,721	25,169	236,105
1928	5	5	732,608	91	85,161	21,850	219,358
1929	5	5	654,635	86	74,300	21,395	229,198

Table 24.—Principal Statistics of the Mineral Industry in Canada by Industries, 1925-1929—Continued

Year.	Number of active operators	Number of operating plants or mines	Capital employed $	Number of employees	Salaries and wages $	Cost of fuel and electricity $	Net value of bullion, ore, concentrates, residues and other minerals shipped from the mines, smelters, brick and cement plants and quarries $
OTHER NON-METAL MINING INDUSTRIES—Concluded							
Miscellaneous							
1925	28	28	2,080,481	218	149,655	58,437	273,327
1926	28	28	2,400,850	193	201,468	79,877	386,892
1927	32	32	3,315,380	304	313,338	85,302	670,950
1928	33	33	4,478,481	394	414,650	128,029	1,002,399
1929	38	38	4,042,638	506	545,216	79,463	1,502,574
TOTAL OTHER NON-METAL MINING INDUSTRIES							
1925	*168*	*178*	*51,166,682*	*5,210*	*5,307,653*	*1,581,274*	*14,506,140*
1926	*155*	*167*	*50,960,411*	*5,910*	*6,300,437*	*1,785,572*	*16,496,211*
1927	*159*	*172*	*53,793,776*	*6,054*	*6,661,802*	*1,720,027*	*17,559,730*
1928	*137*	*153*	*55,633,970*	*6,052*	*6,745,927*	*1,904,798*	*18,826,692*
1929	*140*	*148*	*52,416,662*	*6,167*	*7,202,099*	*2,041,474*	*21,087,298*
Total Non-Metal Mining Industries Including Fuels							
1925	**959**	**5,810**	**253,023,646**	**31,560**	**40,032,918**	**5,685,294**	**69,181,057**
1926	**967**	**5,701**	**274,109,129**	**36,166**	**44,379,854**	**6,535,609**	**81,652,421**
1927	**922**	**5,633**	**279,737,591**	**37,919**	**48,273,491**	**5,402,897**	**85,205,431**
1928	**862**	**5,416**	**295,725,531**	**39,086**	**54,089,011**	**5,824,098**	**89,312,961**
1929	**873**	**5,494**	**317,302,196**	**40,080**	**55,602,313**	**6,033,773**	**93,596,188**
Clay Products and Other Structural Materials							
Brick and Tile							
1925	168	173	22,410,450	3,403	3,107,926	1,565,341	7,374,551
1926	178	184	23,034,976	3,644	3,408,052	1,761,516	8,146,514
1927	167	176	24,795,253	3,977	3,828,106	1,786,684	8,995,741
1928	160	169	26,083,741	4,388	4,353,970	1,985,363	9,853,720
1929	173	181	27,503,688	4,740	4,694,434	2,605,532	11,068,520
Clay Sewer Pipe							
1925	5	5	2,810,782	382	461,527	240,038	1,182,454
1926	5	5	3,028,076	407	497,512	227,456	1,177,247
1927	5	5	3,246,183	421	506,730	214,088	1,137,284
1928	5	5	3,746,491	415	511,977	217,003	1,208,029
1929	3	5	3,694,716	391	495,666	216,462	1,478,071
Firebrick and Other Clay Products							
1925	6	6	2,114,738	220	274,919	88,552	702,707
1926	5	5	1,780,967	188	249,471	75,544	706,984
1927	5	5	2,009,449	199	263,910	71,789	715,608
1928	5	5	2,241,716	221	333,628	76,055	891,266
1929	5	5	2,295,498	235	351,352	80,875	1,022,055
Stoneware and Pottery							
1925	4	4	424,894	131	129,703	15,660	269,979
1926	4	4	310,043	149	130,254	15,538	322,726
1927	5	5	359,918	152	50,965	12,956	311,085
1928	4	4	401,255	161	175,087	15,929	359,562
1929	4	4	696,154	155	177,620	17,515	326,408
*TOTAL CLAY PRODUCTS**							
1925	*183*	*188*	*27,760,864*	*4,136*	*4,054,075*	*1,909,591*	*9,529,691*
1926	*194*	*200*	*28,152,062*	*4,396*	*4,346,687*	*2,080,054*	*10,357,323*
1927	*185*	*194*	*30,437,607*	*4,776*	*4,769,307*	*2,088,724*	*11,173,189*
1928	*177*	*186*	*32,473,203*	*5,195*	*5,181,398*	*2,294,350*	*12,381,718*
1929	*186*	*196*	*34,190,056*	*5,530*	*5,727,014*	*2,920,384*	*13,904,643*

*Includes kaolin and other clays.

Table 25.—Principal Statistics of the Mineral Industry in Canada by Industries, 1925-1929—Concluded

Year	Number of active operators	Number of operating plants or mines	Capital employed $	Number of employees	Salaries and wages $	Cost of fuel and electricity $	Net value of bullion, ore, concentrates, residues and other minerals shipped from the mines, smelters, brick and cement plants and quarries $
OTHER STRUCTURAL MATERIALS							
CEMENT							
1925	7	11	38,081,583	1,926	2,511,400	2,848,904	14,046,704
1926	7	12	41,380,000	2,340	3,052,662	3,424,156	13,013,283
1927	6	12	40,509,319	2,270	3,143,932	3,546,000	14,391,937
1928	5	11	47,678,841	2,407	3,405,385	3,872,108	16,739,163
1929	8	11	50,881,818	2,546	3,523,595	4,347,219	19,337,235
LIME							
1925	56	62	5,154,046	1,006	960,434	762,814	3,387,652
1926	54	60	5,825,809	1,106	1,082,854	788,990	3,781,484
1927	53	61	6,200,481	1,132	1,133,708	826,436	3,923,388
1928	46	54	6,952,079	1,218	1,316,115	912,395	4,534,568
1929	46	53	7,404,677	1,382	1,393,092	1,183,313	5,908,610
SAND AND GRAVEL							
1925	622	622	5,286,268	1,650	1,231,856	158,645	3,220,410
1926	580	1,634	6,274,090	5,672	1,557,232	151,236	4,941,434
1927	483	2,503	7,668,812	7,133	2,043,962	188,327	6,055,601
1928	493	2,553	7,783,135	7,831	2,468,468	193,391	5,809,431
1929	541	2,598	9,154,055	8,758	2,505,225	285,491	7,317,814
STONE							
1925	201	201	12,233,773	4,148	3,599,653	479,489	7,464,777
1926	229	234	12,760,078	4,510	3,763,726	514,374	7,865,874
1927	222	258	13,810,984	5,071	4,571,605	496,503	9,265,304
1928	254	268	16,027,547	5,129	4,806,514	579,086	10,272,301
1929	247	268	20,589,758	5,681	5,459,761	759,418	12,066,532
TOTAL OTHER STRUCTURAL MATERIALS							
1925	*886*	*896*	*60,755,670*	*8,730*	*8,303,343*	*4,249,852*	*28,119,545*
1926	*870*	*1,940*	*66,239,977*	*13,628*	*9,456,474*	*4,878,756*	*29,602,075*
1927	*764*	*2,833*	*68,189,596*	*15,606*	*10,893,207*	*5,057,266*	*33,636,230*
1928	*798*	*2,886*	*78,441,602*	*16,585*	*11,996,482*	*5,556,980*	*37,355,463*
1929	*842*	*2,930*	*88,030,308*	*18,567*	*12,881,673*	*6,676,441*	*44,630,191*
Total Clay Products and Other Structural Materials							
1925	**1,069**	**1,084**	**88,516,534**	**12,866**	**12,337,418**	**6,159,443**	**37,649,234**
1926	**1,064**	**2,140**	**94,392,039**	**18,023**	**13,803,161**	**6,958,816**	**39,959,398**
1927	**949**	**3,027**	**98,627,203**	**20,382**	**15,662,514**	**7,145,990**	**41,809,419**
1928	**975**	**3,072**	**110,914,805**	**21,780**	**17,177,880**	**7,851,330**	**49,737,181**
1929	**1,028**	**3,126**	**122,220,364**	**23,897**	**18,608,687**	**9,495,825**	**58,534,834**
GRAND TOTAL OF ALL INDUSTRIES							
1925	**2,351**	**8,553**	**632,075,145**	**65,030**	**85,103,118**	**20,565,800**	**212,534,129**
1926	**2,427**	**9,345**	**688,750,008**	**77,931**	**94,216,813**	**23,518,301**	**237,550,938**
1927	**2,350**	**9,177**	**714,073,000**	**84,674**	**104,220,892**	**22,960,284**	**251,077,661**
1928	**2,345**	**9,036**	**841,967,982**	**89,448**	**115,954,022**	**23,432,001**	**279,820,914**
1929	**2,385**	**9,148**	**857,021,033**	**95,102**	**124,490,511**	**26,751,585**	**315,181,388**

(b) Production of peat for 1925-1929 included in the miscellaneous non-metallics.

Table 26.—Principal Statistics of the Mineral Industry in Canada by Provinces, 1925-1929

Year	Number of active operators	Number of operating plants or mines	Capital employed $	Number of employees	Salaries and wages $	Cost of fuel and electricity $	Net value of bullion, ore, concentrates, residues and other minerals shipped from the mines, smelters, brick and cement plants and quarries $
			*Nova Scotia				
1925	67	95	59,456,860	9,905	12,488,285	2,229,275	16,412,311
1926	72	95	60,312,087	13,993	16,109,519	2,941,725	26,702,119
1927	78	107	70,934,465	15,663	18,076,122	2,283,744	27,966,861
1928	76	104	67,329,525	15,497	21,249,053	2,391,558	28,410,600
1929	70	98	67,356,948	14,738	21,035,230	2,436,137	28,529,875
			New Brunswick				
1925	36	85	3,070,322	1,113	1,003,169	114,629	1,734,613
1926	42	91	3,533,577	1,127	952,696	143,264	1,794,836
1927	41	79	3,014,614	1,196	1,092,891	125,847	2,106,635
1928	42	97	3,331,338	1,244	1,107,462	147,154	2,153,943
1929	36	93	4,945,074	1,361	1,236,726	168,830	2,407,456
			Quebec				
1925	294	301	83,449,054	8,700	8,566,616	3,152,395	23,817,182
1926	331	1,399	112,460,615	15,555	11,912,344	4,662,165	31,629,450
1927	381	2,428	110,769,954	18,012	15,104,472	4,988,922	39,617,797
1928	402	2,418	133,350,529	17,934	15,921,744	5,953,108	48,631,311
1929	412	2,426	146,332,805	19,678	16,886,275	6,703,881	57,313,685
			Ontario				
1925	1,209	5,898	258,967,755	19,346	25,909,951	8,463,276	86,641,647
1926	1,142	5,753	278,657,190	20,060	26,987,635	8,668,666	84,710,914
1927	1,014	5,592	282,205,248	21,147	28,753,161	8,642,617	88,824,642
1928	1,022	5,390	325,844,956	23,508	31,912,123	8,343,144	99,003,578
1929	1,012	5,417	302,937,672	24,924	34,897,624	9,766,197	116,174,844
			Manitoba				
1925	25	26	4,948,621	699	711,735	315,005	2,275,772
1926	31	32	10,636,439	780	911,424	442,998	3,069,571
1927	32	33	11,780,120	1,007	1,232,805	590,225	2,888,895
1928	40	41	15,755,174	1,625	1,926,264	631,430	4,183,342
1929	43	51	18,020,285	1,819	2,375,990	992,386	5,423,628
			Saskatchewan				
1925	68	68	3,732,909	652	647,014	91,025	1,055,139
1926	73	74	5,119,845	742	708,612	111,661	1,175,139
1927	72	72	5,089,410	1,112	855,704	110,961	1,432,739
1928	77	124	5,647,417	1,229	942,150	140,577	1,686,136
1929	72	126	6,097,476	1,421	1,139,373	173,677	2,211,708
			Alberta				
1925	390	465	86,735,632	10,486	13,808,354	1,226,903	24,695,870
1926	425	473	102,875,177	10,733	14,499,210	1,380,996	26,351,728
1927	376	461	105,203,514	11,205	15,699,304	1,154,548	28,621,537
1928	362	490	118,556,978	12,358	18,022,037	1,386,358	31,569,442
1929	396	558	142,942,397	13,824	19,915,537	1,476,468	33,883,239
			British Columbia				
1925	161	193	107,257,567	13,727	21,440,904	4,801,665	54,160,830
1926	226	272	108,594,954	14,566	21,556,415	4,913,255	60,367,481
1927	282	329	114,129,277	15,031	22,714,957	4,966,446	58,019,829
1928	271	319	159,445,533	15,720	24,064,962	4,312,507	61,847,246
1929	321	355	170,575,223	16,882	26,073,143	4,943,945	66,256,597
			Yukon				
1925	101	1,422	24,456,425	462	527,090	171,627	1,737,765
1926	85	1,156	6,560,124	375	578,958	254,474	1,750,000
1927	74	76	10,946,398	301	691,476	96,974	1,598,726
1928	53	53	12,706,532	333	808,227	126,165	2,335,316
1929	24	24	7,813*153	455	930,613	90,064	2,980,356
			CANADA				
1925	**2,351**	**8,553**	**632,075,145**	**65,090**	**85,103,118**	**20,565,800**	**212,531,129**
1926	**2,427**	**9,345**	**688,750,008**	**77,931**	**91,216,813**	**23,518,301**	**237,550,938**
1927	**2,350**	**9,177**	**714,073,000**	**84,674**	**104,220,892**	**22,960,281**	**251,077,661**
1928	**2,345**	**9,036**	**841,967,982**	**89,448**	**115,954,022**	**23,432,001**	**279,820,914**
1929	**2,386**	**9,148**	**867,021,033**	**95,102**	**124,490,511**	**26,751,585**	**315,181,388**

*Includes a small production from Prince Edward Island.

Table 27.—Principal Statistics of the Mineral Industry in Canada by Main Classes and by Provinces, 1929

(a) Eastern Canada and Total for Canada

Industry	Nova Scotia	New Brunswick	Quebec	Ontario	Total for Eastern Canada	Total for Canada
METAL MINING—						
Number of firms	7	.....	121	97	225	485
Capital employed ... $	3,772,087	.....	69,929,539	202,283,509	275,985,135	427,498,173
Number of salaried employees—						
Male	17	.....	333	731	1,081	2,018
Female	1	.....	26	60	87	168
Number of wage-earners	91	.....	3,718	15,022	18,831	28,939
Total employees	109	.....	4,077	15,813	19,999	31,125
Salaries ... $	28,855	.....	714,971	2,357,779	3,101,605	5,433,603
Wages ... $	63,742	.....	4,616,620	22,914,011	27,594,373	44,845,908
Total ... $	92,597	.....	5,331,591	25,271,790	30,695,978	50,279,511
Fuel and electricity purchased ... $	10,125	.....	2,239,860	4,975,887	7,225,872	11,221,987
Net value of products shipped ... $	47,700	.....	24,626,636	83,152,184	107,826,520	163,650,366
NON-METAL MINING INCLUDING FUELS—						
Fuels						
Number of firms	16	12	.....	246	274	733
Capital employed ... $	55,805,527	3,447,926	.....	42,687,094	101,940,547	264,885,834
Number of salaried employees—						
Male	513	37	.....	388	938	2,055
Female	51	7	.....	106	164	302
Number of wage-earners	12,760	631	.....	1,009	14,400	31,556
Total employees	13,324	675	.....	1,503	15,502	33,913
Salaries ... $	1,061,401	82,493	.....	638,571	1,782,465	4,558,964
Wages ... $	18,785,513	593,407	.....	969,692	20,348,612	43,841,250
Total ... $	19,846,914	675,900	.....	1,608,263	22,131,077	48,400,214
Fuel and electricity purchased ... $	2,159,604	35,349	.....	48,583	2,243,536	3,992,299
Net value of products shipped ... $	25,705,293	1,230,464	.....	4,776,474	31,712,231	72,508,890
Other Non-Metal Mining—						
Number of firms	15	5	50	44	114	140
Capital employed ... $	5,548,457	942,040	36,646,113	6,586,535	49,723,145	52,416,662
Number of salaried employees—						
Male	28	14	213	71	326	369
Female	6	4	30	16	56	63
Number of wage-earners	616	282	3,718	723	5,339	5,735
Total employees	650	300	3,961	810	5,721	6,167
Salaries ... $	75,516	62,732	489,888	163,120	791,256	887,549
Wages ... $	518,408	221,467	4,421,298	723,810	5,884,983	6,314,550
Total ... $	593,924	284,199	4,911,186	886,930	6,676,239	7,202,099
Fuel and electricity purchased ... $	140,700	53,259	1,379,280	345,005	1,918,244	2,041,474
Net value of products shipped ... $	1,441,948	591,296	14,262,221	3,244,725	19,540,190	21,087,298
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Number of firms	32	19	241	625	917	1,028
Capital employed ... $	2,230,877	555,108	39,757,153	51,380,534	93,923,672	122,220,364
Number of salaried employees—						
Male	23	23	305	414	765	950
Female	3	3	22	65	93	117
Number of wage-earners	620	360	11,313	6,319	18,621	22,830
Total employees	655	386	11,640	6,798	19,479	23,897
Salaries ... $	44,307	46,069	565,386	1,019,498	1,675,260	2,137,523
Wages ... $	457,488	230,558	6,078,142	6,111,143	12,877,301	16,471,114
Total ... $	501,795	276,627	6,643,498	7,130,641	14,552,561	18,608,687
Cost of fuel and electricity ... $	125,708	80,222	3,084,741	4,396,722	7,687,393	9,495,825
Net value of products shipped ... $	1,334,934	585,696	18,424,828	25,601,461	45,346,919	58,534,834
ALL INDUSTRIES						
Number of firms	70	36	412	1,012	1,530	2,386
Capital employed ... $	67,356,948	4,945,074	146,332,805	302,937,672	521,572,499	867,021,033
Number of salaried employees—						
Male	581	74	851	1,604	3,110	5,392
Female	61	14	78	247	400	650
Number of wage earners	14,096	1,273	18,749	23,023	57,191	89,060
Total employees	14,738	1,361	19,678	24,924	60,701	95,102
Salaries ... $	1,210,079	191,294	1,770,215	4,178,968	7,350,586	13,017,689
Wages ... $	19,825,151	1,045,432	15,116,030	30,718,656	66,705,269	111,472,822
Total ... $	21,035,230	1,236,726	16,886,275	34,897,624	74,055,855	124,490,511
Cost of fuel and electricity ... $	2,436,137	168,839	6,703,881	9,766,197	19,075,015	26,751,585
Net value of products shipped ... $	28,529,875	2,407,456	57,313,685	116,174,814	204,425,860	315,181,388

Table 28.—Principal Statistics of the Mineral Industry in Canada by Main Classes and by Provinces, 1929—Concluded

(b) Western Canada

Industry	Manitoba	Saskatchewan	Alberta	British Columbia	Yukon	Total for Western Canada
METAL MINING—						
Number of firms	6	...	...	231	23	260
Capital employed $	8,449,979	...	...	135,452,906	7,610,153	151,513,038
Number of salaried employees—						
Male	47	...	...	871	19	937
Female	...	...	...	79	2	81
Number of wage-earners	445	...	...	9,232	431	10,108
Total employees	492	...	...	10,182	452	11,126
Salaries $	136,600	...	...	2,120,990	74,408	2,331,998
Wages $	944,866	...	...	15,451,664	855,005	17,251,535
Total $	1,081,466	...	...	17,572,654	929,413	19,583,533
Cost of fuel and electricity $	154,848	...	...	3,751,218	90,049	3,996,115
Net value of products shipped $	465,570	...	...	51,779,753	2,978,523	55,223,846
NON-METAL MINING INCLUDING FUELS—						
Fuels						
Number of firms	6	58	371	23	1	459
Capital employed $	...	4,398,322	134,312,230	24,031,735	203,000	162,945,287
Number of salaried employees—						
Male	...	33	827	257	...	1,117
Female	...	2	116	20	...	138
Number of wage-earners	...	602	11,760	4,791	3	17,156
Total employees	...	637	12,703	5,068	3	18,411
Salaries $	...	72,374	2,069,923	634,202	...	2,776,499
Wages $	...	602,661	16,794,388	6,094,389	1,200	23,492,638
Total $	...	675,035	18,864,311	6,728,591	1,200	26,269,137
Cost of fuel and electricity $	...	68,088	1,046,210	634,450	15	1,748,763
Net value of products shipped $	...	951,428	30,213,962	9,629,436	1,833	40,796,659
Other Non-Metal Mining—						
Number of firms	2	4	2	18	...	26
Capital employed $	...	513,714	...	1,185,197	...	2,693,517
Number of salaried employees—						
Male	...	10	...	15	...	43
Female	...	1	...	2	...	7
Number of wage-earners	...	36	...	226	...	396
Total employees	...	47	...	243	...	446
Salaries $	...	23,138	...	23,423	...	96,293
Wages $	...	46,801	...	219,794	...	429,567
Total $	...	69,939	...	243,217	...	525,860
Cost of fuel and electricity $	...	33,196	...	25,035	...	123,230
Net value of products shipped $	...	70,112	...	806,379	...	1,547,108
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—						
Number of firms	29	10	23	49	...	111
Capital employed $	8,680,306	1,185,440	8,525,561	9,905,385	...	28,296,692
Number of salaried employees—						
Male	55	22	42	66	...	185
Female	4	1	5	14	...	24
Number of wage-earners	1,124	714	1,062	1,309	...	4,209
Total employees	1,183	737	1,109	1,389	...	4,418
Salaries $	130,026	48,180	101,722	182,385	...	462,313
Wages $	960,929	346,219	940,369	1,346,296	...	3,593,813
Total $	1,090,955	394,399	1,042,091	1,528,681	...	4,056,126
Cost of fuel and electricity $	772,839	72,393	429,958	533,242	...	1,808,432
Net value of products shipped $	4,291,397	1,190,168	3,665,321	4,041,029	...	13,187,915
ALL INDUSTRIES						
Number of firms	**43**	**72**	**396**	**321**	**24**	**856**
Capital employed $	**18,030,285**	**6,097,476**	**142,942,397**	**170,575,223**	**7,813,153**	**345,448,534**
Number of salaried employees—						
Male	**117**	**65**	**872**	**1,209**	**19**	**2,282**
Female	**7**	**4**	**122**	**115**	**2**	**250**
Number of wage-earners	**1,695**	**1,352**	**12,830**	**15,558**	**434**	**31,869**
Total employees	**1,819**	**1,421**	**13,824**	**16,882**	**455**	**34,401**
Salaries $	**312,378**	**143,692**	**2,175,625**	**2,961,000**	**74,408**	**5,667,103**
Wages $	**2,063,612**	**995,681**	**17,739,912**	**23,112,143**	**856,205**	**44,767,553**
Total $	**2,375,990**	**1,139,373**	**19,915,537**	**26,073,143**	**930,613**	**50,434,656**
Cost of fuel and electricity $	**992,386**	**173,677**	**1,476,468**	**4,913,945**	**90,064**	**7,676,540**
Net value of products shipped $	**5,423,628**	**2,211,708**	**33,883,239**	**66,256,597**	**2,980,356**	**110,755,528**

Table 29.—Employees, Salaries and Wages in the Mineral Industry in Canada, by Provinces, 1928 and 1929

Province	*Average number of employees				Salaries and wages		
	Salaried employees		Wage-earners	Total	Salaries	Wages	Total
	Male	Female					
1928					$	$	$
Nova Scotia	548	50	14,899	15,497	1,209,239	20,039,814	21,249,053
New Brunswick	64	12	1,168	1,244	183,344	924,118	1,107,462
Quebec	841	97	16,996	17,934	1,780,263	14,141,481	15,921,744
Ontario	1,589	270	21,649	23,508	4,165,808	27,746,315	31,912,123
Manitoba	104	17	1,504	1,625	255,696	1,670,568	1,926,264
Saskatchewan	49	4	1,176	1,229	112,708	829,442	942,150
Alberta	811	75	11,472	12,358	2,036,932	15,985,105	18,022,037
British Columbia	1,054	80	14,586	15,720	2,567,564	21,497,398	24,064,962
Yukon	21	3	309	333	70,041	738,186	808,227
Canada	5,081	608	83,759	89,448	12,381,595	103,572,427	115,954,022
1929							
Nova Scotia	581	61	14,096	14,738	1,210,070	19,825,151	21,035,230
New Brunswick	74	14	1,273	1,361	191,294	1,045,432	1,236,726
Quebec	851	78	18,749	19,678	1,770,245	15,116,030	16,886,275
Ontario	1,604	247	23,073	24,924	4,178,968	30,718,656	34,897,624
Manitoba	117	7	1,695	1,819	312,378	2,063,612	2,375,990
Saskatchewan	65	4	1,352	1,421	143,692	995,681	1,139,373
Alberta	872	122	12,830	13,824	2,175,625	17,739,912	19,915,537
British Columbia	1,209	115	15,558	16,882	2,961,000	23,112,143	26,073,143
Yukon	19	2	434	455	74,408	856,205	930,613
Canada	5,392	650	89,060	95,102	13,017,689	111,472,822	124,190,511

***Note on the Method of Computing the Average Number of Wage-earners for Each Industry.**—If a company works only 3 months in the year, the average number of wage-earners for this company is obtained by adding the monthly figures and dividing by 3. If a second company operates every month in the year, the average number of wage-earners for this company is obtained by adding the monthly figures and dividing by 12. The average number of wage-earners for each other company in the industry is computed in the same way. The average number of wage-earners in the industry during the year is the sum of these individual averages.

Table 30.—Employees, Salaries and Wages in the Mineral Industry in Canada, by Industries, 1928 and 1929

Industry and Year	*Average number of employees				Salaries and wages		
	Salaried employees		Wage-earners	Total	Salaries	Wages	Total
	Male	Female					
1928					$	$	$
METAL MINING							
Alluvial Gold	22	3	317	342	50,836	487,434	538,270
Auriferous Quartz	565	43	8,458	9,066	1,637,362	12,978,628	14,615,990
Copper-gold-silver	424	37	4,316	4,777	844,646	5,919,663	6,761,309
Silver-Cobalt	90	4	1,072	1,166	246,284	1,563,182	1,809,466
Silver-Lead-Zinc	284	18	3,378	3,680	646,460	4,885,174	5,531,634
Nickel copper	43	1	1,919	1,963	142,249	2,994,589	3,136,838
Miscellaneous	4	1	57	62	7,850	54,036	61,886
Non-Ferrous Smelting and Refining	612	73	6,841	7,526	1,635,580	10,593,158	12,228,738
NON-METAL MINING INCLUDING FUELS							
Fuels							
Coal	1,404	98	28,754	30,256	3,388,458	39,932,353	43,320,811
Natural Gas	409	137	1,114	1,660	818,919	1,286,729	2,105,648
Petroleum	79	16	1,023	1,118	156,600	1,760,025	1,916,625

* See note above.

Table 30.—Employees, Salaries and Wages in the Mineral Industry in Canada, by Industries, 1928 and 1929—Concluded

Industry and Year	*Average number of employees				Salaries and wages		
	Salaried employees		Wage-earners	Total	Salaries	Wages	Total
	Male	Female					
1928					$	$	$
Other Non-Metal Mining							
Abrasives	10	1	152	**163**	20,710	75,848	96,558
Asbestos	128	19	3,023	**3,170**	372,070	3,617,574	**3,989,644**
Feldspar	7	1	215	**223**	14,172	130,488	**144,660**
Gypsum	57	18	1,084	**1,159**	180,870	990,944	**1,171,814**
Iron oxides	3	.....	42	**45**	4,074	34,760	**38,834**
Mica	4	2	88	**94**	6,480	35,679	**42,159**
Quartz	15	2	241	**258**	24,884	197,788	**222,672**
Salt	45	16	394	**455**	117,376	422,399	**539,775**
Talc and Soapstone	7	2	82	**91**	17,410	67,751	**85,161**
Miscellaneous	36	5	353	**394**	73,118	341,532	**414,650**
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS							
Cement	113	9	2,285	**2,407**	256,867	3,148,518	**3,405,385**
Clay products	321	48	4,826	**5,195**	806,209	4,375,189	**5,181,398**
Lime	84	16	1,118	**1,218**	184,732	1,131,383	**1,316,115**
Sand and Gravel	83	12	7,736	**7,831**	199,745	2,268,723	**2,468,468**
Stone	232	26	4,871	**5,129**	527,634	4,278,880	**4,806,514**
Total	**5,081**	**668**	**83,759**	**89,448**	**12,381,595**	**103,572,427**	**115,954,022**
1929							
METAL MINING							
Alluvial Gold	22	7	459	**488**	66,881	519,312	**586,193**
Auriferous Quartz	491	33	8,136	**8,660**	1,543,625	12,715,108	**14,258,733**
Copper-Gold-Silver	401	29	4,813	**5,243**	900,605	7,598,150	**8,498,755**
Silver-Cobalt	90	6	1,053	**1,149**	235,450	1,296,883	**1,532,333**
Silver-Lead-Zinc	342	29	3,782	**4,153**	770,457	5,711,935	**6,482,392**
Nickel-Copper	46	1	3,172	**3,219**	151,655	4,954,220	**5,105,875**
Miscellaneous	5	.....	89	**94**	11,090	31,747	**42,837**
Non-Ferrous Smelting and Refining	621	63	7,435	**8,119**	1,753,840	12,018,553	**13,772,393**
NON-METAL MINING INCLUDING FUELS							
Fuels							
Coal	1,402	110	28,227	**29,739**	3,293,949	39,082,429	**42,376,378**
Natural Gas	475	137	1,341	**1,953**	881,525	1,393,622	**2,275,147**
Petroleum	178	55	1,988	**2,221**	383,490	3,365,199	**3,748,689**
Other Non-Metal Mining							
Abrasives	16	2	136	**154**	38,648	114,157	**152,805**
Asbestos	172	25	3,194	**3,391**	419,799	3,990,736	**4,410,535**
Feldspar	5	4	200	**209**	19,936	144,504	**164,440**
Gypsum	58	13	916	**987**	175,256	878,957	**1,054,213**
Iron Oxides	2	.....	46	**48**	3,560	43,764	**47,324**
Mica	5	.....	78	**83**	11,116	36,246	**47,362**
Quartz	17	1	261	**279**	22,311	167,140	**189,451**
Salt	41	12	371	**424**	102,502	413,951	**516,453**
Talc and Soapstone	7	2	77	**86**	13,705	60,595	**74,300**
Miscellaneous	46	4	456	**506**	80,716	464,500	**545,216**
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS							
Cement	114	10	2,422	**2,546**	260,579	3,263,016	**3,523,595**
Clay Products	365	50	5,115	**5,530**	941,445	4,785,569	**5,727,014**
Lime	91	18	1,273	**1,382**	158,604	1,234,488	**1,393,092**
Sand and Gravel	89	14	8,655	**8,758**	189,834	2,315,391	**2,505,225**
Stone	291	25	5,365	**5,681**	587,111	4,872,650	**5,459,761**
Total	**5,392**	**650**	**89,060**	**95,102**	**13,017,689**	**111,472,822**	**124,490,511**

* See note page 37.

Table 31.—Wage-Earners in the Mineral Industry in Canada, by Months and by Classes, 1928 and 1929

Month	Metal Mining	Non-Metal Mining including Fuels			Clay Products and other Structural Materials			Total
		Fuels	Other Non-Metallics	Total	Clay Products	Other structural materials	Total	
1928								
January	22,378	32,880	4,435	37,315	2,421	4,967	7,388	**67,081**
February	22,857	31,328	4,323	35,651	2,370	5,171	7,541	**66,049**
March	23,550	30,213	4,419	34,632	2,912	5,959	8,871	**67,053**
April	23,748	28,675	4,740	33,415	3,503	7,319	10,822	**67,985**
May	24,906	28,463	5,360	33,823	4,665	10,002	14,667	**73,396**
June	25,524	29,049	5,637	34,686	4,980	15,383	20,363	**80,573**
July	25,663	29,486	5,691	35,177	5,129	15,480	20,609	**81,449**
August	25,862	30,166	5,813	35,979	5,136	11,245	16,381	**78,222**
September	26,177	30,782	5,910	36,692	4,700	10,502	15,202	**78,071**
October	26,474	32,584	5,927	38,511	4,362	10,073	14,435	**79,420**
November	25,737	32,741	5,724	38,465	4,008	9,251	13,259	**77,461**
December	24,745	32,666	5,372	38,038	3,348	7,249	10,597	**73,380**
***Average**	**26,358**	**30,891**	**5,674**	**36,565**	**4,826**	**16,010**	**20,836**	**83,759**
1929								
January	25,052	31,961	4,155	36,116	2,838	6,081	8,919	**70,087**
February	25,330	31,564	4,423	35,987	2,445	5,998	8,443	**69,760**
March	25,377	29,531	4,687	34,218	2,950	6,799	9,749	**69,344**
April	25,917	28,300	4,952	33,252	4,043	8,630	12,673	**71,842**
May	27,262	27,992	5,803	33,795	5,123	10,979	16,102	**77,159**
June	28,096	29,011	5,898	34,909	5,586	17,002	22,588	**85,593**
July	28,755	29,440	6,085	35,525	5,675	17,384	23,059	**87,339**
August	28,989	30,424	6,090	36,514	5,654	12,111	17,765	**83,268**
September	28,921	32,416	6,137	38,553	5,210	11,195	16,405	**83,879**
October	29,417	33,799	5,968	39,767	4,707	10,521	15,228	**84,412**
November	28,993	33,894	5,527	39,421	4,307	9,066	13,373	**81,787**
December	27,268	33,727	5,037	38,764	3,598	6,853	10,451	**76,483**
***Average**	**28,939**	**31,556**	**5,735**	**66,230**	**5,115**	**17,715**	**22,830**	**89,060**

* See note page 37.

Table 32.—Wage-Earners in the Mineral Industry in Canada, by Months and by Provinces, 1928 and 1929

Month	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Yukon	Canada
1928										
January	14,216	817	8,592	16,485	718	776	12,566	12,726	185	**67,081**
February	14,089	803	8,578	16,786	741	648	11,359	12,860	185	**66,049**
March	14,195	853	9,491	17,507	835	614	10,343	13,036	179	**67,053**
April	14,635	885	9,952	18,724	925	496	9,100	12,965	303	**67,985**
May	15,116	1,110	11,614	20,628	1,333	695	8,775	13,759	366	**73,396**
June	15,171	1,141	16,734	21,429	1,453	730	9,356	14,220	339	**80,573**
July	15,051	1,162	16,821	21,667	1,502	625	9,936	14,351	334	**81,449**
August	14,872	1,078	13,115	21,581	1,460	630	10,844	14,287	355	**78,222**
September	14,347	1,071	12,832	21,451	1,305	784	11,448	14,439	394	**78,671**
October	14,332	1,341	12,587	21,429	1,161	1,033	12,412	14,759	366	**79,420**
November	14,524	1,056	12,224	20,131	1,100	1,074	12,932	14,113	307	**77,461**
December	14,404	997	10,783	18,683	927	810	13,000	13,520	256	**73,380**
***Average**	**14,899**	**1,168**	**16,996**	**21,649**	**1,504**	**1,176**	**11,472**	**14,586**	**309**	**83,759**
1929										
January	13,572	1,032	9,468	18,074	828	784	12,648	13,426	255	**70,087**
February	13,392	1,080	9,410	18,158	834	748	12,556	13,319	263	**69,760**
March	13,047	1,075	9,700	18,932	958	723	10,747	13,890	272	**69,344**
April	13,557	1,081	10,526	20,628	1,206	760	9,624	14,159	298	**71,842**
May	13,981	1,231	12,504	22,420	1,492	895	9,922	14,298	416	**77,159**
June	14,213	1,303	18,230	23,084	1,897	937	10,821	14,655	443	**85,593**
July	14,080	1,347	18,626	23,683	1,951	809	11,248	15,054	460	**87,339**
August	13,973	1,340	13,669	23,820	2,028	827	12,093	15,053	465	**83,268**
September	14,285	1,292	13,357	23,199	1,802	1,030	13,074	15,374	466	**83,879**
October	14,261	1,245	13,118	23,010	1,575	1,033	14,094	15,655	421	**84,412**
November	14,076	1,175	12,541	22,034	1,382	957	14,078	15,207	337	**81,787**
December	13,869	1,015	11,133	20,326	1,062	856	13,946	14,003	273	**76,483**
***Average**	**14,096**	**1,273**	**18,749**	**23,073**	**1,695**	**1,352**	**12,830**	**15,558**	**434**	**89,060**

* See note page 37.

Table 33.—Wage-Earners Working in Month of Greatest Employment Classified According to the Number of Hours Worked per Day for the Mineral Industry in Canada, by Provinces and by Industries, 1928 and 1929

Province and Industry	Number of wage-earners working			
	8 hours or less per day	9 hours	10 hours	Over 10 hours
1928				
By Provinces—				
Nova Scotia	4,541	1,093	776	68
New Brunswick	247	781	196	10
Quebec	2,638	2,465	12,824	779
Ontario	12,915	5,677	4,257	843
Manitoba	375	186	978	76
Saskatchewan	85	17	900	27
Alberta	12,770	657	640	178
British Columbia	15,907	71	18	14
Yukon	218	3	191	15
Canada	**49,696**	**10,950**	**20,780**	**2,010**
By Industries—				
METAL MINING—				
Alluvial Gold	249	7	203	29
Auriferous Quartz	7,690	1,480	73	85
Copper-Gold-Silver	3,697	935	232	37
Silver-Cobalt	910	250	6	7
Silver-Lead-Zinc	3,696	171	234	29
Nickel-Copper	1,827	489	27	9
Miscellaneous	25	38	.....	8
Non-Ferrous Smelting and Refining	5,877	818	953	78
NON-METAL MINING INCLUDING FUELS—				
Fuels—				
Coal	21,804	687	1,002	38
Natural Gas	345	937	33	8
Petroleum	680	249	74	57
Other Non-Metal Mining—				
Abrasives	10	28	152	6
Asbestos	18	60	3,205	71
Feldspar	.....	129	132	.....
Gypsum	88	906	439	69
Iron Oxides	.....	.....	32	25
Mica	24	17	37	.....
Quartz	43	32	214	.....
Salt	68	222	98	13
Talc and Soapstone	12	6	64	.....
Miscellaneous	.....	.....	.....	.....
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—				
Cement	809	458	878	587
Clay Products	846	1,363	3,046	390
Lime	247	347	680	108
Sand and Gravel	172	94	4,903	221
Stone	559	1,227	4,063	135
Total	**49,696**	**10,950**	**20,780**	**2,010**
1929				
By Provinces—				
Nova Scotia	15,707	852	774	20
New Brunswick	297	909	220	22
Quebec	3,271	2,824	8,907	869
Ontario	14,009	6,314	4,983	895
Manitoba	342	295	1,127	289
Saskatchewan	74	95	858	62
Alberta	14,686	823	618	123
British Columbia	17,934	157	90	25
Yukon	504	1	2	.....
Canada	**66,824**	**12,270**	**17,579**	**2,305**
By Industries—				
METAL MINING—				
Alluvial Gold	415	74	74	10
Auriferous Quartz	7,335	1,448	138	70
Copper-Gold-Silver	4,463	1,067	150	81
Silver-Cobalt	837	242	4	9
Silver-Lead-Zinc	4,166	142	262	34
Nickel-Copper	3,219	685	260	2
Miscellaneous	47	26	23	.....
Non-Ferrous Smelting and Refining	6,514	1,071	807	44

Table 33.—Wage-Earners Working in Month of Greatest Employment Classified According to the Number of Hours Worked per Day for the Mineral Industry in Canada, by Provinces and by Industries, 1928 and 1929—Concluded

Province and Industry	Number of wage-earners working			
	8 hours or less per day	9 hours	10 hours	Over 10 10 hours
NON-METAL MINING INCLUDING FUELS—				
Fuels—				
Coal	33,860	930	852	20
Natural Gas	468	879	37	6
Petroleum	1,963	172	97	71
Other Non-Metal Mining—				
Abrasives	22	30	175	2
Asbestos	.....	55	3,238	68
Feldspar	.....	146	132	.....
Gypsum	91	536	478	130
Iron Oxides	.....	.....	39	16
Mica	9	35	63	.....
Quartz	58	36	240	6
Salt	43	179	158	20
Talc and Soapstone	.....	6	72	.....
Miscellaneous	160	46	304	39
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—				
Cement	943	551	845	482
Clay Products	829	1,986	3,010	435
Lime	310	295	780	226
Sand and Gravel	256	266	796	99
Stone	816	1,367	4,545	435
Total	**66,824**	**12,270**	**17,579**	**2,365**

Table 34.—Fuel and Electricity Used in the Mineral

Industry		Bituminous coal		Anthracite coal	Lignite coal		Coke
		Canadian	Imported		Canadian	Imported	
		Tons	Tons	Tons	Tons	Tons	Tons
Metal Mining							
Alluvial Gold	Quantity	...	...	...	...	...	...
	$	...	...	...	...	...	...
Auriferous Quarts	Quantity	1,233	25,338	323	...	...	192
	$	14,601	259,426	6,085	...	...	2,913
Copper-Gold-Silver	Quantity	6,498	40	...	15	...	32
	$	51,679	426	...	840	...	659
Silver-Cobalt	Quantity	...	7,594	780	...	...	...
	$	...	89,546	12,300	...	...	...
Silver-Lead-Zinc	Quantity	27,139	3,563	12	389	...	624
	$	136,881	32,126	312	3,878	...	5,183
Nickel-Copper	Quantity	...	2,546	38	...	...	145
	$	...	15,891	678	...	...	1,520
Miscellaneous	Quantity	150	...	...	...	...	...
	$	1,200	...	...	...	...	...
Non-Ferrous Smelting and Refining	Quantity	70,362	152,230	238	...	...	*3,929
	$	445,475	982,235	3,064	...	...	42,125
Total	**Quantity**	**105,382**	**191,311**	**1,391**	**404**	...	**4,922**
	$	**649,836**	**1,379,650**	**22,439**	**4,718**	...	**52,400**
Non-Metal Mining, Including Fuels							
Fuels							
Coal	Quantity	859,922	...	...	153,746	...	...
	$	3,073,544	...	...	135,975	...	...
Natural Gas	Quantity	161	72	...	...	...	1
	$	1,197	697	...	...	...	12
Petroleum	Quantity	2,599	...	...	522	...	...
	$	22,663	...	...	3,174	...	...
Total	*Quantity*	*862,682*	*72*	...	*154,268*	...	*1*
	$	*3,097,404*	*697*	...	*139,149*	...	*12*
Other Non-Metal Mining							
Asbestos	Quantity	38,893	12,186	14,123	...	...	2,357
	$	266,607	94,642	95,224	...	...	28,617
Feldspar	Quantity	...	764	...	...	...	...
	$	...	6,693	...	...	...	...
Gypsum	Quantity	11,528	5,980	5	...	...	590
	$	70,736	44,965	53	...	...	4,957
Iron Oxides	Quantity	1,001	...	22	...	...	...
	$	7,197	...	341	...	...	...
Mica	Quantity	...	60	...	...	...	...
	$	...	420	...	...	...	...
Quartz	Quantity	78	3,590	...	...	...	...
	$	557	22,970	...	...	...	...
Salt	Quantity	2,576	47,481	...	...	...	...
	$	11,310	213,416	...	...	...	...
Talc	Quantity	...	394	...	...	...	...
	$	...	2,563	...	...	...	...
Miscellaneous	Quantity	6,123	6,209	2	...	...	...
	$	37,691	34,519	31	...	...	...
Natural Abrasives	Quantity	1,057	...	...	...	...	...
	$	7,534	...	...	...	...	...
Total	*Quantity*	*61,256*	*76,664*	*14,152*	...	...	*2,947*
	$	*401,632*	*420,188*	*95,649*	...	...	*33,574*
Structural Materials and Clay Products							
Cement	Quantity	276,721	282,914	...	20,358	...	84
	$	1,473,885	1,551,324	...	61,126	...	781
Clay Products	Quantity	30,870	205,688	4,676	27,058	...	4,745
	$	211,385	1,284,679	33,557	56,785	...	33,553
Lime	Quantity	18,409	57,762	1,642	90	...	10,940
	$	125,620	285,337	7,383	450	...	73,143
Sand and Gravel	Quantity	3,873	22,627	...	193	...	...
	$	28,614	128,006	...	647	...	...
Stone	Quantity	6,908	24,027	575	90	...	...
	$	45,231	163,193	3,257	736	...	...
Total	**Quantity**	**336,781**	**593,018**	**6,893**	**47,789**	...	**15,769**
	$	**1,884,735**	**3,412,539**	**44,197**	**119,744**	...	**107,477**
Canada	**Quantity**	**1,366,101**	**861,065**	**22,436**	**202,461**	...	**23,639**
	$	**6,033,607**	**5,213,074**	**162,285**	**263,611**	...	**193,463**

*Coke used for fuel only. Coke used in smelting amounted to 187,960 tons valued at $1,824,061.

Industry in Canada, by Kinds and by Industries, 1928

Gasolene	Kerosene	Fuel oil and diesel oil	Wood	Gas		Other fuel	Electricity purchased for power only	Total	Electricity generated	
				Manufactured	Natural				For own use	For sale
Imp.Gal.	Imp. gal.	Imp. gal.	Cords	M cu. ft.	M cu. ft.		K.W.H.		K.W.H.	K.W.H.
500	95	800	1,280	...	...	...	4,764,440	...	3,080,890	6,744,140
545	76	640	8,273	...	...	...	47,644	57,178	...	67,741
72,891	15,766	1,458,077	26,504	...	...	...	224,756,744	...	9,090,375	145,705
24,045	4,656	122,963	116,472	...	...	1,434	2,002,062	2,554,657	...	2,914
65,479	26,507	676,058	17,744	...	...	...	66,446,922	...	30,117,509	...
25,277	5,522	72,130	84,762	...	...	...	490,541	731,836	...	...
3,121	90	93,485	1,099	...	...	...	15,596,388	...	...	...
944	22	12,994	6,252	...	...	26,220	282,405	430,683	...	...
68,714	4,553	431,156	9,002	...	...	...	47,255,254	...	867,522	...
31,773	1,020	92,265	55,776	...	...	1,418	310,932	671,564	...	...
15,049	1,438	65,171	30	...	...	...	38,148,448	...	...	...
4,194	321	7,218	105	...	...	...	91,078	121,005	...	...
200	200	...	1,500	...	...	...	...	...	...	...
100	80	...	7,500	...	...	...	...	8,880	...	...
53,472	9,160	7,920,699	7,867	30,011	185	...	1,133,644,412	...	257,742,837	...
15,109	2,520	579,190	59,046	3,717	154	1,363	3,046,772	5,180,770	...	...
279,426	**57,809**	**10,645,446**	**65,026**	**30,011**	**185**	...	**1,530,612,608**	...	**300,829,133**	**6,889,845**
101,987	**14,217**	**887,400**	**338,186**	**3,717**	**154**	**30,435**	**6,271,434**	**9,756,573**	...	**70,655**
10,287	2,441	...	...	...	...	...	29,598,802	...	108,926,689	4,157,361
3,323	702	...	...	...	...	...	466,177	3,679,721	...	76,527
...	...	...	...	...	...	...	...	...	...	...
...	...	...	36	...	72,756	...	746	...	8,550	...
...	...	...	322	...	32,120	...	48	34,296	...	...
29,703	3,600	184,124	172	...	1,723,255	...	2,197,500	...	88,000	...
8,750	1,440	15,464	1,054	...	124,256	...	28,382	205,183	...	...
39,990	*6,041*	*184,124*	*208*	...	*1,796,011*	...	*31,797,048*	...	*109,023,239*	*4,157,361*
12,073	*2,142*	*15,464*	*1,376*	...	*156,376*	...	*494,607*	*3,919,300*	...	*76,527*
14,898	5,222	2,350	...	...	...	...	62,593,252	...	...	...
3,278	1,149	306	...	...	...	...	687,892	1,177,715	...	...
12,462	...	...	733	...	...	...	...	...	...	...
3,237	...	...	2,968	...	...	...	...	12,898	...	...
158,027	...	176,065	1,680	...	3,550	...	5,060,964	...	64,000	...
35,401	...	16,100	3,351	...	1,516	...	65,181	242,260	...	...
1,600	...	145	1,592	...	...	...	144,728	...	...	...
472	...	17	7,744	...	...	...	2,895	18,666	...	...
1,100	...	...	200	...	...	...	...	...	...	...
308	...	...	1,238	...	...	...	...	1,966	...	...
2,352	1,016	55,615	...	...	...	...	630,000	...	...	...
571	242	3,391	...	...	...	...	8,217	35,918	...	...
...	...	27,272	2	...	...	...	1,845,790	...	...	...
...	...	3,548	8	...	...	6,472	17,714	252,468	...	...
...	...	...	60	...	...	...	1,404,700	...	...	...
...	...	...	68	...	...	...	19,219	21,850	...	...
1,079	125	277,965	2,409	7,859	...	...	2,535,760	...	...	...
233	31	22,874	9,271	628	...	...	22,751	128,029	...	...
2,223	...	...	833	...	...	...	74,000	...	...	...
500	...	...	3,009	...	...	...	1,955	12,998	...	...
193,741	*6,363*	*569,412*	*7,509*	*7,859*	*3,550*	...	*74,289,194*	...	*64,000*	...
4,[illegible]	*1,422*	*46,236*	*27,657*	*628*	*1,516*	*6,472*	*825,824*	*1,904,798*	...	...
7,486	803	...	...	...	...	...	179,771,381	...	12,087,200	...
1,695	168	...	...	...	...	...	783,129	3,872,108	...	...
34,174	2,345	339,815	55,337	629	727,218	...	15,640,454	...	1,000	...
7,981	512	33,300	306,344	50	36,907	...	289,297	2,294,350	...	...
1,465	245	385,525	71,561	217,108	13,000	...	4,864,482	...	343,658	...
338	61	15,746	324,943	17,369	6,500	...	55,505	912,395	...	...
24,983	2,005	28,710	125	...	...	...	1,522,877	...	...	...
5,788	492	2,153	900	...	...	...	26,791	193,391	...	...
85,210	4,500	67,706	3,313	...	...	...	17,893,126	...	1,400,000	...
20,065	1,128	5,497	14,493	...	...	...	325,486	579,086	...	...
153,318	**9,898**	**821,756**	**130,336**	**217,737**	**746,218**	...	**219,692,320**	...	**13,831,858**	...
35,867	**2,361**	**56,696**	**646,680**	**17,419**	**43,407**	...	**1,480,208**	**7,851,330**	...	...
666,475	**80,111**	**12,190,738**	**202,079**	**255,607**	**2,539,964**	...	**1,856,391,170**	...	**423,818,230**	**11,047,206**
193,927	**20,142**	**1,005,796**	**1,913,899**	**21,764**	**201,453**	**36,907**	**9,072,073**	**23,432,001**	...	**147,182**

Table 35.—Fuel and Electricity Used in the Mineral

Industry		Bituminous coal		Anthracite coal	Lignite coal		Coke
		Canadian	Imported		Canadian	Imported	
		Tons	Tons	Tons	Tons	Tons	Tons
METAL MINING							
Alluvial Gold	Quantity	1		4			
	$	5		80			
Auriferous Quartz	Quantity	591	23,603	1,451			135
	$	7,718	240,803	8,408			3,150
Copper-Gold-Silver	Quantity	4,088	1,297		3	2	44
	$	45,050	10,927		121	26	854
Silver-Cobalt	Quantity		6,424	783			
	$		72,857	12,308			
Silver-Lead-Zinc	Quantity	40,204	2,815	19	157	111	220
	$	198,195	25,047	554	1,338	1,177	2,193
Nickel-Copper	Quantity		6,614	64			72
	$		41,414	1,085			636
Miscellaneous	Quantity		2				
	$		12				
Non-Ferrous Smelting and Refining	Quantity	81,613	165,059				*14,014
	$	616,384	1,016,939				146,330
Total	**Quantity**	**126,497**	**285,824**	**2,321**	**160**	**113**	**14,545**
	$	**867,352**	**1,407,999**	**22,435**	**1,459**	**1,203**	**153,469**
NON-METAL MINING, INCLUDING FUELS							
Fuels							
Coal	Quantity	828,352			152,248		
	$	2,932,230			142,141		
Natural Gas	Quantity	1,783					2
	$	8,545					28
Petroleum	Quantity	5,163			2,757		
	$	38,691			19,071		
Total	*Quantity*	*835,298*			*155,005*		*2*
	$	*2,979,466*			*161,212*		*28*
Other Non-Metal Mining							
Asbestos	Quantity	39,590	16,427	16,371			1,682
	$	284,225	126,149	107,320			21,016
Feldspar	Quantity		799			1	
	$		6,524			16	
Gypsum	Quantity	11,646	8,132				1,298
	$	68,375	61,434				12,965
Iron Oxides	Quantity	1,034		22			
	$	8,916		330			
Mica	Quantity		40				
	$		280				
Quartz	Quantity	45	3,176				
	$	382	18,010				
Salt	Quantity	2,095	49,713				
	$	9,641	216,911				
Talc	Quantity		370				
	$		2,456				
Miscellaneous	Quantity	2,431	2,188	2			
	$	13,715	9,402	31			
Natural Abrasives	Quantity	1,753			190		26
	$	13,996			847		312
Total	*Quantity*	*58,594*	*80,845*	*16,395*	*190*	*1*	*3,006*
	$	*399,260*	*441,166*	*107,681*	*847*	*16*	*34,293*

* Coke used for fuel only. Coke used in smelting amounted to 368,322 tons, valued at $3,280,757.

Industry in Canada, by Kinds and by Industries, 1929

Gasolene	Kerosene	Fuel oil and diesel oil	Wood	Gas		Other fuel	Electricity purchased for power only	Total	Electricity generated	
				Manufactured	Natural				For own use	For sale
Imp. gal.	Imp. gal.	Imp. gal.	Cords	M cu. ft.	M cu. ft.		K.W.H.		K.W.H.	K.W.H.
1,589	239	237	180	...	...	...	...	...	9,040,492	2,365,008
969	127	858	930	...	...	...	...	2,969	...	23,650
82,754	9,868	1,616,247	30,784	...	...	...	233,219,275	...	12,826,279	2,805,900
31,782	2,973	136,786	162,973	...	...	623	1,983,959	2,579,481	...	28,059
79,702	7,856	829,518	20,246	...	...	...	96,457,100	...	25,983,571	...
40,338	2,530	101,147	94,712	...	...	277	739,141	1,035,133	...	...
3,398	75	86,810	3,079	...	...	...	15,576,292	...	...	...
1,956	18	11,649	14,602	...	...	19,673	275,789	407,952	...	...
81,785	1,534	624,389	9,778	...	...	...	53,499,043	...	14,610,124	3,859,990
36,183	543	119,378	53,557	...	...	42	354,932	793,139	...	25,790
8,147	2,254	87,168	42	...	...	...	62,833,171	...	...	...
1,957	557	9,199	305	...	...	...	129,210	184,363	...	...
300	...	12,000	1,500	...	...	...	...	...	...	...
80	...	3,000	7,125	...	...	...	...	10,217	...	...
85,155	...	12,520,517	612	282,531	...	...	1,100,557,202	...	101,547,487	26,539,711
23,957	...	913,578	4,411	34,751	...	1,128	3,451,255	6,208,733	...	190,959
342,830	**21,826**	**15,776,886**	**66,221**	**282,531**	...	...	**1,562,142,983**	...	**224,007,953**	**35,570,609**
136,332	**6,748**	**1,235,595**	**338,615**	**34,751**	...	**21,743**	**6,934,286**	**11,221,987**	...	**268,458**
10,283	1,232	...	2,008	...	...	...	40,326,458	...	108,949,704	6,554,222
3,072	367	...	9,295	...	...	...	570,250	3,657,355	...	100,321
...	...	...	18	...	83,002	...	3,055	...	...	...
...	...	...	158	...	32,779	...	80	41,590	...	...
44,640	371	342,320	624	...	5,489,032	...	2,207,179	...	...	...
13,417	89	26,027	3,148	...	169,868	...	23,043	293,354	...	...
54,923	*1,603*	*342,320*	*2,650*	...	*5,572,034*	...	*42,536,692*	...	*108,949,704*	*6,554,222*
16,489	*456*	*26,027*	*12,601*	...	*202,647*	...	*593,373*	*3,992,299*	...	*100,321*
32,740	5,776	3,250	...	...	...	...	71,387,897	...	...	...
6,875	1,142	293	...	...	...	...	788,590	1,335,610	...	...
21,209	948	...	602	...	...	...	...	...	...	...
5,105	209	...	2,268	...	...	...	...	14,122	...	...
143,991	1,314	219,559	1,802	...	3,335	...	5,758,484	...	...	...
36,664	329	15,836	3,754	...	1,395	...	80,267	281,619	...	...
...	...	145	227	...	...	...	149,328	...	...	...
...	...	18	1,313	...	...	...	2,987	13,561	...	...
117	...	...	5	...	...	...	...	...	45	...
42	...	...	33	...	...	...	...	355	...	...
2,911	747	12,861	...	...	...	...	478,881	...	...	...
691	156	824	...	...	...	...	7,277	27,340	...	...
...	...	98,427	...	...	...	...	1,323,087	...	...	...
...	...	4,678	...	...	...	5,898	12,536	249,664	...	...
601	...	...	...	...	...	...	1,011,292	...	...	...
159	...	...	...	...	...	...	18,780	21,395	...	...
8,541	125	346,965	646	127,171	...	...	891,300	...	...	...
2,563	36	29,768	1,636	10,174	...	...	12,138	79,463	...	...
5,459	666	...	385	...	...	...	10,096	...	...	...
1,286	200	...	1,990	...	...	...	311	18,942	...	...
215,569	*9,576*	*681,207*	*5,667*	*127,171*	*3,335*	...	*81,010,365*	...	*45*	...
53,385	*2,072*	*61,417*	*10,994*	*10,174*	*1,395*	*5,898*	*922,886*	*2,041,474*	...	...

Table 35.—Fuel and Electricity Used in the Mineral

Industry		Bituminous coal		Anthracite coal	Lignite coal		Coke
		Canadian	Imported		Canadian	Imported	
		Tons	Tons	Tons	Tons	Tons	Tons
STRUCTURAL MATERIALS AND CLAY PRODUCTS							
Cement	Quantity	308,090	298,969	.....	11,826	.....	130
	$	1,597,808	1,750,170	.....	43,726	.....	1,362
Clay Products	Quantity	30,425	266,046	3,550	28,309	.....	4,279
	$	210,132	1,725,021	28,074	61,970	.....	31,193
Lime	Quantity	39,948	90,014	1,225	.....	.....	11,760
	$	254,344	421,968	5,156	.....	.....	79,607
Sand and Gravel	Quantity	3,552	33,636	16	1,097	.....	.....
	$	27,646	188,389	248	3,403	.....	.....
Stone	Quantity	12,131	27,617	677	.....	.....	4
	$	81,422	189,384	4,853	.....	.....	40
Total	**Quantity**	**394,146**	**716,282**	**5,468**	**41,232**	.....	**16,173**
	$	**2,171,352**	**4,274,932**	**38,331**	**109,099**	.....	**112,202**
Canada	**Quantity**	**1,414,535**	**1,602,951**	**21,184**	**196,587**	**114**	**33,726**
	$	**6,417,420**	**6,124,097**	**168,447**	**272,617**	**1,219**	**299,992**

Table 36.—Fuel and Electricity Used in the Mineral

Province		Bituminous coal		Anthracite coal	Lignite coal		Coke
		Canadian	Imported		Canadian	Imported	
		Tons	Tons	Tons	Tons	Tons	Tons
Nova Scotia	Quantity	530,871	.....	5	.....	.....	4,111
	$	2,069,222	.....	53	.....	.....	20,456
New Brunswick	Quantity	17,480	4	1	.....	.....	1
	$	91,458	80	9	.....	.....	12
Quebec	Quantity	282,196	151,521	17,028	90	.....	6,570
	$	1,637,153	1,064,044	117,317	736	.....	72,640
Ontario	Quantity	1,626	674,424	4,572	.....	.....	12,136
	$	12,457	3,874,977	37,780	.....	.....	93,235
Manitoba	Quantity	211	35,015	290	15	.....	2
	$	2,467	272,991	2,882	840	.....	36
Saskatchewan	Quantity	6,069	.....	.....	55,864	.....	.....
	$	52,397	.....	.....	63,924	.....	.....
Alberta	Quantity	168,552	.....	.....	146,103	.....	49
	$	613,854	.....	.....	194,233	.....	172
British Columbia	Quantity	359,091	101	540	389	.....	770
	$	1,554,574	982	4,244	3,878	.....	6,912
Yukon	Quantity	5	.....	.....	.....	.....	.....
	$	25	.....	.....	.....	.....	.....
Canada	**Quantity**	**1,366,101**	**861,065**	**22,436**	**202,461**	.....	**23,639**
	$	**6,033,607**	**5,213,074**	**162,285**	**263,611**	.....	**193,463**

in Canada, by Kinds and by Industries, 1929—Concluded

Gasolene	Kerosene	Fuel oil and diesel oil	Wood	Gas		Other fuel	Electricity purchased for power only	Total	Electricity generated	
				Manufactured	Natural				For own use	For sale
Imp. gal	Imp. gal.	Imp. gal.	Cords	M cu. ft.	M cu. ft.		K.W.H.		K.W.H.	K.W.H.
18,689	2,798	27,471	.....	.....	.....	.....	200,133,083	.....	16,386,100	.....
4,501	612	3,571	.....	.....	.....	.....	945,469	4,347,219	.....	.....
57,352	2,100	222,950	65,711	.....	915,979	.....	30,018,402	.....	.....	.....
13,360	639	24,793	339,282	.....	36,853	.....	449,067	2,920,384	.....	.....
3,706	310	343,245	73,104	268,588	17,549	.....	9,443,592	.....	387,286	.....
967	76	11,330	310,792	21,487	8,537	.....	69,049	1,183,313	.....	.....
80,030	594	2,792	.....	.....	.....	.....	3,722,346	.....	.....	.....
19,638	135	1,023	.....	.....	.....	.....	45,000	285,491	.....	.....
171,074	61,517	186,489	3,841	.....	.....	.....	25,405,092	.....	1,313,359	.....
43,145	9,866	18,231	18,582	.....	.....	.....	393,895	759,418	.....	.....
330,851	**67,328**	**782,947**	**112,656**	**268,588**	**933,528**	.....	**268,722,518**	.....	**18,086,745**	.....
81,611	**11,328**	**58,948**	**668,656**	**21,487**	**45,390**	.....	**1,902,489**	**9,495,825**	.....	.....
941,173	**100,333**	**17,583,360**	**215,194**	**678,290**	**6,508,897**	.....	**1,954,411,658**	.....	**351,044,447**	**42,121,831**
287,817	**20,604**	**1,431,987**	**1,030,866**	**66,412**	**249,432**	**27,641**	**10,353,034**	**26,751,585**	.....	**368,779**

Industry in Canada, by Provinces, 1928

Gasolene	Kerosene	Fuel oil and diesel oil	Wood	Gas		Other fuel	Electricity purchased for power only	Total	Electricity generated	
				Manufactured	Natural				For own use	For sale
Imp. gal	Imp. gal.	Imp. gal.	Cords	M cu. ft.	M cu. ft.		K.W.H.		K.W.H.	K.W.H.
160,816	90	157,546	5,963	225,596	.....	.....	7,951,307	.....	77,226,074	1,660,657
36,568	24	23,411	25,088	18,047	.....	.....	198,689	2,391,558	.....	22,607
850	100	.....	10,545	.....	12,313	.....	262,080	.....	1,154,000	.....
229	24	.....	45,879	.....	3,045	.....	6,418	147,154	.....	.....
141,560	37,177	368,429	44,794	.....	.....	.....	801,098,212	.....	232,267,916	.....
40,774	7,986	35,802	221,463	.....	.....	.....	2,755,193	5,953,108	.....	.....
152,223	26,730	5,985,971	80,331	.....	95,466	.....	460,852,186	.....	8,926,858	145,705
36,566	6,999	500,445	418,929	.....	53,462	32,866	3,275,428	8,343,144	.....	2,914
34,287	1,675	101,600	29,458	.....	.....	.....	13,640,020	.....	.....	.....
15,424	606	42,512	170,520	.....	.....	.....	123,152	631,430	.....	.....
4,535	.....	272,613	2	.....	.....	.....	8,950	.....	1,000	.....
1,279	.....	22,421	24	.....	.....	.....	532	140,577	.....	.....
36,855	6,041	184,124	2,495	.....	2,432,185	.....	38,806,503	.....	17,873,454	1,142,637
11,209	2,142	15,464	11,054	.....	144,946	.....	393,284	1,386,358	.....	26,838
120,156	8,298	5,019,033	28,701	30,011	.....	.....	520,007,472	.....	82,420,516	1,354,067
38,333	2,361	316,027	105,705	3,717	.....	4,041	2,271,733	4,312,507	.....	27,082
15,193	.....	101,422	790	.....	.....	.....	4,764,440	.....	3,948,412	6,744,140
13,545	.....	49,714	15,237	.....	.....	.....	47,644	126,165	.....	67,741
666,475	**80,111**	**12,190,738**	**203,079**	**255,607**	**2,539,964**	.....	**1,856,391,170**	.....	**423,818,230**	**11,017,206**
193,927	**20,142**	**1,005,796**	**1,013,899**	**21,764**	**201,453**	**36,907**	**9,072,073**	**23,432,001**	.....	**147,182**

Table 37.—Fuel and Electricity Used in the Mineral

Province		Bituminous coal		Anthracite coal	Lignite coal		Coke
		Canadian	Imported		Canadian	Imported	
		Tons	Tons	Tons	Tons	Tons	Tons
Nova Scotia	Quantity	543,300	5	.....	.....	.....	2,660
	$	2,092,293	75	.....	.....	.....	13,280
New Brunswick	Quantity	18,004	.....	.....	.....	.....	28
	$	97,437	.....	.....	.....	.....	340
Quebec	Quantity	340,148	127,046	20,082	.....	1	12,658
	$	2,012,144	939,007	134,656	.....	16	134,480
Ontario	Quantity	1,483	807,713	3,753	.....	2	13,546
	$	9,300	4,622,410	29,251	.....	26	100,794
Manitoba	Quantity	1,945	68,035	160	126	.....	570
	$	17,638	560,154	1,600	1,058	.....	6,952
Saskatchewan	Quantity	7,233	.....	.....	56,108	.....	.....
	$	63,738	.....	.....	80,870	.....	.....
Alberta	Quantity	176,747	.....	.....	140,196	.....	4
	$	622,854	.....	.....	189,351	.....	40
British Columbia	Quantity	325,672	152	189	157	111	4,260
	$	1,502,001	2,451	2,940	1,338	1,177	44,106
Yukon	Quantity	3	.....	.....	.....	.....	.....
	$	15	.....	.....	.....	.....	.....
Canada	**Quantity**	**1,414,535**	**1,002,951**	**24,184**	**196,587**	**114**	**33,726**
	$	**8,417,420**	**6,124,097**	**168,447**	**272,617**	**1,219**	**299,992**

Industry in Canada, by Provinces, 1929

Gasolene	Kerosene	Fuel oil and diesel oil	Wood	Gas		Other fuel	Electricity purchased for power only	Total	Electricity generated	
				Manufactured	Natural				For own use	For sale
Imp. gal.	Imp. gal.	Imp. gal.	Cords	M cu. ft.	M cu. ft.		K.W.H.		K.W.H.	K.W.H.
150,206	1,409	104,756	5,422	395,759	.....	.....	9,822,335	.....	81,274,632	3,761,935
38,036	358	12,434	23,097	31,661	.....	.....	224,903	2,436,137	.....	27,169
4,856	786	18,823	15,752	.....	12,680	.....	120,528	.....	1,066,000	.....
1,319	230	2,183	60,432	.....	3,240	.....	3,619	168,830	.....	.....
193,281	18,124	631,740	48,917	.....	.....	.....	774,496,590	.....	154,606,482	.....
60,281	4,627	85,218	242,869	.....	.....	277	3,090,306	6,703,881	.....	.....
258,930	70,190	10,058,639	70,121	.....	84,101	.....	509,016,141	.....	14,590,545	2,805,900
69,423	12,110	815,179	367,068	.....	42,644	26,194	3,671,798	9,766,197	.....	28,059
48,685	2,584	180,000	32,135	.....	.....	.....	21,099,216	.....	.....	.....
17,230	895	55,886	172,128	.....	.....	.....	158,845	992,386	.....	.....
9,332	2,000	273,272	444	.....	.....	.....	48,631	.....	1,050,000	.....
2,698	600	22,527	1,698	.....	.....	.....	1,546	173,677	.....	.....
51,738	1,971	342,320	4,940	.....	6,412,116	.....	39,269,164	.....	13,022,478	1,264,252
16,034	564	26,027	22,226	.....	203,548	.....	395,824	1,476,468	.....	36,252
210,771	3,269	5,838,612	35,884	282,531	.....	.....	600,539,053	.....	75,377,897	31,927,736
69,423	1,220	348,525	128,650	34,751	.....	1,170	2,806,193	4,943,945	.....	253,649
16,424	.....	135,198	1,579	.....	.....	.....	.....	.....	10,056,413	2,365,008
13,343	.....	64,008	12,698	.....	.....	.....	.....	90,064	.....	23,650
944,173	**100,333**	**17,583,360**	**215,194**	**678,290**	**6,508,897**	.....	**1,954,411,658**	.....	**351,044,447**	**42,124,831**
287,817	**20,604**	**1,431,987**	**1,030,866**	**66,412**	**249,432**	**27,641**	**10,353,034**	**26,751,385**	.....	**368,779**

Table 38.—Power Employed in the Mineral Industry in Canada, by Provinces, 1929, with Comparative Totals for 1928

Province		Steam engines and turbines	Internal combustion 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	*Total electric motors*	Boilers
Nova Scotia	No.	102	61	3	*166*	233	**399**	341	*574*	157
	H.P.	59,235	4,114	585	*63,934*	7,220	**71,154**	34,927	*42,147*	38,637
New Brunswick	No.	42	39	.....	*81*	29	**110**	39	*68*	33
	H.P.	2,439	543	.....	*2,982*	634	**3,616**	800	*1,434*	2,218
Quebec	No.	64	66	15	*145*	2,229	**2,374**	119	*2,348*	121
	H.P.	3,465	2,359	51,835	*57,659*	106,441	**164,100**	3,943	*110,384*	7,694
Ontario	No.	220	257	16	*493*	4,275	**4,768**	193	*4,468*	256
	H.P.	16,118	8,481	5,308	*29,907*	209,489	**239,396**	5,233	*214,722*	26,765
Manitoba	No.	19	12	.....	*31*	268	**299**	13	*281*	21
	H.P.	995	1,097	–	*2,092*	9,591	**11,683**	385	*9,976*	1,450
Saskatchewan	No.	46	5	.....	*51*	9	**60**	34	*43*	30
	H.P.	2,932	278	.....	*3,210*	92	**3,302**	620	*712*	3,058
Alberta	No.	352	97	.....	*449*	793	**1,242**	387	*1,180*	316
	H.P.	41,262	2,196	.....	*43,458*	28,956	**72,414**	10,383	*39,339*	37,285
British Columbia	No.	159	136	75	*370*	2,736	**3,106**	914	*3,650*	173
	H.P.	39,149	9,223	43,476	*91,848*	161,009	**252,857**	36,182	*197,191*	28,022
Yukon	No.	.....	11	2	*13*	.....	**13**	29	*29*	3
	H.P.	.....	810	10,000	*10,810*	.....	**10,810**	439	*439*	165
Canada, 1929	**No.**	**1,004**	**684**	**111**	**1,799**	**10,572**	**12,371**	**2,069**	**12,641**	**1,110**
	H.P.	**165,595**	**29,101**	**111,204**	**305,900**	**523,432**	**829,332**	**92,912**	**616,344**	**145,294**
Canada, 1928	**No.**	**1,039**	**619**	**145**	**1,803**	**9,392**	**11,195**	**1,973**	**11,365**	**1,173**
	H.P.	**162,557**	**22,126**	**105,817**	**290,500**	**456,203**	**746,703**	**97,162**	**553,365**	**153,590**

Table 39.—Power Employed in the Mineral Industry in Canada by Industries, 1929, with Comparative Totals for 1928

Industry	Steam engines and turbines	Internal combustion 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	*Total electric motors*	Boilers
METAL MINING—									
Alluvial Gold.....No.	2	11	6	*19*	1	**20**	.....	*1*	1
H.P.	60	167	10,105	*10,332*	5	**10,337**	.....	*5*	20
Auriferous Quartz..No.	30	68	15	*113*	1,299	**1,412**	144	*1,443*	92
H.P.	1,795	7,097	4,942	*13,834*	65,216	**79,050**	4,713	*69,929*	7,072
Copper-Gold-Silver No.	10	42	17	*69*	532	**601**	120	*652*	27
H.P.	548	2,205	10,575	*13,328*	25,728	**39,056**	5,767	*31,495*	2,161
Silver-Cobalt.... No.	4	.....	.....	*4*	167	**171**	.....	*167*	15
H.P.	360	.....	.....	*360*	6,777	**7,137**	.....	*6,777*	1,255
Silver-Lead-Zinc..No	24	77	24	*125*	479	**601**	136	*615*	29
H.P.	7,420	5,891	3,119	*16,430*	15,678	**32,108**	3,146	*18,824*	4,511
Nickel-Copper....No.	.....	.....	.....	.....	257	**257**	.....	*257*	2
H.P.	.....	.....	.....	.....	24,111	**24,111**	.....	*24,111*	100
Miscellaneous.....No.	.....	1	.....	*1*	.....	**1**	.....	.....	3
H.P.	.....	110	.....	*110*	.....	**110**	.....	.....	105
Non-Ferrous Smelting and Refining....No.	26	7	21	*54*	3,228	**3,282**	436	*3,664*	43
H.P.	13,186	220	65,160	*78,566*	180,282	**258,848**	12,820	*193,102*	14,622
Total.....No.	**96**	**206**	**83**	**385**	**5,963**	**6,348**	**836**	**6,799**	**212**
H.P.	**23,369**	**15,690**	**93,901**	**132,960**	**317,797**	**450,757**	**26,446**	**344,243**	**29,846**
NON-METAL MINING INCLUDING FUELS—									
Fuels									
Coal.....No.	457	47	2	*506*	811	**1,317**	882	*1,693*	433
H.P.	113,741	380	12,000	*126,121*	27,336	**153,457**	57,369	*84,705*	78,617
Natural Gas.....No.	6	135	.....	*141*	6	**147**	14	*20*	9
H.P.	170	2,352	.....	*2,522*	33	**2,555**	208	*241*	310
Petroleum.....No.	108	66	.....	*174*	69	**243**	27	*96*	115
H.P.	6,233	1,839	.....	*8,072*	581	**8,653**	467	*1,048*	8,709
Total.....No.	*571*	*248*	*2*	*821*	*886*	*1,707*	*923*	*1,809*	*557*
H.P.	*120,144*	*4,571*	*12,000*	*136,715*	*27,950*	*164,665*	*58,044*	*85,994*	*87,636*
Other Non-Metal Mining									
Abrasives.....No.	11	2	.....	*13*	1	**14**	6	*7*	4
H.P.	495	70	.....	*565*	10	**575**	220	*230*	342
Asbestos.....No.	5	1	.....	*6*	573	**579**	.....	*573*	10
H.P.	1,120	6	.....	*1,126*	37,604	**38,730**	.....	*37,604*	1,315
Feldspar.....No.	8	8	.....	*16*	.....	**16**	.....	.....	7
H.P.	117	159	.....	*276*	.....	**276**	.....	.....	242
Gypsum.....No.	10	57	.....	*67*	175	**242**	13	*188*	14
H.P.	1,021	3,248	.....	*4,269*	6,406	**10,675**	505	*6,911*	1,180
Iron Oxides.....No.	.....	.....	.....	.....	5	**5**	.....	*5*	1
H.P.	.....	.....	.....	.....	118	**118**	.....	*118*	15
Mica.....No.	.....	.....	1	*1*	.....	**1**	.....	.....	2
H.P.	.....	.....	145	*145*	.....	**145**	.....	.....	80
Quartz.....No.	10	4	.....	*14*	10	**24**	.....	*10*	8
H.P.	407	231	.....	*638*	587	**1,225**	.....	*587*	707
Salt.....No.	8	2	.....	*10*	32	**42**	103	*135*	13
H.P.	185	330	.....	*515*	422	**937**	1,151	*1,573*	3,260
Talc and Soapstone.....No.	.....	.....	.....	.....	19	**19**	.....	*19*	1
H.P.	.....	.....	.....	.....	695	**695**	.....	*695*	80
Miscellaneous.....No.	6	9	1	*16*	13	**29**	11	*24*	18
H.P.	260	330	100	*690*	695	**1,385**	97	*792*	435
Total.....No.	*58*	*83*	*2*	*143*	*828*	*971*	*133*	*961*	*78*
H.P.	*3,605*	*4,374*	*245*	*8,224*	*46,537*	*54,761*	*1,973*	*48,510*	*7,656*
CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS—									
Cement.....No.	2	8	9	*19*	1,194	**1,213**	70	*1,264*	19
H.P.	2,000	278	4,000	*6,278*	72,454	**78,732**	2,800	*75,254*	3,647
Clay Products....No.	88	42	.....	*130*	569	**699**	21	*590*	101
H.P.	7,424	1,110	.....	*8,534*	19,823	**28,357**	497	*20,320*	8,925
Lime.....No.	12	6	1	*19*	237	**256**	31	*268*	10
H.P.	570	130	20	*720*	11,477	**12,197**	575	*12,052*	898
Sand and Gravel..No.	45	23	5	*73*	87	**160**	10	*97*	35
H.P.	2,691	662	350	*3,703*	2,705	**6,408**	328	*3,033*	1,610
Stone.....No.	132	68	9	*209*	808	**1,017**	45	*853*	98
H.P.	5,792	2,286	688	*8,766*	24,689	**33,455**	2,249	*26,938*	5,076
Total.....No.	**229**	**147**	**24**	**450**	**2,895**	**3,345**	**177**	**3,072**	**263**
H.P.	**18,477**	**4,466**	**5,058**	**28,001**	**131,148**	**159,119**	**6,449**	**137,597**	**20,156**
Grand total 1929...No.	**1,004**	**684**	**111**	**1,799**	**10,572**	**12,371**	**2,069**	**12,641**	**1,110**
H.P.	**165,595**	**29,101**	**111,204**	**305,900**	**523,432**	**829,332**	**92,912**	**616,341**	**145,294**
Grand total 1928...No.	**1,039**	**619**	**145**	**1,803**	**9,392**	**11,195**	**1,973**	**11,365**	**1,173**
H.P.	**162,557**	**22,126**	**105,817**	**290,500**	**456,203**	**746,703**	**97,162**	**553,365**	**153,590**

Table 40.—Principal Imports into Canada of Mineral Products during Calendar Years 1928 and 1929

Classification		1928		1929	
		Quantity	Value	Quantity	Value
			$		$
IRON AND ITS PRODUCTS—					
Iron ore	tons	2,222,897	4,325,159	2,447,807	5,026,265
Pigs, Ingots, Blooms and Billets—					
Pig iron	tons	48,504	791,733	36,451	624,891
Ferro-silicon and ferro-manganese	cwt.	127,606	485,740	183,176	587,152
Billets, not less than 60 lb. per lineal yard	cwt.	521,959	812,585	401,470	691,712
Other pigs, ingots, blooms and billets	cwt.	427,000	886,851	409,011	925,013
Total pigs, ingots, blooms and billets	$	.....	2,976,909	.....	2,828,828
Scrap iron or steel	tons	152,973	1,675,475	121,294	1,367,179
Castings and Forgings—					
Axles, parts and blanks	$	.....	1,516,504	.....	1,393,631
Locomotive and car wheel tires	cwt.	201,719	898,920	226,797	1,043,195
Other castings and forgings	$	.....	3,385,236	.....	3,386,452
Total castings and forgings	$	.....	5,800,660	.....	5,823,278
Rolling Mill Products—					
Band and hoop	cwt.	1,304,492	4,457,155	1,499,337	5,204,502
Bars and Rails—					
Railway rails	tons	31,181	974,866	28,379	944,965
Other bars and rails	cwt.	3,435,030	8,944,679	3,568,402	9,376,514
Plates and Sheets—					
Boiler plate	cwt.	229,345	541,404	239,293	614,819
Canada plates	cwt.	207,696	773,325	135,232	504,017
Tinned plates	cwt.	1,483,875	7,432,065	1,645,766	8,200,692
Plates not less than 30 in. by ¼ in., n.o.p.	cwt.	1,461,437	2,773,984	2,102,547	3,993,352
Sheets, No. 14 gauge and thinner, n.o.p.	cwt.	1,514,277	5,141,842	1,633,126	5,733,489
Galvanized, flat	cwt.	640,999	2,424,487	670,823	2,549,090
Galvanized, other	cwt.	4,380	15,967	3,515	11,399
Skelp, for pipe, etc.	cwt.	3,265,785	6,034,182	3,135,813	5,890,497
Other plates and sheets	cwt.	1,388,469	3,197,806	1,996,378	4,762,376
Rods	cwt.	1,044,375	1,543,172	999,991	1,663,801
Flat eye-bar blanks	tons	109	4,213	287	11,295
Bridges	$	.....	136,744	.....	179,293
Other structural iron	cwt.	5,403,700	10,438,621	7,608,060	15,106,537
Total rolling mill products	$	.....	54,834,512	.....	64,746,638
Tubes, Pipes and Fittings—					
Boiler tubes	$	.....	1,073,174	.....	1,164,570
Cast iron pipe	cwt.	125,880	218,377	101,260	209,703
Seamless tubing, not less 3½c. per lb.	cwt.	78,002	532,846	102,635	749,349
Other tubes, pipes, etc.	$	.....	2,503,062	.....	3,899,866
Total tubes, pipes and fittings	$	.....	4,327,459	.....	6,023,488
Wire—					
Barbed fencing	cwt.	102,994	326,428	94,781	297,883
Galvanized, No. 9, 12 and 13 gauge, not telegraph or telephone	cwt.	219,366	574,315	141,996	360,178
Steel wire for rope	cwt.	146,506	901,275	180,006	1,134,313
Wire rope, twisted wire, clothes lines, wire cable, etc., n.o.p.	$	.....	346,081	.....	490,577
Other	$	.....	1,484,717	.....	1,545,435
Total wire	$	.....	3,632,816	.....	3,828,386
Chains	$	.....	863,196	.....	1,043,015
Engines and Boilers—					
Engines, automobile	No.	117,007	11,503,741	88,841	9,183,357
Engines, internal combustion, other	No.	16,719	2,497,101	14,704	2,315,831
Locomotives and parts	No.	189	1,136,644	214	773,807
Other boilers, engines, etc.	$	.....	3,268,795	.....	5,501,354
Total engines and boilers	$	.....	18,406,281	.....	17,774,349
Farm Implements and Machinery—					
Cream separators	No.	20,575	878,006	18,269	793,338
Other dairy machinery	$	.....	222,174	.....	231,705
Harvesters	No.	7,573	2,008,141	5,286	5,016,421
Other harvesting implements and machinery	$	.....	535,845	.....	441,172
Planting and Tillage—					
Drills and parts	No.	6,256	839,587	6,327	986,456
Ploughs and parts	$	.....	2,037,884	.....	2,228,598
Other planting	$	.....	1,034,852	.....	1,085,508

Table 40.—Principal Imports into Canada of Mineral Products during Calendar Years 1928 and 1929—Continued

Classification		1928 Quantity	1928 Value	1929 Quantity	1929 Value
			$		$
IRON AND ITS PRODUCTS—Concluded					
Farm Implements and Machinery—*Concluded*					
Seed Separation—					
Threshing machine separators	No.	7,760	8,214,938	1,988	2,160,705
Threshing machine separator parts	$	.....	1,164,128	.....	634,379
Fanning mills	No.	2,717	73,502	1,321	30,616
Traction engines for farm purposes—					
Not over $1,400 each	No.	21,131	18,640,776	16,690	13,970,943
Other	No.	316	645,516	283	647,094
Farm tractor parts and repairs	$	.....	1,842,396	.....	2,271,479
Other farm implements	$	.....	1,755,745	.....	1,446,914
Total farm implements and machinery	$	.....	39,893,490	.....	31,845,326
Hardware and Cutlery—					
Cutlery	$	.....	1,742,346	.....	1,652,191
Hardware—					
Nails, wire	cwt.	14,506	48,035	13,002	46,985
Other nails, spikes, tacks	$	.....	39,770	.....	78,403
Needles and pins	$	.....	456,788	.....	520,699
Nuts and bolts	cwt.	46,322	508,683	52,334	578,066
Screws	$	.....	151,888	.....	251,471
Other hardware	$	.....	1,622,477	.....	1,985,348
Total hardware and cutlery	$	.....	4,569,987	.....	5,113,163
Machinery (Except Agricultural)—					
Sewing machines	No.	25,821	762,859	23,285	708,745
Sewing machine parts and attachments	$	.....	478,666	.....	477,216
Washing machines, domestic	No.	23,427	1,561,547	24,746	1,701,099
Other household machinery	$	.....	216,166	.....	309,287
Rock drills	No.	509	616,169	1,072	864,911
Other mining and metallurgical	$	.....	4,084,346	.....	9,935,397
Office or Business—					
Adding	No.	10,781	1,227,285	8,732	1,257,536
Typewriting	No.	19,021	1,027,847	21,336	1,062,329
Other	$	.....	690,171	.....	799,590
Printing and Book-Binding—					
Printing presses	$	.....	3,098,798	.....	2,597,365
Typesetting machines	$	.....	1,091,786	.....	1,139,559
Other printing and bookbinding	$	.....	1,035,876	.....	1,027,573
Coke and gas machinery	$	.....	691,970	.....	393,580
Cranes and derricks	No.	337	1,385,011	477	1,669,918
Logging equipment	$	.....	1,410,883	.....	1,458,092
Metal-working, n.o.p.	$	.....	4,449,849	.....	5,112,082
Paper and pulp mill	$	.....	2,399,212	.....	1,460,640
Pumps, power, and parts	No.	8,817	1,095,037	10,476	1,758,110
Rolling mill machines	$	.....	255,151	.....	1,050,618
Shovels, steam, electric or other power	No.	165	1,495,828	184	1,810,461
Textile	$	.....	4,690,356	.....	6,646,316
Other machinery	$	.....	23,377,638	.....	26,333,265
Total machinery (except agricultural)	$	.....	57,142,451	.....	69,574,589
Springs	$	.....	238,060	.....	313,359
Stamped and Coated Products—					
Tin cans	$	.....	518,047	.....	644,075
Other	$	.....	1,842,751	.....	1,986,528
Tools and hand implements	$	.....	2,971,011	.....	3,381,654
Vehicles—					
Automobiles, freight	No.	7,182	8,305,235	5,278	6,817,176
Automobiles, passenger	No.	40,226	32,527,041	39,446	32,605,958
Automobile parts	$	.....	48,839,955	.....	44,772,091
Railway cars, all kinds	No.	1,247	960,332	1,129	805,976
Railway cars, parts of	$	.....	965,590	.....	2,046,615
Other vehicles of iron	$	.....	1,870,486	.....	2,163,148
Total vehicles	$	.....	93,469,239	.....	89,210,964
Drums, tanks, cylinders	$	.....	1,380,998	.....	1,791,942
Furniture	$	.....	1,175,627	.....	1,551,060
Plates for agricultural implements	cwt.	37,174	179,092	10,588	45,894
Pumps, hand	No.	54,058	552,348	59,858	592,384
Stoves	$	.....	886,611	.....	837,471
Valves	$	.....	849,764	.....	1,364,147
Articles for shipbuilding	$	.....	1,480,077	.....	2,336,040
Other iron and steel	$	.....	18,971,590	.....	23,430,405
Total iron and its products	$	.....	**322,963,610**	.....	**342,480,427**

Table 40.—Principal Imports into Canada of Mineral Products during Calendar Years 1928 and 1929—Continued

Classification		1928		1929	
		Quantity	Value	Quantity	Value
			$		$
NON-FERROUS METALS—					
Alumina and bauxite	cwt.	3,275,154	4,336,782	2,853,874	3,227,754
Cryolite	cwt.	69,265	297,629	48,019	194,638
Aluminium ingots, sheets	lb.	1,396,210	415,809	1,552,048	471,127
Other aluminium	$	.....	1,674,908	.....	2,143,475
Brass—					
Scrap	cwt.	33,957	356,000	47,802	617,492
Bars and rods	cwt.	7,732	142,150	10,217	202,910
Strips, sheets, plates	cwt.	14,165	264,551	11,053	265,925
Tubing	lb.	3,322,210	748,869	4,074,669	1,020,931
Wire, plain	lb.	393,204	98,658	471,797	138,000
Wire cloth	$	.....	53,463	.....	63,895
Other	$	.....	4,477,291	.....	5,046,927
Total brass	$	.....	6,140,982	.....	7,356,080
Copper—					
Blocks, pigs, ingots	lb.	7,883,600	1,176,941	12,084,000	2,246,600
Scrap	cwt.	56,063	785,141	49,583	827,832
Bars and rods	cwt.	366,027	5,639,888	555,438	10,086,738
Strips, sheets, plates	cwt.	25,867	521,559	28,063	698,974
Tubing	lb.	2,549,901	602,730	2,662,706	721,369
Other	$	.....	2,005,099	.....	2,438,281
Total copper	$	.....	10,731,358	.....	17,019,794
Lead—					
Pigs, bars and sheets	lb.	577,920	36,646	1,423,840	84,922
Other	$	.....	365,664	.....	301,893
Nickel—					
Bars, rods, sheets, etc	lb.	730,106	240,378	1,243,865	388,296
Nickel-plated ware	$	.....	2,536,559	.....	3,319,624
Other	$	.....	571,660	.....	782,345
Precious Metals—					
Electro-plated ware	$	.....	1,282,513	.....	1,410,202
Silver in bars, blocks, etc	$	.....	984,547	.....	958,312
Other	$	.....	751,391	.....	877,327
Tin—					
Blocks, bars, pigs	cwt.	53,587	2,822,413	57,145	2,670,819
Foil	lb.	102,388	61,127	102,152	55,092
Other (collapsible tubes)	$	.....	44,655	.....	49,841
Zinc—					
Spelter	lb.	1,845,258	107,920	2,658,483	165,566
Sheets and plates	lb.	9,295,469	686,899	10,628,131	787,152
Other	$	.....	214,371	.....	206,966
Phosphor tin and bronze	lb.	772,565	299,578	841,824	340,660
Other alloys, n.o.p	$	.....	47,145	.....	50,186
Clocks and watches	$	.....	3,540,106	.....	3,608,898
Electric Apparatus—					
Batteries, storage	No.	33,278	598,754	23,369	573,295
Dynamos, generators	$	.....	1,441,735	.....	2,093,353
Incandescent lamps—					
Carbon filament	No.	1,239,055	64,594	1,403,651	131,070
Metal filament	No.	1,770,970	138,244	695,928	87,902
Electric light fixtures	$	.....	1,008,992	.....	1,217,435
Meters	$	.....	396,900	.....	399,267
Motors	$	.....	3,826,192	.....	4,944,231
Spark plugs, etc	$	.....	875,831	.....	1,280,590
Switches, etc	$	.....	1,571,622	.....	2,236,688
Telegraph instruments	$	.....	388,717	.....	787,994
Telephone instruments	$	.....	1,488,427	.....	2,551,588
Wireless apparatus	$	.....	5,090,239	.....	10,198,060
Other	$	.....	7,015,182	.....	10,338,060
Totsl electric apparatus	$	.....	23,905,429	.....	36,839,533
Gas apparatus	$	.....	253,081	.....	298,289
Printing materials (except machinery)—					
Stereotypes	sq. in.	6,313,103	320,332	6,105,678	351,776
Other	$	.....	130,942	.....	123,828
Manganese oxide	cwt.	2,128,861	1,058,824	1,982,782	990,608
Ores, n.o.p	cwt.	751,177	826,278	208,919	358,639
Antimony, not ground	lb.	1,529,823	140,958	1,746,525	147,643
Mercury	lb.	199,603	269,746	346,701	478,048
Lamps, sidelights, etc	$	.....	1,389,745	.....	1,737,881
Other non-ferrous metals	$	.....	2,453,007	.....	2,888,760
Total non-ferrous metals	$	.....	**68,939,379**	.....	**90,686,274**

Table 40.—Principal Imports into Canada of Mineral Products during Calendar Years 1928 and 1929—Continued

Classification		1928 Quantity	1928 Value	1929 Quantity	1929 Value
			$		$
NON-METALLIC MINERALS—					
Asbestos other than crude	$	.....	835,887	.....	1,013,436
Clay and Clay Products—					
China clay	cwt.	462,357	262,207	497,571	292,980
Fireclay	cwt.	1,219,155	266,320	1,521,282	322,508
Other clays	$	.....	96,907	.....	167,641
Bricks, building	M	14,513	246,723	15,678	291,370
Bricks, fire	$	.....	1,829,380	.....	2,565,114
Brick and tile, n.o.p.	$	.....	886,796	.....	1,240,131
Pottery and chinaware	$	.....	4,782,242	.....	5,484,104
Artificial teeth	$	.....	445,609	.....	461,832
Bath tubs, etc.	$	.....	573,604	.....	638,874
Other	$	.....	633,959	.....	695,012
Total clay and clay products	$	.....	10,023,747	.....	12,159,566
Coal and Coal Products—					
Coal, anthracite	tons	3,748,816	27,680,018	4,019,917	28,809,792
Coal, bituminous	tons	12,761,484	25,385,242	13,707,543	26,259,704
Coal for ships' stores	tons	684,461	1,229,185	462,595	881,264
Coal tar, crude	gal.	6,003,182	438,244	6,429,566	518,878
Carbolic oil	gal.	1,803,659	346,428	2,398,042	445,321
Coke	tons	1,060,029	6,102,842	1,226,853	6,659,514
Lignite and coal products, n.o.p.	$	.....	69,436	.....	77,852
Total coal and coal products	$	.....	61,251,395	.....	63,652,325
Glass and Glassware—					
Carboys, bottles, jars, etc. (including milk bottles)	$	.....	1,509,584	.....	1,714,746
Tableware	$	.....	1,041,826	.....	1,110,456
Incandescent lamp bulbs and tubing for	$	.....	563,147	.....	595,113
Common window glass	sq. ft.	45,509,833	1,179,052	51,389,896	1,550,939
Plate glass—					
Not over 7 sq. ft.	sq. ft.	4,743,644	1,343,920	5,004,282	1,433,703
7 to 25 sq. ft.	sq. ft.	944,502	336,891	1,060,294	383,250
Other, not bevelled	sq. ft.	1,338,273	530,101	1,600,167	628,166
Other glass and glassware	$	.....	2,789,574	.....	3,153,084
Total glass and glassware	$	.....	9,294,095	.....	10,569,457
Graphite and products	$	.....	128,026	.....	155,770
Petroleum, Asphalt and Their Products—					
Asphalt, solid	cwt.	959,811	822,425	1,075,002	829,328
Other asphalt and oil	$	.....	142,452	.....	123,152
Crude Petroleum—					
Natural, for refining	gal.	853,889,703	35,237,350	1,060,000,971	46,154,347
Other, for refining	gal.	263,771	26,378	5,726,147	376,001
Other, ·8235 and heavier	gal.	62,680,093	2,452,504	63,264,841	2,444,259
Fuel oil for ships' stores	gal.	32,539,383	981,622	32,302,642	868,925
Coal and kerosene oil, refined	gal.	3,904,692	354,927	4,523,347	399,724
Gasoline—					
Under ·725 specific gravity	gal.	116,062,590	13,526,618	135,558,099	15,096,277
Other	gal.	27,590,526	3,285,800	39,592,871	4,707,809
Lubricating oil	gal.	15,487,945	4,502,463	17,401,194	5,444,947
Other oils	$	.....	239,503	.....	242,537
Other petroleum products	$	.....	1,062,824	.....	1,152,104
Total petroleum, asphalt and their products	$	.....	62,634,866	.....	77,839,410
Stone and Its Products—					
Abrasives	$	.....	4,129,225	.....	4,508,916
Building and paving stone	$	.....	672,245	.....	894,118
Cement	cwt.	119,166	146,164	195,929	189,169
Silica sand	cwt.	3,087,676	332,338	4,679,252	490,558
Whiting	cwt.	342,034	200,760	350,098	203,035
Marble, slate and other	$	.....	2,356,480	.....	2,774,122
Total stone and its products	$	.....	7,837,212	.....	9,059,918
Miscellaneous—					
Carbons, electric	$	.....	480,334	.....	473,383
Diamonds, unset	$	.....	3,402,993	.....	3,633,830
Insulators, electric	$	.....	429,529	.....	465,578
Salt	cwt.	3,780,510	1,122,968	3,531,300	936,820
Sulphur	cwt.	3,646,860	2,962,935	4,698,520	3,789,243
Other non-metallic minerals	$	.....	1,768,440	.....	2,173,063
Total non-metallic minerals	$	.....	**162,172,427**	.....	**185,921,799**

Table 40.—Principal Imports into Canada of Mineral Products during Calendar Years 1928 and 1929—Concluded

Classification		1928		1929	
		Quantity	Value	Quantity	Value
			$		$
CHEMICALS AND ALLIED PRODUCTS—					
Acid, citric	lb.	351,385	152,930	322,494	150,497
Acid, stearic	lb.	1,536,832	168,370	2,166,794	275,818
Other acids	$	.....	683,718	.....	804,984
Alcohols, industrial	gal.	9,479	20,809	38,651	66,392
Cellulose products	$	.....	2,519,085	.....	2,775,840
Drugs and medicinal preparations	$	.....	3,715,028	.....	3,730,193
Dyeing and Tanning Materials—					
Aniline and coal tar dyes	lb.	3,080,740	1,775,977	3,015,457	1,811,748
Coal tar dye products, n.o.p.	lb.	571,487	117,932	923,261	167,214
Logwood, oak, quebracho extracts	lb.	44,198,159	1,725,895	31,077,418	1,191,386
Other dyeing and tanning articles	$	.....	473,777	.....	475,320
Total dyeing and tanning materials	$	.....	4,093,581	.....	3,645,668
Explosives	$	.....	606,713	.....	587,311
Fertilizers, n.o.p.—					
Potash, muriate of	cwt.	477,101	842,988	340,024	611,121
Soda nitrate	cwt.	535,606	1,204,017	677,558	1,419,647
Superphosphates	cwt.	1,949,789	1,188,537	1,958,501	1,147,839
Other	$	.....	1,784,299	.....	1,433,116
Total fertilizers, n.o.p.	$	.....	5,019,841	.....	4,611,723
Paints, Pigments and Varnishes—					
Litharge	cwt.	39,773	279,136	55,922	423,261
Lead, red	lb.	1,469,943	100,733	1,791,872	134,685
Black, carbon	lb.	12,940,270	853,230	14,620,572	1,014,140
Blacks, other	lb.	1,815,546	132,543	1,444,378	111,466
Lithopone	lb.	16,287,182	717,207	19,408,436	852,079
Oxide of cobalt, etc	lb.	266,749	133,818	288,694	124,748
Oxides, fireproofs	lb.	6,969,104	709,539	7,365,868	790,654
Zinc white	lb.	18,128,357	1,166,491	19,052,472	1,248,668
Liquid fillers, etc	gal.	.....	579,877	495,436	635,735
Varnish, lacquers, etc	gal.	137,727	246,120	144,369	259,765
Other paints, etc	$	.....	630,787	.....	625,959
Total paints, pigments and varnishes	$	.....	5,549,481	.....	6,221,160
Perfumery, Cosmetics—					
Perfumes over 4 oz	gal.	2,914	124,023	2,693	109,167
Other	$	.....	1,278,816	.....	1,388,371
Soap—					
Castile	lb.	1,221,382	98,322	1,237,860	93,264
Common laundry	lb.	9,320,902	697,584	11,485,386	860,509
Other	$	.....	371,004	.....	352,415
Inorganic Chemicals, n.o.p.—					
Alum in bulk	cwt.	40,310	57,332	34,296	47,070
Sulphate of alumina	cwt.	441,244	521,903	522,966	611,244
Ammonia, nitrate of	lb.	3,873,554	147,924	4,989,868	187,433
Sal ammoniac	lb.	3,615,678	143,701	3,455,465	135,585
Copper sulphate	lb.	5,369,045	274,645	4,370,426	236,693
Chlorine, liquid	lb.	5,327,349	186,734	7,012,430	210,128
Chloride of lime	lb.	12,782,907	202,674	7,862,413	123,427
Potash compounds	lb.	4,459,110	465,353	6,189,559	561,714
Soda compounds	lb.	272,405,089	3,465,965	374,894,378	4,508,244
Acid phosphate	lb.	3,263,291	245,518	2,982,679	223,157
Other	$	.....	1,086,542	.....	1,454,915
Total inorganic chemicals, n.o.p.	$	.....	6,798,291	.....	8,299,610
Other Drugs, Dyes and Chemicals—					
Glycerine	lb.	5,702,244	597,982	8,328,212	736,747
Other chemicals and allied products	$	.....	4,468,116	.....	5,421,509
Total chemicals and allied products	$	.....	**36,963,694**	.....	**40,131,178**

Table 41.—Principal Exports of Canadian Mineral Products during the Calendar Years 1928 and 1929

Classification		1928		1929	
		Quantity	Value	Quantity	Value
			$		$
IRON AND ITS PRODUCTS—					
Ore, including chromite	tons	2,615	12,500	3,859	19,461
Pigs, Ingots, Blooms and Billets—					
Pig Iron	tons	1,168	20,642	8,375	151,967
Ferro-manganese and ferro-silicon	tons	43,830	3,071,567	69,099	4,816,930
Billets, ingots and blooms	tons	1,304	30,949	520	14,558
Total pigs, ingots, blooms and billets	$	.....	3,123,158	.....	4,983,455
Scrap iron	tons	86,687	954,363	138,372	1,583,830
Castings	$	.....	84,905	.....	260,049
Forgings	$	.....	4,483	.....	2,767
Rolling Mill Products—					
Bars and rods	tons	25,917	870,390	15,312	599,489
Plates and sheets	tons	216	13,625	138	12,014
Rails	tons	6,632	220,093	19,678	659,940
Structural steel	tons	278	31,305	812	115,699
Total rolling mill products	$	.....	1,135,413	.....	1,387,142
Pipe and Tubing	$	.....	1,845,010	.....	2,567,033
Wire—					
Barbed	cwt.	30,701	103,182	31,236	110,385
Woven fencing	$	.....	118,129	.....	127,879
Other	$	.....	699,850	.....	738,356
Engines and Boilers—					
Locomotives and parts	No.	2	77,667	2	114,913
Other	$	.....	177,456	.....	273,105
Farm Implements and Machinery—					
Cream separators	$	.....	44,709	.....	54,692
*Milking machines and parts	No.	.....	231,997	.....	696,730
Harvesters	No.	9,756	1,705,599	14,348	2,455,601
Hay rakes	No.	2,628	88,778	4,994	189,190
Mowers	No.	10,950	658,296	13,142	788,247
Reapers	No.	1,882	172,471	393	29,584
*Reaper threshers	No.	1,721	1,610,975	3,203	3,532,678
Cultivators	No.	15,921	932,240	17,529	625,348
Drills	No.	5,687	949,846	5,945	980,675
Harrows	$	.....	450,574	.....	610,754
Ploughs	$	.....	2,739,923	.....	4,821,266
Threshing machines	$	.....	472,304	.....	572,046
Spades and shovels	$	.....	321,561	.....	216,584
Other	$	.....	691,260	.....	959,742
Parts	$	.....	3,385,285	.....	3,302,609
Total farm implements and machinery	$	.....	14,455,728	.....	19,835,746
Hardware and Cutlery—					
Razors and razor blades	$	.....	904,782	.....	563,174
Nails, wire	cwt.	75,266	260,540	60,166	211,265
Nails, other	cwt.	18,414	133,690	23,821	145,169
Needles and pins	$	.....	567,286	.....	525,157
Bolts and nuts	cwt.	9,611	63,900	9,792	68,200
Other hardware	$	.....	259,896	.....	303,561
Machinery—					
Electric vacuum cleaners	No.	39,462	1,660,809	44,956	1,909,921
Sewing machines	$	.....	4,468,956	.....	3,452,283
Adding machines	No.	3,839	397,689	4,164	408,645
Typewriters	No.	1,067	48,075	1,384	78,120
Metal-working	$	.....	263,120	.....	70,352
Wood-working	$	.....	21,262	.....	63,976
Other machinery	$	.....	712,018	.....	1,162,787
Total machinery	$	.....	7,571,929	.....	7,146,084
Axes*	doz.	3,905	33,756	4,304	36,973
Tools, hand or machine	$	.....	239,370	.....	253,818
Vehicles—					
Automobiles, freight—					
One ton or less	No.	19,921	7,038,401	25,040	9,749,435
Over one ton	No.	3,735	1,613,900	11,808	5,081,571
Automobiles, passenger—					
$500 or less	No.	42,308	14,827,725	45,852	17,325,333
$500 to $1,000	No.	10,729	7,125,407	17,873	11,120,159
Over $1,000	No.	2,695	3,270,882	1,138	1,378,941
Total automobiles	No.	79,388	33,876,315	.....	44,655,439

*April 1st to December 31st, 1928.

Table 41.—Principal Exports of Canadian Mineral Products during the Calendar Years 1928 and 1929—Continued

Classification		1928 Quantity	1928 Value	1929 Quantity	1929 Value
			$		$
IRON AND ITS PRODUCTS—Concluded					
Vehicles—Concluded					
Automobile parts	$	.....	2,152,166	.....	2,350,232
Railway cars and parts	$	.....	283,101	.....	32,337
Tractors and parts	No.	40	38,435	12	13,913
Other vehicles of iron	$	.....	110,465	.....	102,444
Total vehicles	$	.....	36,460,482	.....	47,154,365
Chains	$	.....	157,298	.....	172,434
Stoves	$	.....	124,326	.....	156,852
Other iron and steel	$	.....	1,096,578	.....	1,360,392
Total iron and its products	$	.....	**70,665,677**	.....	**90,101,565**
NON-FERROUS METALS—					
Aluminium—					
Scrap	cwt.	18,003	249,066	34,162	455,326
Bars, blocks, etc.	cwt.	405,971	8,049,367	729,708	13,210,023
Manufactures	$	.....	759,258	.....	1,479,160
Brass—					
Old and scrap	cwt.	115,482	984,071	119,185	1,206,510
Valves	$	.....	261,419	.....	282,429
Other	$	.....	603,544	.....	908,760
Copper—					
Fine, in ore, matte, regulus	cwt.	764,279	7,023,884	869,991	8,944,965
Blister	cwt.	1,047,647	15,375,344	1,482,785	26,711,867
Old and scrap	cwt.	80,617	869,839	115,596	1,574,712
Bars	cwt.	1,582	40,988	1,321	35,900
Wire, insulated	$	.....	259,430	.....	119,030
Other	$	.....	25,930	.....	13,522
Total copper	$	.....	23,595,415	.....	37,399,996
Lead—					
In ore	cwt.	149,629	893,709	159,768	1,047,441
Pig	cwt.	2,554,217	10,172,075	2,283,741	10,053,402
Nickel—					
In matte	cwt.	363,708	5,457,222	296,307	4,501,389
Nickel oxide	cwt.	96,072	3,004,951	116,009	3,489,782
Fine	cwt.	511,887	13,320,034	684,082	17,544,513
Precious Metals—					
Gold-bearing quartz, dust, etc.	$	.....	10,457,877	.....	29,995,983
Silver in ore, concentrates, etc.	oz.	6,815,691	3,824,385	7,058,275	3,736,204
Silver bullion	oz.	14,805,993	8,579,968	14,879,770	8,022,917
Other	$	.....	542,310	.....	649,161
Total precious metals	$	.....	23,404,540	.....	42,404,265
Zinc—					
Ore	tons	†11,255	1,438,619	12,869	1,415,725
Spelter	cwt.	1,271,885	6,602,867	1,350,857	7,031,645
Scrap, dross and ashes	cwt.	69,440	203,884	76,382	262,719
Clocks and watches	$	.....	173,972	.....	228,771
Miscellaneous—					
Electric apparatus	$	.....	2,218,616	.....	2,643,526
Cobalt ore	$	.....	530,897	.....	484,491
Cobalt, metallic	lb.	240,966	467,663	315,700	608,444
Ores, n.o.p.	tons	15	687	469	44,424
Other non-ferrous metals	$	.....	1,019,737	.....	1,461,397
Total non-ferrous metals	$	.....	**103,411,613**	.....	**148,164,138**
NON-METALLIC MINERALS—					
Asbestos	tons	129,192	8,802,558	143,725	10,127,208
Asbestos sand	tons	135,729	2,177,729	148,305	2,507,474
Asbestos mfrs	$	.....	65,895	.....	113,952
Porcelain insulators	$	.....	124,140	.....	268,109
Other clay and products	$	.....	160,378	.....	107,397
Coal (incl. lignite)	tons	863,941	4,469,999	842,972	4,375,328

*1927—Zinc ore exported.
†1928—Zinc contained in ore exported.

Table 41.—Principal Exports of Canadian Mineral Products during the Calendar Years 1928 and 1929—Concluded

Classification		1928 Quantity	1928 Value	1929 Quantity	1929 Value
			$		$
NON-METALLIC MINERALS—Con.					
Coal Products—					
Cinders	$	.....	11,713	.....	2,516
Coke	tons	44,915	625,862	53,130	732,489
Tar	gal.	3,572,781	311,031	3,069,247	140,541
Glass and glassware	$	.....	150,205	.....	100,507
Graphite	cwt.	21,065	45,384	31,643	88,647
Mica splittings	cwt.	1,679	80,902	1,822	96,726
Other mica	$	.....	94,859	.....	116,333
Petroleum and its Products—					
Petroleum, crude	gal.	21,531,929	1,098,586	28,177,495	1,548,288
Kerosene, refined	gal.	1,297,081	127,391	1,367,241	137,160
Gasoline and naphtha	gal.	3,957,557	686,256	4,669,078	875,027
Other oil	gal.	279,946	85,014	433,634	105,426
Wax	cwt.	10,010	54,501	11,556	62,171
Stone and its Products—					
Abrasives, artificial	cwt.	1,235,302	3,295,460	1,571,816	3,815,804
Grindstones	$	.....	28,747	.....	36,536
Gypsum, crude	tons	824,536	1,240,987	893,445	1,086,939
Lime	cwt.	400,852	357,085	484,769	428,209
Cement, portland	cwt.	935,638	340,624	819,389	252,955
Feldspar	tons	28,101	230,945	29,896	242,915
Sand and gravel	tons	797,111	232,422	1,903,312	441,798
Talc, refined	cwt.	218,915	133,601	227,988	139,096
Other	$	.....	506,122	.....	564,765
Other non-metallic minerals	$	.....	856,964	.....	1,045,137
Total non-metallic minerals	$	.....	**26,395,420**	.....	**29,559,453**
CHEMICALS AND ALLIED PRODUCTS—					
Acid, sulphuric	cwt.	266,586	152,544	167,938	91,634
Acids, other	cwt.	417,224	3,938,879	583,682	4,782,526
Wood alcohol	gal.	27,380	23,514	31,193	30,092
Other industrial spirits	$	.....	21,090	.....	7,964
Drugs, medicinal	$	.....	590,049	.....	808,981
Dyeing and tanning materials	$	.....	1,192	.....	486
Explosives	$	.....	218,324	.....	235,132
Fertilizers—					
Ammonium sulphate	cwt.	272,637	561,696	489,782	909,510
Cyanamid	cwt.	2,710,526	4,759,810	3,858,586	6,436,519
Other mfd., n.o.p.	cwt.	45,710	49,330	85,782	106,695
Paints, pigments and varnishes	$	.....	592,970	.....	490,426
Soap, toilet	lb.	4,996,008	662,973	5,253,717	720,743
Soap, n.o.p.	lb.	416,405	33,539	490,584	37,813
Inorganic Chemicals, n.o.p—					
Arsenic, n.o.p.	cwt.	31,949	122,106	31,673	123,398
Acetate of lime	cwt.	99,365	356,845	83,987	366,815
Calcium carbide		.....	837,912	.....	684,900
Soda and sodium compounds	cwt.	639,294	3,711,376	943,504	4,256,621
Cobalt oxide and salts	lb.	369,783	650,981	236,873	450,870
Other	$	.....	134,151	.....	101,457
Total inorganic chemicals, n.o.p.	$	.....	5,813,371	.....	5,984,061
Creosote oil	gal.	1,150,766	188,191	1,025,223	150,543
Glycerine	cwt.	3,137	23,448	13,064	68,101
Other drugs, dyes and chemicals	$	.....	1,003,914	.....	1,117,013
Total chemicals and allied products	$	.....	**18,544,836**	.....	**21,988,239**

Table 41A.—Canada's Foreign Trade in Mineral Products, showing the Values by Countries, of Imports into Canada for Consumption and Exports of Canadian Merchandise, of the Principal Classes of Mineral Products, during the Calendar Year 1929.

Country	Iron and its products		Non-ferrous metals and their products		Non-metallic minerals and their products (except chemicals)		Chemicals and allied products	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
British Empire	$	$	$	$	$	$	$	$
United Kingdom	22,272,090	7,841,850	7,103,049	15,328,746	13,207,944	2,170,488	5,502,453	4,729,616
Irish Free State	20,142	42,892	250	15,309	243	5,996	.....	20,621
Aden	.....	48,450	.....	.....	.....	.....	.....	.....
Africa—								
British East	.....	1,224,881	.....	3,056	.....	2,648	585	632
British South	19	5,901,472	.....	354,335	20,506	92,870	.....	40,116
British West—								
Gambia	.....	20,642	.....	.....	.....	.....	.....	.....
Gold Coast	.....	522,758	918,448	.....	.....	264	.....	1,378
Nigeria	.....	156,967	.....	314	.....	10	.....	280
Sierre Leone	.....	37,969	.....	50	.....	.....	.....	.....
Other Br. W. Africa	.....	.....	.....	.....	.....	.....	.....	30
Bermuda	10,632	38,364	550	4,442	93	32,435	.....	34,498
Br. East Indies—								
British India	6,298	3,621,252	65,558	3,568,246	58,269	26,052	5,832	133,048
Ceylon	271	327,197	166	17,520	.....	1,340	.....	42,557
Straits Settlements	.....	668,113	347,153	42,696	.....	3,946	.....	1,740
Other Br. East Indies	.....	4,991	.....	.....	.....	.....	.....	.....
British Guiana	50,940	86,296	89,452	18,571	.....	43,682	.....	55,308
British Honduras	1,260	17,370	163	1,074	.....	6,859	.....	7,706
British Sudan	.....	70,225	.....	4,350	.....	.....	.....	.....
Br. West Indies—								
Barbados	14,781	61,411	4,330	3,509	.....	19,947	.....	93,423
Jamaica	.....	522,413	.....	8,012	1	6,912	11,871	64,493
Trinidad and Tobago	9,714	476,895	.....	22,504	.....	20,904	.....	84,912
Other Br. West Indies	14,997	100,261	6,204	9,949	87,827	30,822	1,244	68,121
Gibraltar	.....	.....	.....	.....	.....	8,010	.....	.....
Hong Kong	1,326	140,460	1,647	7,639	6,447	.....	90,612	104,249
Iraq (Mesopotamia)	.....	72,386	.....	.....	.....	.....	.....	.....
Malta	.....	167,213	.....	568	.....	.....	.....	.....
Newfoundland	811,313	1,600,762	3,966	185,730	193,826	1,973,226	251	572,460
Oceania—								
Australia	467	8,871,387	485	369,473	132	331,010	1,879	230,742
Fiji	.....	107,160	302	1,674	.....	1,880	.....	267
New Zealand	141	9,245,195	376	937,453	140	267,609	5,874	174,231
Other Oceania	.....	29,332	.....	52	.....	.....	.....	.....
Palestine	252	43,457	111	58	80	300	29	319
Total British Empire	23,214,643	42,070,021	8,542,210	20,905,330	13,575,508	5,047,210	5,620,630	6,460,747
Foreign Countries								
Argentina	1,182	12,053,223	20	649,281	.....	7,430	14,264	2,065
Austria	32,547	31,143	85,576	38,286	9,684	.....	3,074	.....
Belgium	3,707,357	591,638	490,064	2,074,869	4,736,705	1,030,292	495,816	889
Bolivia	.....	108,361	.....	1,599	.....	.....	.....	624
Brazil	.....	2,499,316	.....	532,864	445	51,947	.....	4,596
Chile	.....	1,824,564	.....	61,095	.....	5,347	606,337	11,459
China	5,811	362,477	67,081	4,352,453	10,598	42,464	25,553	129,076
Colombia	.....	238,825	.....	46,356	5,745,438	83,011	.....	22,504
Costa Rica	.....	34,045	.....	1,498	.....	814	.....	4,056
Cuba	.....	25,016	.....	53,394	.....	5,615	.....	171,677
Czecho-Slovakia	73,011	35,931	87,233	10,186	957,515	.....	22,721	.....
Denmark	22,663	215,350	9,100	82,257	8,383	26,363	5,888	155
Ecuador	.....	87,821	.....	413	.....	.....	.....	.....
Egypt	.....	605,435	51	328	35	.....	.....	1,414
Esthonia	.....	2,679	.....	.....	.....	.....	.....	.....
Finland	25,342	36,944	.....	.....	31,026	80	5	.....
France	613,433	872,266	422,552	2,571,105	857,996	650,394	1,413,365	17,360
French Africa	10	622,744	20	125	.....	.....	.....	.....
French West Indies	.....	48,371	.....	21	.....	16,862	.....	147
St. Pierre and Miquelon	630	51,812	231	4,720	.....	82,659	.....	9,449
Germany	3,421,559	1,207,406	1,444,510	7,225,348	1,440,072	1,316,435	2,910,027	8,953
Greece	.....	50,598	.....	4,086	59	8,097	.....	.....
Guatemala	.....	72,818	.....	1,902	.....	5,739	.....	67
Hayti	.....	62,340	.....	934	.....	.....	.....	207
Honduras	.....	29,483	.....	.....	.....	14,185	.....	45,358
Italy	18,712	162,360	85,499	454,152	267,058	260,753	125,664	180
Japan	14,451	627,216	230,742	8,752,793	532,734	572,054	117,336	758,313
Korea	578	9,739	1,090	.....	.....	.....	.....	14,708
Lettonia (Latvia)	.....	3,180	.....	.....	.....	.....	.....	.....
Mexico	.....	78,871	.....	571,903	220	21,377	.....	1,403,930
Morocco	.....	163,015	.....	78	.....	.....	.....	.....
Netherlands	131,879	250,158	84,113	4,340,866	744,549	161,907	1,007,156	1,524
Dutch East Indies	.....	1,769,602	.....	45,501	.....	12,529	.....	40,222
Dutch Guiana	.....	2,414	28,135	.....	.....	.....	.....	1,142
Dutch West Indies	.....	75,416	.....	207	420,151	.....	.....	2,677

Table 41A.—Canada's Foreign Trade in Mineral Products, showing the Values by Countries, of Imports into Canada for Consumption and Exports of Canadian Merchandise, of the Principal Classes of Mineral Products, during the Calendar Year 1929.— Concluded.

Country	Iron and its products		Non-ferrous metals and their products		Non-metallic minerals and their products (except chemicals)		Chemicals and allied products	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
FOREIGN COUNTRIES—*Con.*	$	$	$	$	$	$	$	$
Norway	58,046	145,410	1,144	10,055	2,135	136,826	91	.....
Panama	.....	396,058	.....	273	.....	13,378	.....	5,004
Paraguay	.....	58,220	.....	.....	.....	.....	.....	.....
Persia	.....	147,824	134	.....	.....	.....	.....	355
Peru	5,467	787,580	.....	11,483	6,236,542	19,768	.....	18,021
Poland and Danzig	3,816	35,092	140	99,664	.....	6,502	.....	.....
Portugal	.....	292,733	.....	2,697	532	.....	.....	.....
Azores and Madeira	.....	2,057	.....	234	6	.....	.....	.....
Portuguese Africa	.....	299,008	.....	5,076	.....	3,126	.....	450,741
Roumania	.....	477,934	.....	3,913	25	.....	.....	350
Russia	.....	2,058,101	.....	139,137	692,691	.....	.....	31
San Domingo	.....	5,078	.....	9,540	.....	.....	.....	9,188
Siam	.....	181,060	.....	4,814	.....	.....	.....	.....
Spain	17,918	2,553,968	112,936	152,162	48,875	29,292	32,116	76,043
Sweden	1,519,742	371,462	215,851	134,006	38,846	39,067	34,239	.....
Switzerland	159,038	19,334	1,826,699	606,317	16,086	892	287,544	150
Syria	364	177,766	1,766	500	15	1,740	5,336	287
Turkey	.....	69,596	364	.....	30	4,352	.....	.....
United States	309,421,260	13,250,523	76,757,624	94,155,696	149,531,567	19,645,319	27,403,857	11,985,642
Alaska	7,151	1,576	13,957	555	1,862	378,070	143	94
Hawaii	3,529	69	50	.....	100	15	.....	84
Philippine Islands	.....	124	.....	98	.....	15,470	.....	7,842
Porto Rico	.....	2,193	.....	.....	.....	25	.....	44,083
Uruguay	.....	462,859	.....	15,070	.....	.....	.....	1,912
Venezuela	.....	648,996	.....	21,195	.....	511	.....	103,134
Other Foreign Countries	88	674,336	177,382	7,700	14,311	2,049	16	11,176
Total Foreign Countries	319,265,784	48,031,544	82,144,064	127,258,808	172,346,291	24,672,786	34,510,548	15,366,949
Grand Total	**342,480,427**	**90,101,565**	**90,686,274**	**148,164,138**	**185,921,799**	**29,719,996**	**40,131,178**	**21,827,696**

UNITED STATES TARIFF RATES ON MINERAL PRODUCTS IMPORTED

Since Canadian producers of mineral products market a large part of their annual output in the United States it was thought it might be of value to readers of this report to have at hand a guide to *United States Tariff* and the following tables were therefore compiled. These have been checked by the *Customs Division* of the *United States Treasury Department* at Washington, D.C., U.S.A.

Table 42.—United States Tariff

U. S. Tariff Paragraph No.	Material	Duty
	(a) On Metals and Manufactures of	
1508	Antimony ore	Free
1547	Chromite—Chromite or chrome ore	Free
1550	Cobalt metal and ore	Free
29	Cobalt linoleate	10c. per lb.
29	Cobalt, oxide of	20c. per lb.
29	Cobalt salts and compounds (all other)	30% ad val.
29	Cobalt sulphate	10c. per lb.
1457	Cobalt ore waste	10% ad val.
1556	Copper ore, regulus of, and black or coarse copper, and cement copper, old copper, fit only for re-manufacture, copper scale, clippings from new copper, and copper in plates, bars, ingots, or pigs not manufactured or specially provided for	Free
1557	Copper sulphate or blue vitriol, copper acetate and subacetate	Free
381	Copper in rolls, rods or sheets	2½c. per lb.
	Engraver plates, not ground and seamless copper tubes and tubing	7c. per lb.
	Engravers plates, ground, and brazed copper tubes	11c. per lb
	Brass rods, sheet brass, brass plates, bars, and strips, Munts or yellow metal sheets, sheathing, bolts, piston rods and shafting	4c. per lb
	Seamless brass tubes and tubing	8c. per lb.

Table 42.—United States Tariff—Continued

Item Number	Material	Duty
	(a) On Metals and Manufactures of—Concluded	
	Brazed brass tubes, brass angles and channels	12c. per lb.
	Bronze rods and sheets	4c. per lb.
	Bronze tubes	8c. per lb.
1539	Bullion gold or silver	Free
1634	Gold ores and sweepings	Free
1597	Iron ore including manganiferous iron ore and residuum from burnt pyrites	Free
1677	Sulphur in any form, and sulphur ore, and spent oxide of iron containing more than 25 per centum of sulphur	Free
392	Lead bearing ores and mattes—duty applied on lead contents, such duty shall not be applied to the lead contained in copper mattes unless actually recovered	1½c. per lb.
393	Lead bullion or base bullion, lead in pigs and bars, dross, reclaimed lead, scrap lead, antimonial lead, antimonial scrap lead, type metal, Babbitt, solder and all other combinations not specially provided for, duty to apply on lead contents	2¼c. per lb.
	Lead in sheets, pipe, shot, glazier's lead and lead wire	2¾c. per lb.
47	Lead, linoleate of	30% ad val.
74	Lead litharge	2½c. per lb.
302	Manganese ore or concentrates containing in excess of 30 per centum of metallic manganese	1c. per lb. on metallic manganese content.
302	Molybdenum ore or concentrates	35c. per lb. on metallic molybdenum content.
302	Tungsten ore or concentrates	45c. per lb. on metallic tungsten content.
1634	Nickel mattes and ores of nickel	Free
390	Nickel oxide	1c. per lb.
390	Nickel and nickel alloys in pigs, ingots, shot, cubes and similar forms	3c. per lb.
390	Nickel in bars, rods, sheets, strips, tubing, etc	25% ad val.
390	In addition thereto on the foregoing if cold rolled, drawn or worked	10% ad val.
1596 1644	Platinum, palladium and other metals of the platinum group	Free
394	Zinc-bearing ore of all kinds containing less than 10 per centum of zinc	Free
	Containing 10 per centum or more of zinc and less than 20 per centum	½c. per lb. on metallic zinc content.
	Containing more than 20 per centum of zinc and less than 25 per centum	1c. per lb. on metallic zinc content.
	Containing 25 per centum of zinc or over	1½c. per lb. on metallic zinc content.
395	Zinc in blocks, pigs or slabs and zinc dust	1¾c. per lb.
395	Zinc in sheets	2c. per lb.
395	Zinc scrap for re-manufacturing	1½c. per lb.
	(b) On Non-Metallic Minerals	
1619	Actinolite—crude, classified as "minerals, crude, not specially provided for"	Free
214	Actinolite—ground, classified as "earthy or mineral substances, wholly or partly manufactured, not specially provided for"	30% ad val.
1513	Arsenic—white or arsenious acid	Free
1512	Arsenic—Sulphide of	Free
379	Arsenic—Metallic	6c. per lb.
1515	Asbestos—crudes, fibres, sand	Free
1401	Asbestos—yarn	30% ad val.
69	Barytes—ore, crude	$4 per ton
69	Barytes—ore, ground	$7.50 per ton.
	Calcite—not mentioned by this name in the tariff. Chalk, crude, is free (Item 1545) and chalk, ground, is dutiable at 25% ad valorem (Item 20).	
1570	Corundum—ore	Free
1415	Corundum—ground	1c. per lb.
1619	Feldspar—crude, classified as "minerals, crude not specially provided for"	Free
214	Feldspar—ground, dutiable as "earthy or mineral substances, wholly or partly manufactured, not specially provided for"	30% ad val.
207	Fluorspar	$5.60 per ton
	Fluorspar—from Nov. 16, 1928 fluorspar containing not more than 93 per cent, calcium fluoride	$8.40 per ton
213	Graphite or plumbago—crude or refined—amorphus	10% ad val.
213	Graphite or plumbago—crude or refined—crystalline lump, chip or dust	20% ad val.
213	Graphite or plumbago—crude or refined—crystalline flake	1¾c. per lb.
236	Grindstones—finished or unfinished	$1.75 per ton
1643	Gypsum—crude	Free
205	Gypsum—ground	$1.40 per ton
75	Iron oxides—ochres, crude	¼c. per lb.
75	Iron oxides—ochres, washed or ground	½c. per lb.
75	Iron oxides—"iron-oxide pigments not specially provided for"	20% ad val.
†204	Magnesite—crude	15/16c. per lb.
†204	Magnesite—caustic calcined	15/16c. per lb.
204	Magnesite—dead burned and grain	29/40c. per lb.
50	Magnesium sulphate—(Epsom salts)	⅛c. per lb.
208	Mica—unmanufactured, valued at not above 15 cents per pound	4c. per lb.
208	Mica—unmanufactured, valued above 15 cents per pound	25% ad val.
208	Mica—cut or trimmed, and mica splittings	30% ad val.
208	Mica—ground	20% ad val.
808	Mineral waters	10c. per gal.

Table 42.—United States Tariff—Concluded

Item Number	Material	Duty
	(b) On Non-Metallic Minerals—Concluded	
1640	Phosphate—"phosphates, crude"	Free
1677	Pyrites—"sulphur ore, such as pyrites or sulphuret of iron in its natural state, and spent oxide of iron, containing more than 25% of sulphur"	Free
83	Salt—in bags, sacks, barrels, or other packages	11c. per 100 lb.
83	Salt—in bulk	7c. per 100 lb.
83	Sodium sulphate—crystallized or Glauber's salt	$1.00 per ton
1667	Sodium sulphate, crude or salt cake	Free
207	Silica—crude, not specially provided for	$4 per ton
207	Silica—for use as pigment, not specially provided for	$7.50 per ton
209	Talc—crude	¼c. per lb.
209	Talc—ground, washed, powdered, or pulverized (except toilet preparations)	25% ad val.
1675	Tripoli—crude or manufactured, not specially provided for	Free
	(c) On Structural Materials and Clay Products	
	Clay Products—	
201	Brick—bath, chrome and fire, n.s.p.f.	25% ad val.
	Magnesite brick	¾c. per lb. and 10% ad val.
1536	Brick—not specially provided for	*Free
207	China clay or Kaolin	$2.50 per ton
207	Clays or earths, unwrought or unmanufactured, including common blue clay and Gross-Almerode glass pot clay, n.s.p.f.	$1.00 per ton
207	Clays or earths, wrought or manufactured, n.s.p.f.	$2.00 per ton
210	Earthenware—common yellow, brown or gray made of natural, unwashed, and unmixed clay, plain or embossed; common salt-glazed stoneware; stoneware and earthenware crucibles; all the foregoing not ornamented, incised, or decorated in any manner	15% ad val.
210	Earthenware—common yellow, brown, or gray earthenware made of natural, unwashed and unmixed clay, plain or embossed; common salt-glazed stoneware; stoneware and earthenware crucibles; all the foregoing ornamented, incised, or decorated in any manner and manufactures wholly or in chief value of such ware, n.s.p.f.	20% ad val.
210	Earthenware—Rockingham	25% ad val.
203	Lime—n.s.p.f., including weight of container	10c. per 100 lb.
203	Lime—hydrated, including weight of container	12c. per 100 lb.
237	Slates—slate chimney pieces, mantles, slabs for tables, roofing slates, and all other manufactures of slate, n.s.p.f.	15% ad val.
	Stone—	
203	Limestone—(not suitable for use as monumental or building stone) crude, or crushed but not pulverized	5c. per 100 lb.
235	Limestone, freestone, granite, sandstone, lava and all other stone suitable for use as monumental or building stone, except marble, breccia, and onyx, n.s.p.f., hewn, dressed, or polished, or otherwise manufactured	50% ad val.
235	Unmanufactured, or not dressed, hewn or polished	15c. per cubic ft.
232	Marble, breccia and onyx, in block, rough or squared only	65c. per cubic ft.
232	Marble, breccia and onyx, sawed or dressed, over two inches in thickness	$1.00 per cubic ft.
232	Marble, breccia and onyx slabs and paving tiles, containing not less than four superficial inches, if not more than one inch in thickness	8c. per superficial foot
	If more than one inch and not more than one and one-half inches in thickness	10c. per superficial foot
	If more than one and one-half inches and not more than two inches in thickness	13c. per superficial foot
	If rubbed in whole or in part	3c. per superficial foot in addition.
	Mosaic cubes of marble, breccia, or onyx, not exceeding two cubic inches in size, if loose	One-fourth of one cent per lb. and 20% ad val.
	If attached to paper or other material	5c. per superficial foot and 35% ad val.
1675	Stone and sand: burrstone in blocks, rough or unmanufactured; quartzite; traprock; rottenstones; tripoli and sand, crude or manufactured; cliffstone; freestone; granite and sandstones; unmanufactured, and not suitable for use as monumental or building stone; all of the foregoing n.s.p.f.	Free

*Except on imports from countries which impose a duty on similar products imported from U.S. On imports of these commodities a corresponding duty is levied.

†In effect Dec. 10 1927. Previous rates 5/16 c. and ¾ c. T. D. 42429.

Table 43.—Accidents in the Mining Industry in Canada, by Provinces*, 1929

Cause of Accident	Nova Scotia		New Brunswick		Quebec		Ontario		Saskatchewan		Alberta		British Columbia		Canada	
	Fatal	Non-fatal	Fatal	Non-fatal	Fatal	Non-fatal	Fatal	Non-fatal	Fatal	Non-fatal	Fatal	Non-fatal	Fatal	Non-fatal	**Fatal**	**Non-fatal**
UNDERGROUND—																
Falls of roof or face	10	849	1	52	3	69	6	304	....	5	14	46	11	372	**45**	**1,697**
Mine cars and locomotives	6	589	....	38	....	27	....	134	....	8	8	48	7	209	**21**	**1,053**
Gas and dust explosions	....	5	....	6	....	....	....	....	....	....	....	4	....	8	....	**23**
Explosives	....	3	....	8	2	6	11	17	....	....	2	21	3	8	**18**	**63**
Electricity	1	2	....	....	1	....	....	....	....	....	1	....	....	4	**3**	**6**
Miscellaneous	4	790	1	84	4	216	23	1098	....	24	3	29	4	756	**39**	**2,997**
Total	21	2238	2	188	10	318	40	1553	....	37	28	148	25	1357	**126**	**5,839**
SURFACE—																
Haulage and cars	....	101	....	6	4	19	2	45	....	....	1	1	1	50	**8**	**222**
Machinery	1	56	....	1	1	50	3	68	....	....	....	6	....	84	**5**	**265**
Miscellaneous	2	331	....	15	....	89	10	723	....	....	2	12	....	483	**14**	**1,653**
Total	3	488	....	22	5	158	15	836	....	....	3	19	1	617	**27**	**2,140**
Grand Total	**24**	**2726**	**2**	**210**	**15**	**476**	**55**	**2389**	....	**37**	**31**	**167**	**26**	**1974**	**153**	**7,979**

*Data for Manitoba not available.

CHAPTER TWO

THE GOLD MINING INDUSTRY IN CANADA

(With tables showing the production of gold)

1. General Review.
2. Review of the Gold Mining Industry in Canada by Areas.
3. The Alluvial Gold Mining Industry.
4. The Auriferous Quartz Mining Industry.
5. The Copper-Gold-Silver Mining Industry.
6. Commodity Statistics—including tables showing production by provinces, imports, exports, and world output of gold.

1. General Review

CANADA

(a) *Definition of the Industry.*—Canada's gold mining industry is classified into three main divisions: the direct recovery of placer gold or the alluvial gold mining industry; the extraction of the metal from gold-bearing quartz ores, designated as the auriferous quartz mining industry; and the supply coming, as a by-product, through the metallurgical treatment of base metal ores and, in this classification, called the copper-gold-silver mining industry. Gold obtained in the copper-nickel, silver-lead, and other mining industries is included in the total production of the country.

(b) *Historical.*—The early history (1850-1895) of gold production in Canada is largely confined to the placer operations of the pioneer prospector in British Columbia, and it was from this source that most of the metal was derived until the discovery, in 1896, of the extremely rich gravels of the Klondike river in the Yukon Territory; between 1898 and 1905 gold to the value of more than $100,000,000 (4,838,000 fine ounces) is stated to have been obtained from the placers of the Bonanza, Eldorado, Hunker, Dominion and Sulphur Creeks. Coincident with this western activity was witnessed the Lake of the Woods (Ontario) discoveries and renewed activity on the Nova Scotia quartz veins. The past fifteen to twenty years, although seeing the decline of the alluvial industry, have given to the nation the highly productive auriferous quartz mines of the Porcupine and Kirkland lake camps. The base metal mining industries contribute a considerable amount of gold to Canada's total production. This is most highly reflected by the recent expansion in the copper-gold industry and is strikingly exemplified by the Noranda development in the province of Quebec.

(c) *Sources.*—In 1929 the auriferous quartz mines contributed 87 per cent of the total Dominion production; alluvial deposits, 2 per cent; Canadian smelters, in base bullion and blister copper, 5 per cent; and gold recovered by foreign plants in the treatment of Canadian ores, 6 per cent.

(d) *Importance of the Industry.*—Gold in 1929 held third place in the valuation of Canada's mineral output and amounts to 12·8 per cent of the total value. A continuous growth in the industry during recent years has established for the country a prominent position among the world's gold producers; the conglomerate reefs of South Africa with their consistent values and great tonnage still account for more than half of the annual total, the United States with a slowly diminishing production retains second place, while Canada follows closely in third position with a new high record production in 1929 of 1,928,308 fine ounces valued at $39,861,663. The discovery and development of our more important gold deposits have not only made large direct contributions to the wealth of the nation but have assisted materially in the colonization of our northern agricultural lands, the harnessing of important water powers, and the general development of our northern natural resources.

2. Review of the Gold Mining Industry by Areas

Nova Scotia

Gold mining in Nova Scotia dates back to the early sixties. Annual yields varying from 6,863 fine ounces to 30,348 fine ounces are recorded from 1862 to 1902, in 1904 production dropped to 10,362 ounces and remained around this figure until 1910. Since then there has been no appreciable increase in production. The total value of the provincial gold output amounts to $19,078,862 of which $55,545 was contributed during 1929.

There has been considerable discussion regarding the economic geology of the Nova Scotia deposits. Gold, usually in the free state, and often as rich concentrations of native metal, occurs in comparatively narrow quartz leads or multiple vein systems called belts. Values are often associated with arsenopyrite and in one district with antimony; at present there are about one hundred known localities where gold has been found in situ. The veins occur, in most instances, in anticlinal folds of slate or quartzite. These auriferous areas have witnessed some renewed activities during the past few years. Hydro electric power is now available throughout the greater part of the province.

Quebec

Quebec, although not a gold producer of great prominence, is known to possess several large gold bearing districts of considerable merit, some of which have been hampered in exploration or development by lack of transportation facilities. The Chibougamau area was quite active during the year; the recently discovered copper-gold deposit near Opemiska Lake appears to possess distinct economic possibilities and in the Rouyn and northwestern districts the Noranda operations were outstanding. This company's gold production from sulphide ores is now an important item in the country's precious metal output. During 1929 the smelter treated 428,221 tons of ore from which were made 51,625,478 pounds of blister copper containing 2·66 ounces of gold per ton. The Siscoe mill was completed early in the season and production was continuous throughout the year. Development of ore reserves was extensive at the Grenada Rouyn gold mine and the O'Brien Cadillac made several shipments of high grade ore. Production of gold from this province in 1929 totalled 90,798 fine ounces valued at $1,876,961.

Ontario

The production of gold in Ontario has shown a remarkable growth during the past twenty years. The rise and fall in the production figures of individual camps reflects, in many instances, the vicissitudes encountered in the underground exploration and development of complex ore shoots or intricate vein structures.

Ontario mines, during 1929, recovered 1,622,267 ounces of fine gold amounting to 84·1 per cent of the total Canadian gold production. This remarkable growth of the industry in Ontario may be appreciated in a comparison with the 1913 record of 219,801 ounces, which, in that year, formed 27·4 per cent of the national total.

The Porcupine area, with nine major operating mines, produced 932,732 ounces of fine gold in 1929 with a value of $19,281,281. The Hollinger, ranking as one of the world's largest gold mines, retained the first position as a Canadian gold producer. The McIntyre, benefiting from a intensive program of modern mine development, attained second place of importance in the list of camp producers. Production at the Dome mine was affected by the loss of its mill by fire during the month of October; the annual gold recovery, however, was sufficiently great to command a third position of importance. Other Porcupine producing mines in the order of the value of their output were the Vipond, Coniaurum, March, West Dome Lake, Ankerite, and Porcupine United. The aggregate yield of gold from the Porcupine area has now reached a value of $247,392,356.

The quartz veins or masses of the Porcupine camp are associated with quartz porphyries, schistose volcanics of Keewatin age and Temiskaming sediments. The ore bodies vary in shape the most characteristic type is the quartz lens of irregular form, the most conspicuous of which have been found at the Dome.

In the Kirkland lake district the more recently developed mines have, since their discovery in 1911, recovered 2,016,396 ounces of fine gold. This production came principally from the Lake Shore, Teck-Hughes and Wright Hargreaves mines. Other important producers are the Kirkland lake, Sylvanite and Barry-Hollinger, the last located a few miles to the south in the Boston Creek section. Most of the properties during 1929 pursued energetic development and exploration operations. Serious endeavours were continued, especially to the East, to enlarge the camp's productive area. Modern mining and milling practices reached a new high standard of perfection.

Values in the Kirkland Lake camp are believed to be genetically related to a feldspar porphyry instrusive. The gold deposition appears to follow a main fault zone through a series of Temiskaming sediments, feldspar porphyries and Keewatin rocks. The main fissure and shatter zone vein fillings are principally composed of quartz; gold values are often high across several feet of vein matter; free gold and tellurides are quite common.

The results of the widespread prospecting and exploration activity of 1928 appeared to lead to a concentration of effort in 1929. Doubtful prospects were eliminated and efforts directed to more promising properties. In the Patricia district the Howey mine continued with the development of their ore reserves and the construction of a modern mill was commenced. Prospects in the Woman and Pickle lake areas were quite active and considerable valuable information regarding their economic geology was obtained. Several of the older mining districts were investigated and in some instances unprofitable mines of the straight amalgamation period were re-examined with the supposition that modern mining and milling methods might permit of their economical operation.

The metallurgical plants of the International Nickel Company produce a considerable amount of gold in the treatment of the copper-nickel ores mined in the Sudbury district. Precious metal recoveries are made in refineries operated at Clydach, Wales, and Port Colborne, Ontario. In addition to the gold coming from the nickel bearing sulphides there is an appreciable quantity contained in the concentrates made from the complex copper-lead-zinc ores mined in the western inner section of the Sudbury basin.

Ore deposits occuring in rocks of pre-Cambrian age provide all of Ontario's gold production. There is, in the productive camps, a strong similarity in the close relationship of the deposits with acid intrusives of Algoman age. Deposition from gold-bearing solutions is believed to have focused in sheared or schisted zones subsequent to intense igneous activity which was accompanied by the faulting or fracturing of the Keewatin and Temiskaming rocks.

Prairie Provinces

Manitoba, Saskatchewan *and* Alberta.—The greater portion of the southern sections of these three provinces is underlain by a series of post Cambrian sediments, a series of rocks unlikely to contain gold bearing deposits.

The northern parts of Manitoba and Saskatchewan posess large areas of pre-Cambrian rocks. In Alberta the exposure of these older formations is much less, consisting of about 5,000 square miles. It is in comparatively recent years that anything approaching a widespread exploration of these virgin areas has been attempted. Transportation facilities have been quite limited and movement of supplies confined to the main waterways. The topography and geology resembles in general features those of the eastern archaen peneplain with possibly a higher percentage of muskeg or bog land. Aerial transportation has, in the last few years, made rapid strides in the northern sections of the Prairie Provinces. Prospectors with supplies are now able to reach the most remote locations with comparative ease.

Gold has been found over widely scattered areas in Manitoba and at locations in Saskatchewan. In the eastern or Rice-Long lakes section of Manitoba several promising gold properties have been systematically explored with encouraging results. The Central Manitoba mine is now in its third year of production and development of the San Antonio near Rice Lake is yielding very favourable results. In the northwest section of Manitoba several areas were quite active during 1929. Copper-gold deposits at Oxford lake were diamond drilled and exploratory work done on several gold-bearing claims in the Herb and Elbow Lakes districts.

The most important mining operations in the province were centered towards the Saskatchewan boundary at the Flin Flon and Sherritt Gordon mines. Both companies were very

active in exploration and in the development of ore reserves. The Hudson Bay Mining and Smelting Company carried on construction of modern metallurgical plants for the treatment of Flin Flon and custom ores. The sulphide ore deposits of the Flin Flon and Sherritt Gordon mines, although differing in some respects as to their geology and mineralization will yield essentially copper-gold-zinc ores. It is expected that both blister copper and refined zinc will be produced at the former property sometime during the coming year.

There is no record of any important gold production from Alberta. Efforts to profitably recover small amounts of gold contained in the sands and gravels of the Saskatchewan river were attempted several years ago.

British Columbia

The gold production in British Columbia from 1858 to 1892 came entirely from placer operations, the greater part of this being from the Cassiar and Cariboo districts. In 1929 the value of alluvial production amounted to $111,298, a decrease of $31,710 from the previous year, 87 per cent of this recovery coming from the Cariboo, Quesnel and Atlin mining divisions. Hydraulicing plants were erected during the year in a number of placer fields, some of which may be productive during 1930.

A decrease in lode gold production during 1929 is attributed to cessation of mining at Rossland and a lowering in grade of the Premier ores. The Portland Canal division contributed 96,676 ounces or approximately 66 per cent of the provincial total. A large proportion of the annual production comes from the treatment of complex ores in which silver, copper, lead and zinc are often important constituents. Smelters recovered 107,248 ounces of gold from this type of ore during 1929 while 17,609 fine ounces were extracted at the quartz-gold mines by cyanidation or other local treatments.

The economic geology of British Columbia gold deposits is, on the whole, considerably different to that found in the eastern camps. Intrusives and sediments of much later geological ages are often encountered and the rugged topography is in strong contrast to the weathered and glaciated pre-Cambrian surfaces of Manitoba, Ontario and Quebec.

Yukon

An alluvial gold production of 35,678 fine ounces in the Yukon during 1929 showed a slight increase over the 34,313 ounces recorded in 1928. Yukon gold production now occupies a fourth position in the list of gold recoveries reported by the different gold mining provinces and territories of the Dominion. During 1929 there was only one company operating dredges, some hydraulic operations were reported and 56 miles of ditches were in operation or under construction. It is estimated that the material handled in placer mining amounted to 4,500,000 cubic yards. Numerous individual operators and prospectors were active throughout the Territory.

The total gold production and general magnitude of gravel washing in 1929 is in sad contrast to those of the old bonanza years when during the year 1900, 1,077,553 fines ounces were recovered. The production mounted rapidly for a few years following the sensationally rich discoveries of '96 and '97; then followed a history of lessened individual recovery, depleted values and the entry of the large operators. Modern dredges and systematic hydraulicing largely accounted for an increased production from 1909 to 1913. The last two decades have portrayed a picture of clean-up extractions and declining recoveries.

(3) The Alluvial Gold Mining Industry

It is very difficult to secure complete information on alluvial mining in Canada since placer fields are mostly remote and except in a few cases are operated by small numbers of men of no fixed abode. Dredging and hydraulicing companies operating in the Yukon Territory send annual returns to the Bureau and with the aid of the *Mining Lands Branch*, Department of Interior, under whose regulations mining is carried on in this territory, more definite information is obtainable. The report of the Gold Commissioner, Dawson, Yukon Territory, regarding mining for the year ending March 31, 1930, is as follows:—

Report of the Gold Commissioner, Dawson, Yukon Territory, regarding mining

Placer Gold Mining.—The amount of placer gold mined during the year on which royalty export tax was paid was 44,197·92 ounces, an increase over the previous year of 559·09 ounces.

Yukon Consolidated Gold Corporation, Limited.—This company operated dredge Canadian No. 2 on Hydraulic Mining Lease No. 18. The dredge commenced digging on May 24, and closed down on October 1, having dredged 1,300,000 cubic yards, all of which was artificially thawed by water pumped from the Klondike River and distributed through the system by pipe lines. Three Keystone drills drilled the pits in which the pipes were inserted in order to force the water to bed rock. Water was delivered under a pressure of forty-five pounds at the points.

Dredge Canadian No. 3.—This dredge, which had been idle since 1918, was reconditioned and commenced digging on September 25. It closed down on December 1, having dredged a total of 450,000 cubic yards. It also operated on Lease No. 18.

Dredge Canadian No. 4.—This dredge commenced digging on June 6, on Lease No. 18, and closed down on November 1, having handled 1,100,000 cubic yards during the season.

Dredge New North West N. 1.—Commenced operations on Upper Dominion Creek on June 22, and closed down on November 1, a total of 600,000 cubic yards was dredged. All of the ground was artificially thawed, a thawing plant of 1,600 points being operated. The water for thawing was pumped from Dominion Creek by two electrically driven pumps and delivered at the points under a pressure of thirty pounds.

Dredge New North West No. 2.—Also operated on Dominion Creek just below the Town of Granville. It commenced operations on May 28, and closed down on November 21, having dredged 460,000 cubic yards. A thawing plant of 1,000 points thawed ground ahead of the dredge. The water flowed by gravity through ditches constructed under Water Grants Nos. 9024 and 9025.

Hydro-Electric Power Plant.—This plant, which is operated by water taken from the North Fork of the Klondike River under Water Grant No. 10, operated continously throughout the year. Power was furnished for all the dredges which operated throughout the season. Two Marion electrically driven shovels were operated digging an extension of the power canal 15·6 miles in length, which, when completed, will carry 20,000 inches of water from the South Fork of the Klondike and discharge it into the North Fork above the intake of the present ditch.

Power was also furnished to the Dawson Electric Light and Power Company for lighting the City of Dawson, and to the Dawson City Water and Power Company, for pumping and heating the water circulated through the city mains. A total of 11,565,000 k.w.h. was generated and transmitted to the various operations during the year.

Transmission lines.—One hundred and thirty miles of high tension power lines, which connected the power plant with the various sub-stations, were maintained in an efficient state of repair.

Hydraulics.—Two nozzles were operated at Crofton Gulch and two on Lovett Gulch. Water for these operations was supplied through the Twelvemile Ditch. A total of 530,000 cubic yards of gravel and bed rock was sluiced during the season.

Repairs to the ditch commenced on May 1, and were suspended on November 1. Hydraulicing commenced on May 15, and closed on September 30.

Transportation.—Four caterpillar tractors, four trucks and nine cars were in constant use during the season. Two new trucks purchased in 1929.

An average of two hundred and twenty-five men was employed during the season.

Other Placer Operations.—Many individuals and miners working in partnership were engaged in placer mining and experienced a successful season. The prospecting leases on Thistle Creek have been renewed. Considerable work was done on them last summer with a drag line scraper, and it is the intention to prosecute the work vigorously this summer. Prospecting leases have also been issued as follows:—Five miles on Selwyn River; one mile on Nansen Creek; one mile on Johnson Creek, a tributary of the McQuesten River; one mile on Upper Bonanza; one mile on Victoria Gulch, a tributary of Upper Bonanza; two miles on Gauvin Gulch, and one mile on O'Neil Gulch, which are also tributaries of Upper Bonanza, and one mile on All Gold Creek. It is hoped that some good results may follow from these operations.

The dredge which was lying idle in the Glacier District for many years was taken over by a new company, and they commenced operations last summer on Sixtymile Creek. They employed from twelve to fifteen men during the season and dredged about 100,000 cubic yards. The manager of the company operating this dredge left Dawson about a month ago to make preparations for this season's work, and they are apparently well satisfied with the results obtained.

Lode Mining, Dawson District.—Development work has been continued on the "Lone Star" group of claims on Victoria Gulch. Last summer they drove a tunnel in unbroken ground 82 feet south of the old tunnel for a distance of 205 feet.

The extension of the "Carthey" vein was crosscut 146 feet from the entrance. The vein at the point of intersection was about four and one-half feet wide. An average of six men was employed during the season. It is the intention of the company to prosecute operations during this summer.

Claims on the Fifteenmile on the Yukon River, on Little Twelvemile, on Eldorado Creek and on Gold Run are still being held, but no extensive work has been done. The conglomerate claims on Indian River are in the same position as last year, several claims being held with the hope of obtaining capital for development.

Mayo District.—The principal operator in this district is the Treadwell Yukon Company, Limited. At the end of the year this company had under option, purchase, or located in its own name, sixty-three claims, or a total area of 1,677 acres, divided into seven separate groups for mining and prospecting purposes. During the year the company acquired the "Silver King" group of nine claims with an area of 274 acres. This property is located on Galena Hill.

During the summer months the company shipped 6,909·49 tons of ore and concentrates containing 3,102,093 ounces of silver and 7,810,493 pounds of lead, which had a metal value of $1,586,756.06 for the silver, $528,360.10 for the lead, and $3,397.66 for the gold ore, a total value of $2,118,513.82. In addition, the company was instrumental in shipping for individual operators a total of 690 dry tons containing 185,503·92 ounces of silver and 952,092 pounds of lead, the smelter value of which was $95,295.13 for the silver and $62,888.03 for the lead, a total of $158,183.16. The total production of the camp was 7,599 dry tons valued at $2,276,696.98, besides 135·24 dry tons of ore containing 216 ounces silver per ton, and 64% lead, were shipped to the Selby Smelter for Anderson and Pickering. It is assumed that between 10,000 and 11,000 tons of ore will be shipped this year.

New Construction.—At the main camp of the Treadwell Yukon Company, Limited, a new 180 H.P. Diesel Engine was installed to drive the compressor. At the "Mastiff" group a 1,500-foot transmission line was built to supply electrical energy for that operation.

At the "Elsa" group a new bunk house, a mess house with a capacity for taking care of thirty men, were erected, as well as blacksmith shop, compressor and change room. A 110 H.P. Diesel Engine was installed to drive a new 500 cubic foot air compressor.

At the "Silver King" group a new bunk house, two head frames, two ore bins, a large compressor, a hoist house and a blacksmith shop were built. This mine is equipped with a 165 H.P. Diesel Engine driving a 600 cubic foot compressor and a 75 K.W. generator.

Sixteen miles of road were also constructed from the Mayo-Keno Road junction at Williams Creek, to facilitate handling supplies to the "Mastiff", "Elsa" and "Silver King" groups.

In the Town of Mayo the company installed a 110 H.P. Diesel Engine to drive a 60 K.W. generator for lighting the town and furnishing power.

Outside of the operations of this company, considerable prospecting and development work has been done by individuals with promising results.

In the Beaver River District prospecting was carried on by the Consolidated Mining and Smelting Company on properties which they had under option. They employed eight men during the months of July and August, carrying out preliminary prospecting with a diamond drill. Several holes were drilled, some to a depth of 700 feet, but they have since released their options and have moved the machinery about thirty-five miles further north on Silver Hill to the Carpenter and McLean group of claims, where drilling operations will be carried on during the coming summer.

The outlook for the future of this camp is promising, notwithstanding the drop in the price of silver and the consequent curtailment of mining operations by the Treadwell Yukon Company, Limited. There will be more activity by individual prospectors and claim owners on the different hills. The closing down of low grade silver and lead mines on the outside should eventually turn the attention of capital to the high grade deposits contained in this territory, for even at the present low price of silver and the high cost of transportation to the smelters, the ore being shipped out this season will net a handsome profit to the shippers.

Table 44.—Principal Statistics of the Alluvial Gold Mining Industry in Canada, 1928 and 1929

Item	British Columbia		Yukon		Canada	
	1928	1929	1928	1929	1928	1929
Number of firms and individual operators*	43	54	39	14	82	68
Time in operation—months	6-8	6-8	6-8	6-8	6-8	6-8
Capital employed $	1,804,645	3,201,699	8,579,930	4,036,151	10,384,575	7,237,850
Number of employees	200	244	142	244	342	488
Wages paid $	168,212	214,040	370,058	372,153	538,270	586,193
Fuel and electricity used $	7,534	2,969	49,644	.....	57,178	2,969
Electricity generated—						
(a) for own use k.w.h.	.....	.....	3,080,890	9,040,492	3,080,890	9,040,492
(b) for sale k.w.h.	.....	.....	6,744,140	2,365,008	6,744,140	2,365,008
Value of electricity sold $	.....	.....	67,741	23,650	67,741	23,650
Crude gold recovered crude oz.	8,424	6,447	42,645	44,598	51,069	51,045
Value of gold and silver $	140,189	109,599	709,727	724,708	849,916	834,307
Platinum recovered crude oz.	49	28	.....	.....	49	28
Value of platinum recovered $	2,819	1,699	.....	.....	2,819	1,699
Quantity of material handled cubic yd.	1,188,667	1,336,390	5,097,182	4,500,000	6,285,849	5,836,390
Length of ditches miles	81	93	90	56	171	149
Total value of alluvial gold production $	143,008	111,298	709,727	724,708	852,735	836,006

*In addition to the number shown in the table there were many individual operators from whom no returns were available.

4. The Auriferous Quartz Mining Industry

This industry includes the mining and milling of ores in which gold is the predominating metal and from which the values are usually recovered by various systems of cyanidation or amalgamation. Refractory ores containing lead, copper, arsenic, antimony and sometimes other metals are usually concentrated by selective flotation or other methods and the gold-bearing concentrates shipped to smelters for further treatment. Gold occurs in Nova Scotia in both free milling ores and in association with arsenic and antimony. In northwestern Quebec two mines operate on free milling quartz ores, one amalgamating and cyaniding, the other cobbing and shipping high grade ore. The majority of the larger gold mines in Ontario have adopted straight cyanidation, some of the smaller producers recover only by amalgamation and in a few instances a combination of the two methods is utilized. There is, in the ores from the large Ontario mines, an average proportion of 7 ounces of gold to 1 of silver. A greater variety of gold ore is mined in British Columbia than in any of the other provinces. This is emphasized in the different metallurgical processes involved in the provincial gold recoveries. As a general rule, each ore with its own type of mineralization, requires its own peculiar extraction methods. The rich gold-silver-lead ores of the Premier mine, are concentrated and the concentrates shipped to other plants for smelting.

Table 45.—Capital Employed by Provinces in the Auriferous Quartz Mining Industry in Canada, 1928 and 1929

—	*Nova Scotia		Ontario		British Columbia		Canada	
	No.	$	No.	$	No.	$	No.	$
1928								
Producing	5	4,921,235	20	82,359,828	9	12,132,661	34	99,413,724
Operating but not producing	10	4,308,057	48	40,732,215	8	3,239,714	66	48,279,986
Total	**15**	**9,229,292**	**68**	**123,092,043**	**17**	**15,372,375**	**100**	**147,693,710**
1929								
Producing	6	7,932,009	21	85,547,367	11	14,440,638	38	107,920,014
Operating but not producing	10	6,588,356	31	19,303,330	6	1,354,405	47	27,246,091
Total	**16**	**14,520,365**	**52**	**104,850,697**	**17**	**15,795,043**	**85**	**135,166,105**

*Includes data for 1 producing mine and 1 non-producing in Manitoba in 1928, also for 1 producing and 4 non-producing in Quebec in 1928, and for 1 producing and 2 non-producing in Manitoba in 1929, also for 2 producing and 4 non-producing in Quebec in 1929.

Table 46.—Ores Mined and Milled, Crude Bullion Produced and Shipped from the Auriferous Quartz Mines in Canada, by Provinces, 1928 and 1929

—	*Nova Scotia	Ontario	British Columbia	Canada
1928				
Number of producing mines	5	20	9	34
Ore mined ... tons	55,079	4,212,789	333,760	4,601,628
Ore milled ... tons	55,124	4,218,680	209,249	4,483,053
Tailings re-treated ... tons	.....	.....	43,536	43,536
Bullion recovered by amalgamation ... crude oz.	1,586	143,509	.....	145,095
Bullion recovered by cyanidation ... crude oz.	53,734	1,825,525	26,601	1,905,860
Bullion shipped ... crude oz.	55,830	1,967,217	26,601	2,049,648
Content of bullion shipped—Gold ... fine oz.	21,566	1,569,614	16,157	1,607,337
Silver ... fine oz.	1,881	241,824	1,536	245,241
Value ... $	443,463	32,586,436	334,643	33,364,542
Exchange premium ... $	.....	2,811	.....	2,811
Net value of ores, slags and residues sold ... $	.....	44,139	3,243,838	3,287,977
Total net receipts ... $	**443,463**	**32,633,386**	**3,578,481**	**36,655,330**
1929				
Number of producing mines	6	21	11	38
Ore mined ... tons	88,057	3,952,027	314,660	4,354,744
Ore milled ... tons	91,404	3,952,535	209,055	4,252,994
Tailings re-treated ... tons	.....	7,290	41,417	48,707
Bullion recovered by amalgamation ... crude oz.	17,633	144,294	295	162,222
Bullion recovered by cyanidation ... crude oz.	66,606	1,802,155	24,999	1,893,760
Bullion shipped ... crude oz.	85,283	1,977,103	25,294	2,087,680
Contents of bullion shipped—Gold ... fine oz.	42,779	1,609,544	17,609	1,669,932
Silver ... fine oz.	3,921	256,256	1,363	261,540
Value ... $	862,660	33,406,105	325,342	34,594,107
Exchange premium ... $	767	157,464	3	158,234
Net value of ores, slags and residues sold ... $	8,796	14,076	2,500,773	2,523,645
Total net receipts ... $	**872,223**	**33,577,645**	**2,826,118**	**37,275,986**

*Includes data for 1 mine in Manitoba, and for 1 in Quebec in 1928, also for 1 in Manitoba and 2 in Quebec in 1929.

Table 47.—Ores, Concentrates and Slags Shipped from the Auriferous Quartz Mines in Canada, 1928 and 1929

Item	*Ontario mines shipping		†British Columbia mines shipping		Canada
	To Canadian smelters	To Foreign smelters	To Canadian smelters	To Foreign smelters	
1928					
Number of mines	2	3	7	2	14
Tons of ore, etc. shipped	2	197	21,003	111,748	132,950
Metal content—					
Gold ... oz.	16	1,582	13,748	119,637	134,983
Silver ... oz.	630	5,771	313,916	2,182,405	2,502,722
Copper ... lb.	586	71,839	28	323	72,776
Lead ... lb.	.....	.....	635	46	681
Zinc ... lb.	.....	.....	.....	.....	.....
Arsenic ... lb.	.....	.....	.....	1,318,000	1,318,000
Net value ... $	630	43,509	337,929	2,905,909	3,287,977
1929					
Number of mines	2	3	6	4	13
Tons of ore, etc., shipped	269	44	27,278	93,203	120,794
Metal content—					
Gold ... oz.	329	714	14,327	86,224	101,594
Silver ... oz.	766	218	389,450	2,035,899	2,426,333
Copper ... lb.	9,605	206	.....	.....	9,811
Lead ... lb.	.....	.....	2,945	160,000	162,945
Zinc ... lb.	.....	.....	.....	.....	.....
Arsenic ... lb.	.....	.....	.....	1,487,175	1,487,175
Net value ... $	8,198	14,674	341,265	2,159,508	2,523,645

*Includes data for 1 mine in Quebec, 1929.
†2 Mines in British Columbia shipped to both Canadian and Foreign smelters.

Table 48.—Employees, Salaries and Wages in the Auriferous Quartz Mining Industry in Canada by Provinces, 1928 and 1929

Province	1928						1929					
	Number of employees					Salaries and wages	Number of employees					Salaries and wages
	On salary	Wage-earners			Total employees		On salary	Wage-earners			Total employees	
		Surface	Underground	Mill				Surface	Underground	Mill		
						$						$
Nova Scotia	9	42	41	4	96	75,172	11	23	27	5	66	48,321
Quebec	32	154	7	.....	193	342,922	37	101	75	7	220	340,185
Ontario	492	2,098	4,714	630	7,934	12,714,888	386	1,805	4,708	570	7,469	12,333,389
Manitoba	10	48	87	9	154	307,456	14	49	98	13	174	376,721
British Columbia	65	255	304	65	689	1,175,552	76	240	315	100	731	1,160,117
Canada	**608**	**2,597**	**5,153**	**798**	**9,066**	**14,615,990**	**524**	**2,218**	**5,223**	**695**	**8,660**	**14,258,733**

Table 49.—Wage-Earners in the Auriferous Quartz Mining Industry in Canada by Months, 1928 and 1929

Month	1928				1929			
	Mine		Mill	Total	Mine		Mill	Total
	Surface	Underground			Surface	Underground		
January	2,289	4,717	685	7,691	2,086	5,001	606	7,693
February	2,384	4,777	679	7,840	2,102	5,026	616	7,744
March	2,475	4,855	690	8,020	2,087	5,053	636	7,776
April	2,447	4,845	709	8,001	2,067	5,097	655	7,819
May	2,579	4,906	697	8,182	2,079	5,193	663	7,935
June	2,547	5,034	705	8,286	2,157	5,046	656	7,859
July	2,437	5,102	684	8,223	2,196	5,062	672	7,930
August	2,436	5,052	665	8,153	2,127	5,180	680	7,987
September	2,458	5,072	669	8,199	2,118	5,165	681	7,964
October	2,493	5,209	672	8,374	2,176	5,228	698	8,102
November	2,361	5,156	666	8,183	1,996	5,081	682	7,759
December	2,144	4,882	617	7,643	1,883	4,845	610	7,338

5. The Copper-Gold-Silver Mining Industry

Many of the ores in which copper values predominate are often mineral combinations or intergrowths of the metal bearing sulphides, pyrite, pyrrhotite and chalcopyrite with zinc blende a common additional component. These sulphide ores often contain important gold, silver and other precious metal values which are recovered as by-products in the production of refined copper from ores mined in the copper-gold-silver mining industry.

The mining and smelting of these ores has been a very important industry in British Columbia for many years. Early in 1929 the Bonanza mine in the Anyox section was brought into production by the Granby Company. This company also operated steadily at their smelter and Hidden Creek mine and in addition shipped Copper Mountain concentrates to Trail and Tacoma. The Britannia Company at Howe Sound reached a new high record production in mine tonnage and copper and silver produced. In the Quatsino Sound section the Coast Copper Company carried on a large development and construction programme. The Flin Flon and Sherritt Gordon properties in Manitoba were intensely active in the development of their sulphide ore deposits and preparations were commenced for the construction of metallurgical plants. Smaller operators in Ontario made a few shipments of copper ore from mines still in the prospect stage. The Waite-Montgomery and Horne mines both increased their shipments of copper-gold ores to the Noranda smelter. These increased tonnages accounted for a new high provincial output in copper and gold. This production together with the metal contained in the concentrates shipped by the Consolidated Copper and Sulphur Company from the Eustis mine consitute Quebec's important contribution to the Canadian copper and gold productions.

Because of interplant relations, companies which mine and smelt their own ore sometimes have difficulty in making a separation of the capital employed at the mine and smelter. The value placed on their own ore at the mine may be nominal and any profit accruing from the operations would appear to be credited to the smelter. For that reason the net value placed on shipments to the smelter may not be the same as the value computed from the metal content as determined by settlement assay.

Table 50.—Capital Employed by Provinces in the Copper-Gold-Silver Mining Industry in Canada, 1928 and 1929

—	Quebec		Ontario		Manitoba		British Columbia		Canada	
	No.	$	No.	$	No.	$	No.	$	No.	$
1928										
Producing	3	.....	1	.....	....	.....	15	.....	19	27,096,837
Operating but not producing	126	.....	4	.....	7	.....	18	.....	155	22,907,503
Total	**129**	**18,705,947**	**5**	**4,837,587**	**7**	**2,323,507**	**33**	**24,137,299**	**174**	**50,004,340**
1929										
Producing	6	.....	7	.....	....	.....	13	.....	26	20,552,263
Operating but not producing	95	.....	3	.....	3	.....	25	.....	126	31,994,434
Total	**101**	**14,288,825**	**10**	**7,649,632**	**3**	**6,083,677**	**38**	**24,524,563**	**152**	**52,546,697**

Table 51.—Ore Mined and Milled in the Copper-Gold-Silver Mining Industry, in Canada, 1928 and 1929

—	Quebec	British Columbia	Canada
1928	Tons	Tons	Tons
Ore mined	* 290,134	3,972,688	4,262,822
Ore milled	50,494	3,722,662	3,773,156
Copper concentrates produced	2,085	223,801	225,886
Pyrite concentrates produced	1,496	63,983	65,479
1929			
Ore mined	* 520,652	4,614,172	5,134,824
Ore milled	102,194	4,410,612	4,512,806
Copper concentrates produced	20,546	242,395	262,941
Pyrite concentrates produced	20,186	56,395	76,581

* Contains small tonnage of ore mined in Ontario.

Table 52.—Shipments from Copper-Gold-Silver Mines of Canada, 1928 and 1929

Destination	Quantity	Net value	Content as determined by settlement assay			
			Gold	Silver	Copper	Sulphur
1928	Tons	$	Fine oz.	Fine oz.	Pounds	Tons
12 mines shipped to Canadian smelters—						
†Ores	480,768	4,341,241	61,412	272,195	44,211,488	.....
Copper concentrates	104,181	4,397,183	5,717	271,123	40,784,503	.....
8 mines shipped to Foreign smelters—						
*Ores	3,127	47,564	248	1,243	294,654	834
Copper concentrates	125,457	6,235,077	17,434	264,981	51,640,970	.....
Pyrite concentrates	65,479	260,454	.....	.....	.....	32,782
Total	**779,012**	**15,281,519**	**84,811**	**809,542**	**136,931,615**	**33,616**
1929						
18 mines shipped to Canadian smelters—						
Ores	570,791	6,709,550	67,008	432,951	57,063,264	.....
Copper concentrates	117,744	4,275,044	9,914	227,113	35,814,481	.....
8 mines shipped to Foreign smelters—						
Ores	3,352	57,913	192	5,876	333,719	.....
Copper concentrates	145,197	10,639,950	20,054	380,834	69,554,222	.....
Pyrite concentrates	76,581	177,450	.....	.....	.....	38,203
Total	**913,665**	**21,859,907**	**97,168**	**1,046,774**	**162,765,686**	**38,203**

†Contained also 674,000 pounds of zinc.

*Contained also 1,730 pounds of cobalt, and 16,997 pounds of arsenic.

Table 53.—Employees, Salaries and Wages in the Copper-Gold-Silver Mining Industry in Canada, 1928 and 1929

—	1928			1929		
	Number of employees		Salaries and wages	Number of employees		Salaries and wages
	Male	Female	$	Male	Female	$
SALARIED EMPLOYEES—						
Total	424	37	844,646	401	29	900,605
WAGE-EARNERS—						
Surface	2,471	25	5,919,663	2,536	.....	7,598,150
Underground	1,820	.....		2,277	.....	
Total	4,291	25	5,919,663	4,813	.....	7,598,150
Total	**4,715**	**62**	**6,764,309**	**5,214**	**29**	**8,498,755**

Table 54.—Wage-Earners in the Copper-Gold-Silver Mining Industry in Canada by Months, 1928 and 1929

Month	1928				1929			
	Mine		Mill	Total	Mine		Mill	Total
	Surface	Underground			Surface	Underground		
January	1,288	1,650	297	3,235	1,528	2,023	449	4,000
February	1,390	1,643	299	3,332	1,597	2,087	454	4,138
March	1,536	1,534	297	3,367	1,624	2,026	425	4,075
April	1,640	1,573	292	3,505	1,588	2,058	445	4,091
May	1,707	1,698	303	3,708	1,804	2,151	452	4,407
June	1,922	1,712	316	3,950	1,863	2,185	486	4,534
July	1,969	1,648	334	3,951	1,883	2,198	477	4,558
August	1,967	1,681	363	4,011	1,900	2,273	474	4,647
September	1,856	1,791	369	4,016	1,994	2,319	484	4,797
October	1,846	1,855	371	4,072	1,828	2,344	471	4,643
November	1,599	1,902	348	3,849	1,750	2,308	482	4,540
December	1,519	1,932	335	3,786	1,482	2,132	450	4,064

Table 55.—Production of Gold in Canada by Provinces and by Sources, 1928 and 1929

Province	1928		1929	
	Fine ounces	Value	Fine ounces	Value
		$		$
NOVA SCOTIA—				
In gold bullion and in concentrates exported	1,290	26,667	2,687	55,545
QUEBEC—				
In blister copper and in ores exported	60,006	1,240,434	90,798	1,876,961
ONTARIO—				
Porcupine area—In gold bullion	978,172	20,220,609	932,709	19,280,805
In slags exported	1,244	25,716	23	475
Kirkland lake area—In gold bullion	591,466	12,226,687	678,745	14,030,904
In slags exported	331	6,842	759	15,690
Sudbury area—In matte and blister copper exported	3,856	79,587	7,802	161,282
Miscellaneous	3,371	69,685	2,229	46,078
Total	1,578,434	32,629,126	1,622,267	33,535,234
MANITOBA—				
In gold bullion	19,813	409,571	22,455	464,186
ALBERTA	68	1,406	5	103
BRITISH COLUMBIA—				
In alluvial gold	6,739	139,307	5,158	106,626
In gold bullion	16,157	333,995	17,609	364,010
In blister copper	31,057	642,005	18,405	380,465
In base bullion and in ores exported	142,664	2,949,127	113,032	2,336,579
Total	196,617	4,064,434	154,204	3,187,680
YUKON—				
In alluvial gold	34,116	705,240	35,678	737,530
In ores exported	248	5,127	214	4,424
Total	34,364	710,367	35,892	741,954
Total Canada	**1,890,592**	**39,082,005**	**1,928,368**	**39,861,663**

Table 56.—Production of Gold in Canada, 1858-1929

Year	Fine ounces*	Value	Year	Fine ounces*	Value	Year	Fine ounces*	Value
		$			$			$
1858	34,104	705,000	1882	60,288	1,246,208	1906	556,415	11,502,120
1859	78,129	1,615,072	1883	53,853	1,113,246	1907	405,517	8,382,780
1860	107,806	2,228,543	1884	51,202	1,058,439	1908	476,112	9,842,105
1861	128,973	2,666,118	1885	55,575	1,148,829	1909	453,865	9,382,730
1862	135,391	2,798,774	1886	70,782	1,463,196	1910	493,707	10,205,835
1863	202,498	4,186,011	1887	57,460	1,187,804	1911	473,159	9,781,077
1864	199,605	4,126,199	1888	53,145	1,098,610	1912	611,885	12,648,794
1865	192,898	3,987,562	1889	62,653	1,295,159	1913	802,973	16,598,923
1866	152,555	3,153,597	1890	55,620	1,149,776	1914	773,178	15,983,007
1867	145,775	3,013,431	1891	45,018	930,614	1915	918,056	18,977,901
1868	134,160	2,773,527	1892	43,905	907,601	1916	930,492	19,234,976
1869	102,720	2,123,405	1893	47,243	976,603	1917	738,831	15,272,992
1870	83,415	1,724,348	1894	54,600	1,128,688	1918	699,681	14,463,689
1871	105,187	2,174,412	1895	100,798	2,083,674	1919	766,704	15,850,423
1872	90,283	1,866,321	1896	133,262	2,754,774	1920	765,007	15,814,098
1873	74,346	1,536,871	1897	291,557	6,027,016	1921	926,329	19,148,920
1874	97,856	2,022,862	1898	666,386	13,775,420	1922	1,263,364	26,116,050
1875	130,300	2,693,533	1899	1,028,529	21,261,584	1923	1,233,341	25,495,421
1876	97,729	2,020,233	1900	1,350,057	27,908,153	1924	1,525,382	31,532,443
1877	94,304	1,949,444	1901	1,167,216	24,128,503	1925	1,735,735	35,880,826
1878	74,420	1,538,394	1902	1,032,161	21,336,667	1926	1,754,228	36,263,110
1879	76,547	1,582,258	1903	911,559	18,843,590	1927	1,852,785	38,300,464
1880	63,121	1,304,824	1904	796,374	16,462,517	1928	1,890,592	39,082,005
1881	63,524	1,313,153	1905	684,951	14,159,195	1929	1,928,308	39,861,663
						Total	35,515,555	734,171,770

*Calculated from the value $1=0·048375 ounces.

Refined Gold.—Two refineries produced fine gold in Canada in 1929, namely the Royal Mint, Ottawa, and the Consolidated Mining and Smelting Company of Canada, Limited, at Tadanac, near Trail, B.C. In 1929, the latter company produced 14,643 fine ounces. This gold was recovered principally from the gold in copper ores, but some was also recovered from silver-lead and dry ores. Small quantities of imported ores were also treated by this company.

Gold refined at the Royal Mint at Ottawa from the gold produced in Nova Scotia, Quebec Ontario, Manitoba, Alberta and British Columbia and from the alluvial gold obtained in the Yukon, amounted to 438,351 fine ounces, including a small amount recovered from scrap and crude gold from various sources. The total production in Canada of refined gold during 1929 was, therefore, 452,994 fine ounces.

Table 57.—Refined Gold Produced at Trail, B.C., 1920-1929*

(For years 1904 to 1919 see 1928 report on the Mineral Production of Canada)

Year	Fine ounces	Year	Fine ounces
1920	42,636	1925	18,441
1921	56,297	1926	49,607
1922	18,940	1927	29,334
1923	11,113	1928	22,751
1924	23,412	1929	14,643

*Includes some gold derived from imported ores and from occasional shipments from Ontario, Manitoba, Alberta, and the Yukon.

Table 58.—Receipts at the Royal Mint, Ottawa, Ont., by Sources, 1928 and 1929

Source	1928			1929		
	Gross weight	Precious metal content		Gross weight	Precious metal content	
		Fine gold	Fine silver		Fine gold	Fine silver
	Oz.	Oz.	Oz.	Oz.	Oz.	Oz.
Nova Scotia	1,595·81	1,289·86	77·33	2,927·88	2,686·77	131·67
New Brunswick	.....	.....	.....	.....	.....	.....
Quebec	509·70	463·52	40·74	15,383·37	13,326·25	842·65
Ontario	1,537,294·54	1,217,622·04	199,470·15	412,057·63	328,556·13	54,067·83
Manitoba	44,350·96	15,037·18	1,272·48	68,923·47	25,309·12	2,948·32
Saskatchewan	.....	.....	.....	.....	.....	.....
Alberta	.....	.....	.....	5·68	5·23	0·37
British Columbia	3·33	20·06	71·08	39·87	24·13	12·14
Dominion of Canada Assay Office, Vancouver	92,051·40	76,131·20	11,914·42	67,023·52	54,060·96	7,839·23
Yukon	.....	.....	.....	37·05	32·27	3·72
Jewellery and scrap, various sources	33,673·19	14,528·92	4,729·74	35,130·59	14,350·36	7,569·50
Foreign	25·20	16·92	6·99	.....	.....	.....
Total	**1,709,494·13**	**1,325,112·70**	**217,582·93**	**601,529·06**	**438,351·22**	**73,415·43**

Table 59.—Crude Bullion Received at Dominion Government Assay Office, Vancouver, B.C., 1920-1929

(For years 1908 to 1919 see 1928 report on the Mineral Production of Canada)

Year	Weight before melting	Weight after melting	Net value	Year	Weight before melting	Weight after melting	Net value
	Ounces	Ounces	$		Ounces	Ounces	$
1920	150,869·17	147,718·25	2,499,174·41	1925	140,691·78	123,202·39	2,065,217·16
1921	163,070·56	160,803·48	2,834,499·61	1926	162,606·56	145,279·61	2,524,337·58
1922	129,891·63	125,758·41	2,105,989·64	1927	108,080·89	102,192·93	1,750,599·35
1923	129,043·63	124,546·48	2,051,369·65	1928	107,617·27	98,392·98	1,673,926·65
1924	114,041·96	107,569·15	1,850,373·74	1929	69,985·84	61,249·57	1,032,128·51

Table 60.—Quantity of Gold produced in Canada, by Provinces, 1919-1929

(For the years 1862 to 1918, see Mineral Production of Canada, 1928)

Year	Nova Scotia	Quebec	Ontario	Manitoba	Alberta	British Columbia	Yukon
	Fine oz.	Fine oz.	Fine oz.	Fine oz.	Fine oz.	Fine oz.	Fine oz.
1919	850	1,470	505,739	724	24	167,252	90,705
1920	690	955	564,995	781	.....	124,808	72,778
1921	439	635	708,213	207	49	150,792	65,994
1922	1,042	.....	1,000,340	156	.....	207,370	54,456
1923	655	667	971,704	31	.....	200,140	60,144
1924	1,047	883	1,241,728	1,180	.....	245,719	34,825
1925	1,626	1,602	1,461,039	4,424	.....	219,227	47,847
1926	1,678	3,680	1,497,215	188	.....	225,866	25,601
1927	3,151	8,331	1,627,050	182	42	183,094	30,935
1928	1,290	60,006	1,578,434	19,813	68	196,617	34,364
1929	2,087	90,798	1,622,267	22,455	5	154,204	35,892

Table 61.—Value of Gold Produced in Canada, by Provinces, 1919-1929

(For the years 1862 to 1918 see Mineral Production of Canada, 1928)

Year	Nova Scotia	Quebec	Ontario	Manitoba	Alberta	British Columbia	Yukon
	$	$	$	$	$	$	$
1919	17,571	30,388	10,454,553	14,966	500	3,457,406	1,875,039
1920	14,263	19,742	11,679,483	16,145	.....	2,580,010	1,504,455
1921	9,075	13,127	14,640,062	4,279	1,013	3,117,147	1,364,217
1922	21,540	.....	20,678,802	3,225	.....	4,286,718	1,125,705
1923	13,540	13,788	20,086,904	641	.....	4,137,261	1,243,287
1924	21,643	18,253	25,668,795	24,393	.....	5,079,462	719,897
1925	33,612	33,116	30,202,357	91,452	.....	4,531,824	988,465
1926	34,687	76,072	30,950,180	3,886	.....	4,669,065	529,220
1927	65,137	172,217	33,634,108	3,762	868	3,784,889	639,483
1928	26,667	1,240,434	32,629,126	409,571	1,406	4,064,434	719,367
1929	55,545	1,876,961	33,535,234	464,186	103	3,187,680	741,954

Table 62.—Production of Gold. in British Columbia by Districts, 1928 and 1929

(From *Annual Report of the Minister of Mines for British Columbia*)

District and division	1928				1929			
	Gold alluvial*		Gold lode		Gold alluvial*		Gold lode	
	Ounces	Value	Ounces	Value	Ounces	Value	Ounces	Value
		$		$		$		$
Northwestern District (No. 1)—								
Atlin	3,174	53,958	193	3,990	2,408	40,936		
Stikine	29	493			38	646		
Liard	334	5,678			340	5,780		
Nass River			5,100	105,426			4,671	96,558
Portland Canal			130,304	2,693,618			96,676	1,998,467
Skeena	30	510	139	2,874	18	306	69	1,426
Queen Charlotte					9	153		
Bella Coola								
Northeastern District (No. 2)—								
Cariboo	2,287	38,879			2,495	42,415		
Quesnel	1,649	28,033			1,201	20,417		
Omineca	235	3,995	477	9,860	120	2,040	226	4,672
Peace River	200	3,400			120	2,040		
Central District (No. 3)—								
Nicola			1	21			794	16,413
Vernon			2	41				
Yale	20	340			20	340	1	21
Ashcroft								
Kamloops	15	255	157	3,246			128	2,646
Lillooet			7,730	159,793			5,001	104,620
Clinton	186	3,162			109	1,853		
Southern District (No. 4)—								
Grand Forks								
Greenwood			134	2,770			141	2,915
Osoyoos			11,843	244,816			14,217	293,891
Similkameen	242	4,114	5,265	108,837	75	1,275	5,924	122,460
Eastern District (No. 5)—								
Fort Steele	23	391	731	15,111	27	459	227	4,692
Windermere			3	62			2	41
Golden					3	51		
Ainsworth			148	3,059			96	1,984
Slocan			383	7,917			156	3,225
Slocan City			41	848				
Nelson			2,712	56,062			2,465	50,956
Arrow Lake								
Trail Creek			7,424	153,467			164	3,391
Revelstoke			1	21				
Trout Lake			7	145				
Lardeau			15	310			2	41
Western District (No. 6)—								
Nanaimo							25	517
Alberni							4	83
Clayoquot								
Quatsino								
Victoria								
New Westminster								
Vancouver			15,277	315,803			14,290	295,400
Total	**8,424**	**143,208**	**188,087**	**3,888,097**	**6,983**	**118,711**	**145,339**	**3,004,419**

*Alluvial gold is valued at $17 an ounce, which is believed to be a fair average for the whole province.

Table 63.—Receipts from the Yukon, at the Dominion of Canada Assay Office, Vancouver, B.C., 1920-1929

(For years 1908 to 1919 see 1928 report on the Mineral Production of Canada)

Year	Weight before melting	Net value	Average value	Year	Weight before melting	Net value	Average value
	Ounces	$	$		Ounces	$	$
1920	74,456·01	1,206,579	16·21	1925	61,096·43	977,624	16·00
1921	82,219·92	1,340,225	16·30	1926	32,686·16	537,822	16·46
1922	69,161·19	1,126,702	16·29	1927	39,436·44	649,402	16·47
1923	73,360·82	1,201,133	16·37	1928	42,993·43	693,765	16·13
1924	44,365·96	717,156	16·17	1929	7,970·97	120,826	15·16

Table 64.—Production of Alluvial Gold in the Yukon by Months, 1927-1929

(Gross weight of dust, nuggets, and bullion in ounces)

Month	1927	1928	1929
January	550·09	532·90	1,346·69
February	4·00	183·44	394·21
March	1,112·59	359·21	334·17
April	.....	465·49	607·02
May	973·34	686·79	567·84
June	5,480·34	5,189·72	5,898·27
July	4,335·22	5,692·05	5,013·00
August	8,695·88	6,589·03	6,633·90
September	6,604·03	10,816·02	8,074·13
October	6,584·82	5,383·91	8,063·48
November	2,116·05	4,023·29	5,526·79
December	2,016·09	2,693·46	2,138·50
Total	**38,472·45**	**42,645·37**	**44,598·00**

From 1898 to March 31, 1930, royalties to the extent of $4,960,403 were collected on the gold production of the Yukon. The yearly amounts collected, as well as the annual production of gold as ascertained by the *Department of the Interior*, are shown below. The difference between these figures and those shown in the table of annual production, which are based on mint receipts of Yukon gold is probably due to three factors: (1) the fixing of the value of the gold for royalty purposes at $15 per ounce, (2) the probability that, in the earlier years of royalty collection, considerable quantities of gold dust left the camps unrecorded and escaped royalty payments, and (3) the fact that in the last few years there has been a small production from lode mines.

Table 65.—Gold Production in the Yukon and the Royalty Collected, 1921-1930

(Supplied by the Mining Lands Branch of the Department of the Interior.)

(For years 1898 to 1920 see 1928 report on the Mineral production of Canada)

Fiscal year	Total gold production	Total exemption	Royalty collected on	Royalty paid
	$	$	$	$
Ending March, 1921	1,246,486	.....	1,246,486	31,273·76
Ending March, 1922	1,230,987	.....	1,230,987	30,774·68
Ending March, 1923	1,032,762	.....	1,032,762	25,819·04
Ending March, 1924	1,136,368	.....	1,136,368	28,409·23
Ending March, 1925	625,459	.....	625,459	15,636·48
Ending March, 1926.... Since 1902, the Dominion Government has..	879,819	.....	879,819	21,995·50
Ending March, 1927....collected a royalty of 2½ per cent on all gold..	497,504	.....	497,504	12,437·64
Ending March, 1928.... produced; the Government for royalty pur-..	568,221	.....	568,221	14,205·55
Ending March, 1929....poses, places a nominal value of $15 on each..	654,672	.....	654,672	16,366·79
Ending March, 1930....crude ounce recovered.	657,537	.....	657,537	16,438·42

Imports and Exports

Table 66.—Imports into Canada and Exports of Gold, 1927-1929

—	1927	1928	1929
Imports—	$	$	$
Coin and bullion—			
Coins, British, Canadian and foreign gold coins	30,510,818	27,654,313	2,856,947
Gold bullion, in bars, blocks, ingots, drops, sheets or plates, unmanufactured	745,820	925,612	889,541
Total	**31,256,638**	**28,579,925**	**3,746,488**
Gold, other—			
Bullion or fringe gold	31,076	47,537	37,401
Manufactures of gold and silver—			
Leaf	98,452	127,085	124,296
Sweepings	240	168	564
Manufactures, n.o.p.	85,477	58,275	78,939
Electroplated ware	1,013,799	1,282,513	1,410,202

IMPORTS AND EXPORTS—Concluded

Table 66.—Imports into Canada and Exports of Gold, 1927-1929

—	1927	1928	1929
IMPORTS—	$	$	$
Gold, other—			
Medals of gold, silver or copper, and other metallic articles, actually bestowed as trophies or prizes, and received and accepted as honorary distinctions, and cups or other metallic prizes won in bona fide competitions	18,365	17,143	24,016
Total	**1,247,409**	**1,532,721**	**1,675,418**
EXPORTS—			
Coin and bullion—			
Gold coin—			
Canadian	1,005	.....	25
Foreign	42,003,384	56,121,042	29,252,140
Gold bullion—			
Canadian	5,019,346	48,914,498	409,577
Foreign	.....	.....	.....
Total—Canadian	**5,020,351**	**48,914,498**	**409,602**
Foreign	**42,003,384**	**56,121,042**	**29,252,140**
Gold-bearing quartz, dust, nuggets and bullion obtained direct from mining operations	7,881,512	10,457,877	29,995,983
Jewellers' sweepings	336,081	436,939	423,642

WORLD OUTPUT

Table 67.—Comparative Figures of Gold Production, for the World, Africa, United States and Canada, 1898-1929

Year	*World's output	†Africa's output	*United States' output	Canada's output
	Fine ounces	Fine ounces	Fine ounces	Fine ounces
1898	13,904,363	3,823,307	3,118,398	666,386
1899	14,837,775	3,637,713	3,437,210	1,028,529
1900	12,315,135	348,761	3,829,897	1,350,057
1901	12,740,746	258,032	3,805,500	1,167,216
1902	14,354,680	1,718,921	3,870,000	1,032,161
1903	15,768,387	2,971,427	3,560,000	911,559
1904	16,780,913	3,770,996	3,892,480	796,374
1905	18,396,451	4,908,281	4,205,742	684,951
1906	19,471,080	5,793,159	4,565,333	556,415
1907	19,997,260	6,452,180	4,374,827	405,517
1908	21,430,438	7,057,100	4,574,340	476,112
1909	21,982,713	7,296,832	4,821,701	453,865
1910	22,022,180	7,531,386	4,657,017	493,707
1911	22,348,813	8,251,240	4,687,053	473,159
1912	22,549,335	9,108,792	4,520,719	611,885
1913	22,249,596	8,798,713	4,299,784	802,973
1914	21,240,416	8,396,068	4,572,976	773,178
1915	22,760,788	9,096,411	4,887,604	918,056
1916	22,107,669	9,296,964	4,479,057	930,492
1917	20,289,546	9,018,389	4,051,440	738,831
1918	18,556,920	8,418,379	3,320,784	699,681
1919	17,695,037	8,331,651	2,918,628	766,764
1920	16,205,029	8,158,455	2,476,166	765,007
1921	15,974,962	8,128,710	2,422,006	926,329
1922	15,451,945	7,009,858	2,289,235	1,263,364
1923	17,790,597	9,149,073	2,426,495	1,233,341
1924	19,031,001	9,575,040	2,446,338	1,525,382
1925	19,025,942	9,597,592	2,319,920	1,735,735
1926	19,349,118	9,954,762	2,238,616	1,754,228
1927	19,397,757	10,122,491	2,117,253	1,852,785
1928	19,755,622	10,354,264	2,144,720	1,890,592
1929	19,496,721	*11,384,905	2,056,629	1,928,308

* Figures taken from annual report of the Director of the Mint, Washington.
† From the Year Book of the Union of South Africa.

Table 68.—World Production of Gold, 1926-1929

(From the Annual Report of the Director of the Mint, Washington)

—	1926	1927	1928	1929
	Fine ounces	Fine ounces	Fine ounces	Fine ounces
NORTH AMERICA—				
United States	2,238,616	2,117,253	2,144,720	2,056,629
Canada	1,754,228	1,844,544	1,890,592	1,928,308
Mexico	772,661	725,175	699,102	651,873
Total	4,765,505	4,686,972	4,734,414	4,636,810
(1)Central America and West Indies	87,075	72,563	60,469	53,212
SOUTH AMERICA—				
Argentina(2)	2,419	967	968	1,000
Bolivia	(2) 332	241	506	1,499
Brazil	102,108	(2) 100,000	100,115	107,381
Chile	59,132	(2) 60,000	28,806	28,808
Colombia	71,658	72,563	40,323	48,375
Ecuador	62,486	64,242	74,572	67,328
Guiana—				
British	6,516	5,714	5,325	6,385
Dutch	7,526	7,684	5,498	2,975
French	45,235	48,354	45,460	46,183
Peru	120,241	92,656	66,904	122,138
Venezuela	30,542	39,366	48,257	43,206
Total	508,195	491,787	416,734	475,276
EUROPE—				
Austria	1,318	129	321	.....
Czechoslovakia	7,716	(2) 7,500	6,944	5,015
France	42,010	45,010	54,013	54,012
Germany	5,208	(2) 5,000	5,434	5,819
Great Britain	.....	.....	129	12
Greece	.....	482	482	482
Italy	1,704	2,154	1,865	1,543
Jugoslavia	10,384	12,410	14,468	18,455
Norway	.....	.....	.....	.....
Poland	.....	.....	.....	.....
Rumania	55,652	66,165	62,628	71,148
Russia	992,155	1,060,950	(2) 1,200,000	(2) 1,000,000
Spain	967	967	726	483
Sweden	14,789	14,789	(2) 14,000	(2) 10,000
Total	1,131,903	1,215,556	1,361,010	1,166,969
ASIA—				
British India	(2) 383,970	384,268	376,058	363,869
China	110,000	(2) 100,000	(2) 100,000	(2) 50,000
Chosen (Korea)	190,620	(2) 190,000	166,412	141,667
East Indies—				
British	19,350	19,350	.....	.....
Dutch	115,354	113,071	110,242	107,899
Federated Malay States	14,475	10,706	18,693	24,431
Indo-China	321	321	257	514
Japan	307,862	(2) 308,000	334,061	(2) 334,061
Philippine Islds	91,242	79,314	106,641	160,626
Sarawak	243	243	(2) 200	1,405
Taiwan	9,035	(2) 9,000	9,012	(2) 9,012
Turkey	964	964	900	900
Total	1,243,436	1,215,237	1,222,476	1,194,384
OCEANIA—				
Australia—				
New South Wales	19,435	18,032	12,831	11,096
Northern Territory	140	174	100	44
Queensland	9,086	37,979	13,277	9,476
South Australia	758	418	532	643
Victoria	49,078	38,538	33,917	26,275
West Australia	437,343	408,353	393,408	377,176
Tasmania	4,166	4,860	3,603	5,597
Papua	6,388	6,150	55,573	See New Guinea
New Guinea—				
Australian	.....	.....	55,573	30,281
British (Papua)	.....	.....	.....	1,729
New Zealand	(2) 125,777	129,519	118,714	116,848
Total	652,171	644,023	687,528	585,165
AFRICA—				
Ethiopia (Abyssnia)	(2) 20,000	21,605	9,131	4,501
Algeria	.....	.....	.....	.....
Belgian Congo	132,201	125,417	138,116	172,838
Bechuanaland	4,296	3,807	1,748	1,725
British West Africa (Gold Coast, Ashanti, Nigeria)	199,666	171,607	157,901	208,033
Egypt	643	64	64	64
French West Africa	9,966	6,848	3,279	4,147
Kenya Colony	779	655	814	845
Madagascar	9,870	10,352	7,169	6,012
Portuguese East Africa	9,127	9,521	4,239	375
Rhodesia—				
Northern	779	350	602	699
Southern	593,429	581,438	576,112	560,813
Southwest Africa	.....	984	542	377
Swaziland	1,309	1,135	347	90
Sudan	8,714	7,166	5,835	2,459
Tanganyika	7,202	8,179	12,828	9,581
Transvaal, Cape Colony and Natal	9,962,852	10,122,491	10,354,264	10,412,326
Total	10,960,833	11,071,619	11,272,991	11,384,905
Total for world	19,349,118	19,397,757	19,755,622	19,496,721

(1) Estimate based on United States imports of ore and bullion. (2) Estimate based on other year's production.
(3) Amount exported.

CHAPTER THREE

THE SILVER MINING INDUSTRY IN CANADA

Including the Silver-Cobalt Mining Industry, the Silver-Lead-Zinc Mining Industry, and Commodity Statistics Tables on Arsenic, Cobalt, Silver, Lead and Zinc.

1. General Review.
2. The Silver-Cobalt Mining Industry.
3. The Silver-Lead-Zinc Mining Industry.
4. Commodity Statistics—including tables showing production by provinces, imports, exports, prices, and world output of Arsenic, Cobalt, Silver, Lead and Zinc.

1. General Review

(a) *Definition of the Industry.*—Silver mining is not a distinct industry in Canada, as silver is found, as an ore, only in association with those of other commercially valuable metals; with lead and zinc, as in many of the western mines; with the cobalt and nickel arsenides of northern Ontario, and in copper and other metalliferous ore deposits. Silver is nearly always found alloyed or associated with both alluvial and lode golds from which it is recovered in the refining of the crude gold bullion. This precious metal is, therefore, a rather common constituent in many of our mineral deposits, especially in those of the non-ferrous ores, and its value as a mine product is often a deciding factor in the economical working of an ore body. It is the paramount value in the rich native silver-cobalt ores of Ontario, while in the silver-lead-zinc industry it is usually recovered as an important by-product. The mining and smelting of argentiferous lead and zinc ores are very important industries, especially in British Columbia, and the silver recovered from this type of ore is a distinct contribution to the mineral production of Canada. It is realized then, that the mining and metallurgy of silver bearing ores are closely interwoven with those of other important metals principally lead and zinc and in order to make a comprehensive survey of the Canadian silver production it is imperative to consider its various sources of origin.

(b) *Historical.*—History pertaining to early Canadian silver and lead mining is meagre. We find in Cape Breton, evidence of early colonial efforts to mine galena ores, and from the records of the French regime we find mention by Champlain of argentiferous galena on the east shore of Lake Temiskaming, this deposit being later worked under the name of the Wright mine. It is stated that early last century small shipments of galena ore were made to Europe from deposits on the east shore of Hudson's Bay. In Ontario, silver-bearing veins were found as early as 1846 in the vicinity of Thunder Bay on Lake Superior. It was not until 1866 that Thomas McFarlane discovered in this district high grade silver ore in important commercial quantities. This a sensational "find", was made on a small rocky island not more than 90 feet in diameter and located but a short distance off Thunder Cape. The property, later known as the Silver Islet mine, produced until 1884, the year of its abandonment, approximately $3,250,000 in silver. Some of the other producing mines of this period in the Port Arthur district were the Silver Mountain, Beaver, Rabbit Mountain and Porcupine.

Construction of the Temiskaming and Northern Ontario railroad during 1903 was highly instrumental in the finding of one of the world's richest silver areas. Grading operations along what was then known as Long Lake in northern Ontario revealed veins possessing a mixture of unfamiliar minerals, leaves and wires of a white sectile metal were found on the surfaces of pinkish coated (erythrite) vein fillings. It was only after specimens of these "queer rocks" were sent south for identification and the announcement officially made of the discovery of important native silver and cobalt ores that the country became keenly interested. Silver discoveries and mine development in the South Lorraine and Gowganda areas followed shortly after the original finds at Cobalt and represent the results attained in the widened sphere of the prospecting activity subsequent to the first "boom" in Coleman township.

History is silent as to any important silver production or discoveries in the Prairie Provinces or Territories. Small amounts have been recorded as coming from either Manitoba or Alberta and chiefly represent the metal recovered in the refining of crude gold bullion. The dawn, or

perhaps more aptly put, the false dawn of the silver-lead mining industry in British Columbia reaches back into the early decades of placer prospecting. The gravel miners penetrating the unexplored upper waters of the auriferous streams eventually encountered widespread evidence of metalliferous deposits. Rich float found in the valley bottoms was often traced up the mountain sides to its source of origin and sometimes resulted in the discovery of potential mines. Early development and exploration was greatly delayed by lack of railroad facilities and it was not until late in the eighties that any appreciable production was registered. Small shipments aggregating $37,925 were made in 1887 from various camps in the Kootenay district. It may be of interest, to note here, that the Monarch mine at Field, discovered in 1884, was a small shipper during 1887 and now after 45 years of intermittent operation has been reopened under sound financing and is again shipping silver-lead-zinc ores under much more modern and efficient mining methods. Active operations in the Ainsworth camp date from about 1888 and those in the Sandon-Silverton areas from about 1892. The discoveries of the North Star, Saint-Eugene and famous Sullivan deposits were made in East Kootenay during 1892 and 1893.

A rather common and outstanding characteristic of these usually complex ores is the intimate intermixture of the different sulphides, the clean separation of which is an essential to efficient smelting. Early methods of hand-sorting and crude jigging were for the most part futile, penalties devoured the miners' profits and the hill sides were left with deserted workings. Intensive research and untiring effort have largely solved this perplexing problem through the introduction of selective flotation and, in the almost continuous expansion and improvement of the great smelting, ore dressing, and other works of the Consolidated Mining and Smelting Company at Trail, we read the history of an immense and successful Canadian industry. Gold was discovered in the Yukon river as early as 1869 and we find in succeeding years a synchronous silver production which originated in the alluvial recoveries of the former crude metal. These silver values mounted to impressive figures during the height of the Klondike placer operations. Some argentiferous lode discoveries were made in the Yukon during 1899, but there appears to have been little, if any, production therefrom until 1910, in which year an output of 37,418 ounces of vein silver was recorded. In July, 1919, L. Beauvet made the first outstanding discovery of valuable silver-lead ores in commercial quantities. This find occurred at Keno Hill 40 miles northwest of the town of Mayo. Ore shipments from these deposits commenced during the winter of 1920-1921. It was during the latter year that the rich Sadie-Friendship vein was found. All ores and concentrates from this area are shipped to outside plants for smelting. Cost of transportation has always been a very important factor in the economical working of these mines. In the early days of the camp horse haulage of the ore to Mayo was nearly half the cost of shipping from mine to smelter, however, in 1922-23 the Treadwell-Yukon Company introduced caterpillar tractors reducing this item by nearly two-thirds. It is interesting to note that the frost zone in the Mayo district extends, at some mines, to a depth of over 400 feet.

(e) *Sources of Silver, Lead, Zinc, Cobalt and Arsenic.*—Statistics on the production of silver from Canadian ores include *(a)* silver contained in silver and gold bullion produced, *(b)* silver contained in blister copper or lead bullion made, and *(c)* silver estimated as recoverable from ores of all kinds exported for treatment in foreign smelters.

Figures on lead include lead contained in base bullion made at the Trail smelter, lead estimated as recoverable from silver-lead-zinc ores shipped from mines of the Yukon, and from the lead-zinc properties of Quebec, and including the pig lead made at Galetta in Ontario, with also small quantities of lead contained in silver-lead-bismuth bullion recovered by the smelters treating cobalt ores.

Most of Canada's zinc output is in the form of refined metal produced by the Consolidated Mining and Smelting Company at Trail, B.C. The remainder represents zinc estimated as recoverable from ores, concentrates and residues exported for treatment in foreign smelters.

For the past two decades the ores of the Cobalt district of Ontario have been the main source of the world's supply of cobalt, but since 1926, owing to the production of cobalt by the Union Miniere du Haut Katanga, from Central African copper-bearing ores, Canada's production was reduced to less than half of the world's output.

Arsenic is produced in Canada from the cobalt-silver-nickel-arsenic ores of the Cobalt district by the smelter of the Deloro Smelting and Refining Company Limited, at Deloro, Ontario. Some arsenic is also contained in the concentrates shipped to the Tacoma smelter by the Nickel Plate gold mine of British Columbia, but owing to the low price prevailing during the past two years this company has had little or no return for the arsenic.

(d) *Importance of these metals.*—Lead production in Canada holds sixth place, silver ninth place, and zinc tenth place in point of value among the metals and minerals produced. In 1929 Canada ranked third among the world's silver-producing countries; Mexico produced 108·7 million ounces; and the United States 60 million ounces. In the production of lead Canada was surpassed by the United States, Mexico and Australia. In smelter output of zinc, the United States had the highest production of any country, being followed by Belgium, Poland, Germany, France, and Canada in the order named. In the production of cobalt, Canada and Central Africa produced about equal amounts. From 1904 to 1910 the cobalt production figures represent an estimate of the cobalt content of the ores shipped from the mines, a large part of which was not recovered. From 1911 until the present time cobalt production is computed by adding the cobalt content of all cobalt metal oxides and salts sold by the Ontario smelters to the cobalt paid for in ores and residues exported for treatment in foreign smelters, thus representing a true figure of Canada's cobalt production since that time.

Reliable world's figures on the production of arsenic are very difficult to obtain, but the best available information is shown in Table 85. Because of its low price and the instability of demand, smelters operating long distances from the markets do not attempt its complete recovery.

2. The Silver-Cobalt Mining Industry

Mining and milling only are considered in this chapter: smelting of the cobalt ores, in so far as Canadian operations are concerned, is treated in the chapter on "The Non-Ferrous Smelting and Refining Industry."

After the remarkable Silver Islet production, comparatively little silver was produced in Ontario until the discovery of the mineral wealth of the Cobalt area in 1905. From 1905, when the output of silver was over 2,000,000 ounces, the production increased rapidly until the peak year was reached in 1911. In that year Ontario's production of silver was 30,540,754 ounces. In the following year production declined to 29,000,000 ounces and thereafter followed a generally downward trend until 1921, when less than 10,000,000 ounces were reported; in 1929 production in Ontario amounted to 8,890,726 ounces.

Ontario is the only province producing cobalt and refined arsenic. Some of the older properties around Cobalt have been worked out, but other mines in South Lorrain, Gowganda and in the old Cobalt camp itself, assist in keeping production fairly constant. The increase in gold production also assists in Ontario's silver output, as the gold from the Porcupine and Kirkland Lake camps carries an average of 16 ounces of silver to every 100 ounces of gold. A small amount of silver is also obtained as a refinery by-product from the nickel-copper ores of the Sudbury district.

In 1929 there were 19 silver-cobalt mines producing, or shipping from old dumps. Of these 21 were operating in the Cobalt area, 3 in South Lorrain and 3 in the Gowganda district. The O'Brien mine was the principal silver producer in this group. Other large mines in order of their production were, Nipissi,ng Miller Lake O'Brien, Mining Corporation, Castle-Tretheway, Keeley and Frontier Lorrain.

The Nipissing Mining Company, Limited, was the only mining company in Ontario producing refined silver in 1929. Other mines in the district shipped ore to the Nipissing mill, to the mill of the Cobalt Reduction Company, to the Deloro Smelting and Refining Company, and to foreign smelters.

Table 69.—Statistics of Silver-Cobalt Mine and Mill Operations in Canada, 1928 and 1929

—	Unit of measure	1928	1929
Number of mines in operation		19	32
Ore mined	Tons	260,644	242,591
Ores treated	Tons	252,670	235,546
Tailings treated	Tons	.....	.....
Concentrates produced	Tons	4,649	3,996
Quantity of material cyanided	Tons	63,592	45,421
Bullion recovered	Fine ounces	1,886,958	1,546,165
Bullion recovered by direct smelting	Fine ounces	.....	.....
Bullion sold	Fine ounces	1,815,661	1,367,063
Net value of bullion	$	1,055,485	736,294

Table 70.—Shipments of Ores, Concentrates and Residues from the Cobalt Camp, Ontario, 1928 and 1929

Kind	Quantity	Net value (a)	Metallic content paid for		
			Silver	Cobalt	Copper
1928	tons	$	fine ounces	lb.	lb.
To Canadian Smelters—					
Ores	705	544,693	926,596	274,803	.....
Concentrates and residues	2,595	1,894,038	3,486,949	208,826	.....
To Foreign Smelters—					
Concentrates and residues	2,825	444,668	676,907	203,772	44,475
Total	**6,125**	**2,883,399**	**5,090,452**	**687,401**	**44,475**
1929					
To Canadian Smelters—					
Ores	576	624,786	1,381,029	280,043	.....
Concentrates	2,356	2,185,493	4,405,742	196,441	.....
To Foreign Smelters—					
Concentrates and residues	2,263	371,743	635,602	164,542	26,731
Total	**5,195**	**3,182,022**	**6,422,373**	**641,026**	**26,731**

(a) Net value is the actual amount received by the operator.

Table 71.—Capital Employed in the Silver-Cobalt Mining Industry in Canada, 1928 and 1929

—	1928	1929
	$	$
Capital employed as represented by—		
Cost of lands, buildings and equipment	16,765,127	10,537,310
Cost of supplies and stock on hand	930,891	262,569
Cash, trading and operating accounts and bills receivable	4,331,672	5,020,556
Total	**22,027,683**	**15,820,435**

Table 72.—Employees, Salaries and Wages in the Silver-Cobalt Mining Industry in Canada, 1928 and 1929

—	1928		1929	
	Number	Salaries and wages	Number	Salaries and wages
		$		$
SALARIED EMPLOYEES—				
Total	91	246,284	96	235,450
WAGE-EARNERS—				
Surface	210	1,563,182	297	1,296,883
Underground	692		648	
Mill	170		108	
Total	1,072	1,563,182	1,053	1,296,883
Total	**1,166**	**1,809,466**	**1,149**	**1,532,333**

Table 73.—Wage-Earners in the Silver-Cobalt Mining Industry in Canada by Months, 1928 and 1929

Month	1928				1929			
	Mine		Mill	Total	Mine		Mill	Total
	Surface	Underground			Surface	Underground		
January	178	687	172	1,037	269	660	110	1,039
February	193	709	175	1,077	261	636	110	1,007
March	181	709	166	1,056	245	599	109	953
April	181	677	167	1,025	238	594	107	939
May	213	675	164	1,052	277	597	108	982
June	204	641	160	1,005	271	592	106	969
July	210	659	166	1,035	274	637	107	1,018
August	228	655	159	1,042	280	636	108	1,024
September	236	657	162	1,055	292	633	105	1,030
October	236	668	161	1,065	293	638	107	1,038
November	194	661	157	1,012	294	660	108	1,062
December	201	679	155	1,035	290	602	109	1,001

3. The Silver-Lead-Zinc Mining Industry

Canada

Producing, concentrating, smelting and refining of ores of the silver-lead-zinc group is an industry that is fairly well confined to the province of British Columbia; but as already noted there are silver-lead properties in the Yukon, lead at the Galetta and Errington properties in Ontario and silver-lead-zinc at Notre Dame des Anges in Quebec.

The Consolidated Mining and Smelting Company, Limited, of Trail, B.C., in addition to buying ores and concentrates for the smelter, operates a large customs concentrator which is of great assistance to the smaller mines within a reasonable shipping distance.

Quebec

Mining or exploration of silver-lead-zinc ores in Quebec has been carried on at Notre Dame des Anges since the discovery of this deposit in 1910. Mineralization consists of an intimate mixture of argentiferous galena and zinc blend which occurs both massive and desseminated in a rather well defined fissure intersecting gneisses and metamorphic rocks of pre-Cambrian age. Several early attempts to concentrate this ore failed, but more recently, as the result of a selective flotation process, worked out by the Mines Branch, Ottawa, economic recovery of silver-lead-zinc has been successful. During 1929 there were 29,798 tons of lead and zinc concentrates shipped from this property to foreign smelters. Considerable development and exploration work was done during the year on an extensive system of lead-zinc quartz veins in Lemieux township, Gaspé.

Ontario

Lead and zinc mineralization is fairly common in certain sections of Ontario. Several years ago lead ores were mined and smelted in Frontenac and Hastings counties. At the present time the greater part of the Ontario lead production comes from the Kingdon mine at Galetta. All of these deposits possess more or less common characteristics; the veins are usually in or adjacent to crystalline limestones of the Grenville series, and the vein matter consists of calcite, galena and zinc blende. A distinctly different type of lead deposit is being developed at the Errington mine in the Sudbury field where ore deposition occurs in a major fault zone passing through slates and tuffs of pre-Cambrian age. The crushed zone is, in places, several hundred feet wide, development indicates that the ore occurs in a number of separate and often parallel shoots. Ore consists of quartz, carbonate, rock inclusions and massive iron pyrites; the last mineral has been replaced, in part, by zinc blende, galena and copper pyrites. An average assay of ore from the Ollier Stope in the Errington was 0·033 ounces gold, 2·08 ounces silver, 1·08 per cent copper, 1·20 per cent lead, and 6·4 per cent zinc. Mineral separation is by differential flotation and the concentrates are shipped to foreign plants for metal recoveries.

British Columbia

In 1929 British Columbia held first place among the silver, lead and zinc producing provinces. Production of these three metals from the silver-lead ores of this province has increased very rapidly during the past few years and at the present time British Columbia contributes 43 per cent of Canada's total silver, 94 per cent of the lead, and 87 per cent of the zinc. In 1897 and 1901 five million ounce silver productions were recorded, the metal coming largely from the silver-lead ores of the Kootenays. A recession to two million ounces in 1911 was followed by an almost steady increase from that time until the present day. Factors contributing to this recent expansion of the industry include:—emergency war requirements; the successful application of flotation methods to complex silver-lead ores; heavy world-wide metal consumption; high lead-zinc-silver prices; and widespread mining activity, an activity especially pronounced at the Premier and Sullivan mines. During 1929 energetic development and exploration were carried on at the Premier; metal production for the year from this property amounted to 96,636 ounces of gold and 2,258,729 ounces of silver. The same company was very active throughout the year at the Porter-Idaho and Prosperity mines, the latter being brought into production in November. At Kimberley important extensions were made to the Sullivan concentrator increasing its capacity from 4,000 to 6,000 tons a day. Development at the mine progressed at a rate of 1,000 feet a month and more ore is being continually added to the already immense reserves. Total shipments of all classes of ore from this deposit, to the end of 1929, are estimated at 10,178,000 tons.

A 300-ton concentrator was constructed by the Base Metal Mining Corporation at the Monarch mine near Field, this plant commenced production before the end of the year. Outcrops of the Monarch ore bodies are situated on the precipitous face of a mountain almost 800 feet vertically above the Canadian Pacific Railway. Principal development is on the west deposit which has been explored for a length of 850 feet revealing continuous ore throughout. Thickness of ore varies from 20 to 40 feet as exposed in raises. Deposits lie in flattened troughs of limestone and average 26 per cent combined metals in the proportion of about 14 per cent lead and 12 per cent zinc, the silver content is estimated roughly at 2 ounces per ton, ore minerals are supposed to be remarkably uniform in distribution.

In addition to the Trail silver production there is a large tonnage of British Columbia argentiferous ores shipped to American plants for metal recoveries. This is mined chiefly along the coast and consists largely of sulphides from which copper and gold extractions are of prime importance.

District of Mackenzie

Deposits of lead ore situated about 32 miles southwest of Fort Resolution on Great Slave Lake were actively explored in 1929 by the Atlas Exploration Company. It is stated that the occurrences resemble those of the lead-zinc deposits found in Missouri and other Mississippi valley states. The Consolidated Mining and Smelting Company of Canada is an associate in this development.

Yukon

In the Yukon the Keno Hill district is the principal producer of silver and lead. According to a report given to the *Mining Lands Branch* of the Department of the Interior by the Gold Commissioner of the Yukon, it has been shown that ore values continue with depth. In 1929 nine mines were reported as having shipped ores and concentrates. The Treadwell-Yukon Company, the largest producer in the district, completed a concentrator in the summer of 1925 that has worked to full capacity since it was built. Ores from neighbouring mines are treated in the mill, and this feature is much appreciated by the smaller operators who have thus been able to continue development work with the proceeds from the sales of their ores.

Table 74.—Shipments of Lead Ores and Concentrates from Canadian Mines, 1920-1929

(For years 1913 to 1919 see 1928 report on the Mineral Production of Canada)

Year	Shipment		Lead content in pounds	Silver content in ounces
	Tons	Value		
		$		
1920	69,493	2,985,848	36,325,507	2,882,178
1921	15,259	671,313	9,517,616	989,374
1922	27,203	1,803,575	21,335,850	2,163,637
1923	76,886	4,692,755	66,770,926	3,745,129
1924	153,396	12,290,699	180,187,124	4,348,243
1925	208,588	15,420,756	237,675,311	6,024,213
1926	255,048	17,546,728	273,963,827	8,616,164
1927	275,328	13,014,514	308,903,620	8,831,840
1928	255,914	12,178,879	322,239,859	10,287,591
1929	258,203	15,990,117	328,877,236	10,177,926

Table 75.—Shipments of Zinc Ores and Concentrates from Canadian Mines, 1820-1929

(For years 1898 to 1919 see 1928 report on the Mineral Production of Canada)

Year	Shipments		Metallic zinc shipped	Year	Shipments		Metallic zinc shipped
	Tons	Value	Pounds		Tons	Value	Pounds
		$				$	
1920	249,136	1,157,844	91,033,202	1925	173,172	6,481,930	153,980,628
1921	297,406	1,498,716	98,799,093	1926	242,967	8,643,306	188,393,028
1922	356,096	2,357,849	102,975,964	1927	204,823	4,383,586	196,210,320
1923	279,229	1,853,114	96,148,734	1928	310,255	4,715,452	250,476,679
1924	191,369	4,310,271	129,643,631	1929	289,103	6,522,225	283,143,748

Table 76.—Ore Mined and Milled in the Silver-Lead-Zinc Mining Industry, in Canada, 1928 and 1929

Production	Quebec and Ontario	British Columbia	Yukon	Canada
1928	Tons	Tons	Tons	Tons
Ore mined	320,230	1,729,883	47,066	2,097,179
Ore milled	324,290	1,840,252	44,492	2,209,034
Concentrates produced—lead	11,304	210,461	4,876	226,641
Concentrates produced—zinc	27,933	213,856	.....	241,789
Concentrates produced—copper	716	.....	.....	716
1929				
Ore mined	263,611	1,899,534	45,125	2,208,270
Ore milled	309,315	2,000,722	42,402	2,352,439
Concentrates produced—lead	9,189	210,031	5,942	225,162
Concentrates produced—zinc	29,338	242,479	.....	271,817
Concentrates produced—copper	3,245	.....	.....	3,245

Table 77.—Products Shipped by Silver-Lead-Zinc Mines in Canada, 1928 and 1929

Location of mines	No. of mines shipping	Products shipped	Quantity shipped	Net value at shipping point	Total metal content as determined by settlement assay				
					Gold	Silver	Lead	Zinc	Copper
Canada 1928			Tons	$	Oz.	Oz.	Lb.	Lb.	Lb.
Quebec and Ontario	3	Lead ore	.....	.....	.....	.....	.....	.....	.....
		Lead concentrates	11,301	880,729	4,939	622,889	13,315,520	715,804	.....
		Zinc concentrates	25,266	837,703	2,319	155,455	201,510	25,159,052	.....
		Copper concentrates	716	17,570	122	7,045	.....	.....	180,546
		Total	37,283	1,736,002	7,380	785,389	13,517,030	25,874,856	180,546
British Columbia	86	Lead ore	27,130	618,812	1,477	838,745	13,341,062	2,379,353	.....
		Lead concentrates	211,024	9,119,639	1,252	6,055,889	288,366,137	19,734,841	.....
		Zinc ore	70,291	79,653	7	118,459	10,867,555	17,740,782	.....
		Zinc concentrates	214,698	3,798,096	398	674,115	14,434,944	207,576,845	.....
		Dry ore	19,009	148,554	1,111	301,793	64,392	80	.....
		Total	542,152	13,764,754	4,245	7,989,001	327,074,090	247,431,901	.....
Yukon	12	Lead ore	2,914	543,411	197	925,752	3,258,037	.....	1,346
		Lead concentrates	3,575	1,016,288	51	1,844,316	3,959,103	.....	83,002
		Dry ore	297	63,000	.....	127,825	437,556	.....	.....
		Total	6,786	1,622,699	248	2,897,893	7,654,696	.....	84,348
Canada	**101**	.....	**586,221**	**17,123,455**	**11,873**	**11,672,283**	**348,245,816**	**273,306,757**	**264,894**
1929									
Quebec and Ontario	3	Lead ore	.....	.....	.....	.....	.....	.....	.....
		Lead concentrates	9,247	566,960	3,105	382,833	10,350,282	.....	48,098
		Zinc concentrates	31,127	806,556	1,590	140,976	371,840	30,150,566	.....
		Copper concentrates	3,277	130,534	857	39,599	.....	.....	996,781
		Total	43,651	1,504,050	5,552	563,408	10,722,122	30,150,566	1,044,879
British Columbia	89	Lead ore	20,556	783,957	684	909,948	11,380,305	2,271,267	.....
		Lead concentrates	220,546	12,385,385	1,296	5,546,894	298,146,118	24,353,427	1,023
		Zinc ore	2,752	50,002	22	22,512	303,584	1,403,502	.....
		Zinc concentrates	255,224	5,665,667	97	592,413	18,109,563	251,589,680	.....
		Dry ore	19,008	105,213	117	252,051	.....	.....	.....
		Total	518,086	18,990,224	2,216	7,323,818	327,939,570	279,617,876	1,023
Yukon	9	Lead ore	2,687	659,595	45	1,028,668	2,843,660	18,805	14,086
		Lead concentrates	5,167	1,594,220	170	2,309,583	6,156,871	.....	97,049
		Dry ore	.....	.....	.....	.....	.....	.....	.....
		Total	7,854	2,253,815	215	3,338,251	9,000,531	18,805	112,026
Canada	**101**	.....	**569,591**	**22,748,089**	**7,983**	**11,225,477**	**347,662,223**	**309,787,247**	**1,157,928**

Table 78.—Destination of Shipments from Silver-Lead-Zinc Mines in Canada, 1928 and 1929

Product shipped	Tons shipped	Net value at shipping point	Total metal content as determined by settlement assay				
			Gold	Silver	Lead	Zinc	Copper
1928		$	Oz.	Oz.	Lb.	Lb.	Lb.
To Canadian Smelters—							
Lead ore	26,975	607,787	1,477	818,003	13,317,453	2,379,353	.....
Lead concentrates	215,431	9,382,935	1,252	6,055,889	294,948,527	19,734,841	.....
Zinc ore	70,291	79,653	7	118,459	10,867,555	17,740,782	.....
Zinc concentrates	214,735	3,799,758	400	674,239	14,434,944	207,612,371	.....
Dry ore	19,009	148,554	1,111	301,793	64,392	80	.....
Total	**546,441**	**14,018,687**	**4,247**	**7,968,383**	**333,632,871**	**247,467,427**	.....
To Foreign Smelters—							
Lead ore	3,069	554,436	197	946,494	3,281,646	.....	1,346
Lead concentrates	10,469	1,633,721	4,990	2,467,205	10,692,233	715,804	83,002
Zinc ore	.....	.....	.....	.....	.....	.....	.....
Zinc concentrates	25,229	836,041	2,317	155,331	201,510	25,123,526	.....
Dry ore	297	63,000	.....	127,825	437,556	.....	.....
Copper concentrates	716	17,570	122	7,045	.....	.....	180,546
Total	**39,780**	**3,104,768**	**7,626**	**3,703,900**	**14,612,945**	**25,839,330**	**264,894**
1929							
To Canadian Smelters—							
Lead ore	20,529	782,200	684	906,108	11,370,340	2,271,267	.....
Lead concentrates	222,226	12,506,654	518	5,503,611	301,462,774	24,353,427	1,023
Zinc ore	2,752	50,002	22	22,512	303,584	1,403,502	.....
Zinc concentrates	255,224	5,665,667	97	592,413	18,109,563	251,589,680	.....
Dry ore	19,008	105,213	117	252,051	.....	.....	.....
Total	**519,739**	**19,109,736**	**1,438**	**7,276,695**	**331,246,261**	**279,617,876**	**1,023**
To Foreign Smelters—							
Lead ore	2,714	661,352	45	1,032,508	2,853,625	18,805	14,086
Lead concentrates	12,734	2,039,911	4,053	2,735,699	13,190,497	.....	146,038
Zinc ore	.....	.....	.....	.....	.....	.....	.....
Zinc concentrates	31,127	806,556	1,590	149,976	371,840	30,150,566	.....
Dry ore	.....	.....	.....	.....	.....	.....	.....
Copper concentrates	3,277	130,534	857	39,599	.....	.....	996,781
Total	**49,852**	**3,638,353**	**6,545**	**3,948,782**	**16,415,962**	**30,169,371**	**1,156,905**

Table 79.—Capital Employed in the Silver-Lead-Zinc Mining Industry in Canada, 1928 and 1929

Province	Capital employed as represented by			
	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total
1928	$	$	$	$
Nova Scotia and Quebec	1,211,695	60,167	862,285	2,134,147
Ontario	4,701,986	175,412	405,505	5,282,903
British Columbia	25,654,196	1,260,823	639,221	27,554,240
Yukon	2,782,769	796,940	343,893	3,923,602
Canada	**34,350,646**	**2,293,342**	**2,250,904**	**38,894,892**
1929				
Nova Scotia and Quebec	5,945,159	63,632	992,751	7,001,542
Ontario	6,692,029	187,106	276,069	7,155,204
British Columbia	30,537,808	1,454,444	850,661	32,842,913
Yukon	2,597,390	852,355	124,257	3,574,002
Canada	**45,772,386**	**2,557,537**	**2,243,738**	**50,573,661**

Table 80.—Employees, Salaries and Wages in the Silver-Lead-Zinc Mining Industry in Canada, 1928 and 1929

Province	1928						1929					
	On salary	Mine		Mill	Total	Salaries and wages	On salary	Mine		Mill	Total	Salaries and wages
		Surface	Underground					Surface	Underground			
						$						$
Nova Scotia and Quebec	18	122	143	21	304	354,378	27	123	139	21	310	336,959
Ontario	48	221	311	31	611	624,338	42	92	246	35	415	713,034
British Columbia	222	849	1,032	475	2,578	4,116,029	290	1,021	1,357	552	3,220	4,875,129
Yukon	14	76	86	11	187	436,889	12	100	84	12	208	557,290
Canada	**302**	**1,268**	**1,572**	**538**	**3,680**	**5,531,634**	**371**	**1,336**	**1,826**	**620**	**4,153**	**6,482,392**

Table 81.—Wage-Earners in the Silver-Lead-Zinc Mining Industry in Canada, by Months, 1928 and 1929

Month	1928				1929			
	Surface	Underground	Mill	Total	Surface	Underground	Mill	Total
January	792	1,322	433	2,547	870	1,588	481	2,939
February	859	1,311	433	2,603	898	1,511	491	2,900
March	922	1,365	439	2,726	935	1,572	506	3,013
April	955	1,434	458	2,847	1,002	1,512	495	3,009
May	1,135	1,429	496	3,060	1,158	1,612	550	3,320
June	1,181	1,439	517	3,137	1,307	1,725	602	3,634
July	1,324	1,474	530	3,328	1,375	1,720	645	3,740
August	1,409	1,446	542	3,397	1,352	1,693	647	3,692
September	1,410	1,471	545	3,426	1,328	1,652	597	3,577
October	1,385	1,563	577	3,525	1,235	1,715	625	3,575
November	1,240	1,492	554	3,286	1,033	1,711	582	3,326
December	1,034	1,487	545	3,066	932	1,580	510	3,022

4.—Commodity Statistics—including tables showing production by provinces, imports, exports, prices, and world output of Arsenic, Cobalt, Silver, Lead and Zinc.

ARSENIC

The greater part of the Canadian production of arsenic is recovered as a by-product in the treatment of the Temiskaming cobalt ores in Ontario metallurgical plants. In British Columbia auriferous arsenical concentrates shipped from the Nickel Plate mine to the Tacoma smelter constitute the source of the arsenic production in this province. The United States and Mexico together recover probably more than two-thirds of all the arsenic produced annually in the world and this, together with imports from other countries is all consumed in the United States.

Principal uses of white arsenic are in the manufacture of insecticides, weed killers, glass, cattle and sheep dips, wood preservatives, pigments and leather. In the southern states arsenic in the form of calcium arsenate is used in very large quantities for bollweevil control and in Canada experiments have been made in the dusting of forests with arsenic in an attempt to lessen the ravages of insect life.

Table 82.—Production of Arsenic in Canada, 1920-1929

(For production from 1885-1919, see Annual Report Mineral Production 1928)

Year	Arsenic in ore		White arsenic		Year	Arsenic in ore		White arsenic	
	tons	$	tons	$		tons	$	tons	$
1920	628	22,231	1,831	425,617	1925	714	21,513	1,003	108,789
1921	.....	.....	1,491	233,763	1926	545	12,687	1,992	134,124
1922	518	21,097	2,058	299,940	1927	667	15,644	2,447	196,335
1923	631	44,030	2,579	582,785	1928	708	16,539	2,008	176,513
1924	513	39,185	1,798	309,108	1929	766	17,314	1,849	154,006

Table 83.—Production, Exports and Imports of Arsenic, (As_2O_3), for Canada, 1927-1929

—		1927		1928		1929	
		Quantity	Value	Quantity	Value	Quantity	Value
			$		$		$
PRODUCTION—							
From arsenical concentrates exported	lb.	1,333,421	15,644	1,416,805	16,539	1,531,218	17,314
White arsenic	lb.	4,894,547	196,335	4,015,418	176,513	3,698,870	154,006
Total	**lb.**	**6,227,968**	**211,979**	**5,432 223**	**193,052**	**5,230,088**	**171,320**
EXPORTS—							
Arsenic, As_2O_3	lb.	3,856,600	124,823	3,194,900	122,106	3,167,300	123,398
IMPORTS—							
White arsenic	lb.	286,377	11,833	333,113	13,976	123,224	5,341
Sulphide of arsenic	lb.	16,245	1,593	94,380	5,566	18,295	1,865
Arseniate of soda	lb.	25,148	4,024	360	83	1,456	156

Table 84.—Monthly Average Prices of Arsenic, 1927-1929

(From *Engineering and Mining World*)

Month	New York, in cents per pound		
	1927	1928	1929 (a)
January	3·50	4·00	4·5
February	3·75	4·00	4·5
March	3·75	4·00	4·5
April	3·75	4·00	4·5
May	3·75	4·00	4·5
June	3·75	4·00	4·5
July	3·75	4·00	4·5
August	4·00	4·00	4·5
September	4·00	4·00	4·5
October	4·00	4·00	4·5
November	4·00	4·00	4·5
December	4·00	4·00	4·5
Average	**3·83**	**4·00**	**4·5**

(a) The 1929 prices are from "Canadian Chemistry and Metallurgy."

Table 85—World Production of Arsenic Ore and White Arsenic, 1922-1928, in metric tons.

(Compiled by L. M. Jones, of the Bureau of Mines Washington, D.C., U.S.A.)

Country and product	1922	1923	1924	1925	1926	1927	1928
Algeria:							
Arsenate of lead—							
Gross weight	160	2,270	9,335	6,750	3,665	2,482	1,201
Arsenic content	34	409	1,587	1,215	733	546	300
Australia:							
New South Wales—							
Ore and concentrates	[1]	11,677	4,487	3,400	[1]1,796	755	5,924
White arsenic	296	367	328	301	202	[1]	50
Queensland—							
Ore	[1]	[1]	[1]	1,123	828	71	.....
White arsenic	406	620	573	.....	.....	.....	.....
South Australia—							
Ore—							
Gross weight	.....	.....	69	102	.....	.....	.....
Arsenic content	.....	.....	[1]	[1]	.....	.....	.....
Victoria—							
White arsenic	[1]	1,036	437	[1]	[1]	[1]	[1]
Western Australia—							
Ore[2,3]							
Gross weight	1,092	.....	.....	.....	.....	.....	.....
Arsenic content	[1]	.....	.....	.....	.....	.....	.....
Austria:							
Ore[3,4]							
Gross weight	.....	.....	560	89	.....	.....	.....
Arsenic content	.....	.....	40	15	.....	.....	.....
Arsenic content of gold ores	103	136	216	237	155	14	.....
Belgium:							
White arsenic	1,008	1,380	1,850	[1]	[1]	[1]	[1]
Brazil:							
White arsenic	154	162	146	[1]	51	[1]	[1]
Canada:							
White arsenic	1,867	2,340	1,631	910	1,807	2,220	1,821
Arsenic content of ores and concentrates[1,2]	470	572	465	648	495	605	643

Table 85.—World Production of Arsenic Ore and White Arsenic, 1922-1928, in metric tons—Concluded

(Compiled by L. M. Jones, of the Bureau of Mines, Washington, D.C., U.S.A.)

Country and product	1922	1923	1924	1925	1926	1927	1928
China:							
Ore[2,3]	549	413	472	395	[1]	[1]	[1]
White arsenic[2,3]	30	176	237	94	[1]	[1]	[1]
Chosen:							
Ore	56	26	.....	[1]	.....	.....	.....
White arsenic	[1]	95	.....	[2,3]107	.....	.....	.....
Czechoslovakia:							
Ore—							
Gross weight	[1]	24	217	34	4	1[illegible]	[illegible]
Arsenic content	[1]	[1]	[1]	[1]	1	[illegible]	[illegible]
France:							
Ore	4,465	10,022	14,029	30,349	23,256	55,800	74,720
White arsenic	266	815	802	2,217	2,096	[1]	[1]
Germany:							
Ore and concentrates[5]—							
Gross weight	8,750	10,273	10,818	6,626	3,930	4,710	4,373
Arsenic content	2,958	3,363	3,499	2,085	1,353	1,639	1,499
Great Britain:							
Ore	360	741	304	[11]	.....	81	.....
White arsenic and arsenic soot	994	1,631	3,258	2,586	1,693	1,358	1,314
Greece:							
White arsenic	967	1,176	1,096	423	1,148	1,036	709
Italy:							
Ore—							
Gross weight	450	206	147	4	200	81	[1]
Arsenic content	81	46	33	1	35	20	[1]
Japan:							
Ore	2,295	[4]4,245	7,416	[1]	[1]	[1]	[1]
White arsenic	1,922	4,287	3,703	3,485	1,035	1,71[illegible]	1,829
Mexico:							
White arsenic	[7]272	1,402	2,551	7,507	6,458	11,332	12,933
Norway:							
Ore—							
Gross weight	.....	577	.....	.....	.....	.....	.....
Arsenic content	.....	149	.....	.....	.....	.....	.....
Peru:							
Ore	[1]	232	.....	[1]	.....	.....	.....
Arsenic	[1]	[8]115	.....	[9]119	.....	.....	.....
Portugal:							
Ore	106	160	279	76	7	47	155
White arsenic	604	887	874	1,092	354	[1]	[1]
Rhodesia, Southern:							
Ore—							
Gross weight	451	774	533	170	49	38	102
Arsenic content	[1]	[1]	[1]	[1]	[1]	[1]	.....
Spain:							
Ore—							
Gross weight	.....	.....	.....	.....	190	186	.....
Arsenic content	.....	.....	.....	.....	29	28	.....
Sweden:							
Ore—							
Gross weight	.....	.....	80	110	13,149	22,100	22,728
Arsenic content	.....	.....	19	21	2,478	4,420	4,546
Switzerland:							
Ore—							
Gross weight	10	100	[1]	[1]	[1]	.....	.....
Arsenic content	[1]	[1]	[1]	[1]	[1]	.....	.....
Turkey:							
Ore							
Gross weight	[10]200	[1]	[1]	[1]	[1]	.....	.....
Arsenic content	[1]	[1]	[1]	[1]	[1]	.....	.....
Union of South Africa:							
White arsenic	3	5	102	33	38	53	17
United States:							
White arsenic	9,096	12,946	13,111	11,174	10,709	10,487	10,675

[1]Data not available.

[2]Exclusive of output of Ottery Mine, for which data are not available.

[3]Exports.

[4]Exclusive of arsenical gold ores worked primarily for their gold and silver content.

[5]Data relate to concentrates produced and ore sold without concentration.

[6]Incomplete figures, output of principal mines only.

[7]Figures of Mexican Government. The Penoles Co. reports 335 tons shipped.

[8]Content of ore.

[9]White arsenic exported by the Anglo-French Ticapampa Silver Mining Co. (Ltd.)

[10]Year ended Oct. 31.

[11]Production reported, but figures not available for publication.

COBALT

Production figures for Canada include the cobalt content of the various cobalt products sold by the Ontario smelters and the cobalt content of the ores and residues exported for treatment in foreign smelters; the value given is the net amount received by the shippers.

During the past few years Canada's production of cobalt decreased sharply in contrast to the totals for earlier years. This was due largely to new competition in the world's markets arising from the development of properties in Central Africa by the Union Minière du Haut Katanga. Cobalt from this source, computed in terms of the cobalt content of metal, oxides and salts marketed during the year amounted in 1929 to 1,560,832 pounds as compared with 1,008,000 pounds in 1928.

Since the discovery of the Cobalt camp in 1903, by far the greater part of the world's supply of cobalt has been derived from the treatment of ores mined in that area. Two companies, the Coniagas Reduction Company of Thorold, Ontario, (closed down in 1926) and the Deloro Smelting and Refining Company, Limited, at Deloro, Ontario, developed processes for the recovery of cobalt from these ores. A brief outline of the process follows:—

Reduction of the ore in a blast furnace produces a speiss containing silver, cobalt, nickel, a small amount of iron and other metals. The speiss is roasted to free it from arsenic; then chloridized and leached with sulphuric acid to extract the copper, and cyanided to dissolve the silver. Silver in the cyanide solution is precipitated by means of aluminium dust. The "speiss residues" remaining are treated for the recovery of cobalt and nickel in the form of oxides. In some cases the speiss residues are exported.

Cobalt oxide is marketed either as black or gray oxide; the black oxide contains about 70 per cent cobalt metal and the gray, about 75 per cent cobalt metal. Gray oxide is made by giving the black oxide a slight roast in a reducing atmosphere in a reverberatory furnace. Cobalt salts of various kinds are also made, and if the pure metal is required, the black oxide is reduced in the reverberatory furnace using charcoal as the reducing agent.

The market for cobalt which was very poor in 1915 gradually improved during the war. No quotations on the New York market were available during 1918, 1919 and 1920. During 1921 the quotations given in the *Engineering and Mining Journal* ranged from $3 to $3.50 per pound; the former value was used in computing the annual production values. In 1922 the average price $3.25 per pound, was used. In 1923, the quotation, $2.85 was used, but from 1924 to date the values given in the report have been based on the returns actually received by the operators for the products sold. In 1929 the market quotations for cobalt were: metal, $2.52 per pound; cobalt oxide, $2.10 per pound.

A bounty of 6 cents a pound on the metallic content of cobalt and nickel oxides was paid by the Ontario government from 1907 to 1917.

An increase in consumption of cobalt during recent years is due largely to the industrial application of cobalt alloys, especially stellite, cobalt magnet steels and cobalt-tungsten carbides, Konel metal, a new alloy containing Nickel 73 per cent, Cobalt 17 per cent, and ferrotitanium 10 per cent, is reported by the Westinghouse Company. It is at present used for filaments in radio tubes. This alloy possesses an ultimate strength of 66,000 pounds at 600 degrees C. or twice that of chrome steel at the same temperature.

An historical summary of the production in Canada which dates from the year 1904 is shown in the following table. For the years 1904 to 1910 inclusive, the figures given were prepared by the Ontario Bureau of Mines, and represent the estimated cobalt content of the ores shipped from the mines. From 1911 to date, the quantities given are the cobalt content of all smelter products sold or shipped, such as cobalt metal, the oxides, mixed oxides and residues, etc.

Table 86.—*Production of Cobalt from Canadian Ores, 1904-1929

Year	Pounds	Year	Pounds	Year	Pounds
1904	32,000	1913	865,937	1922	616,088
1905	236,000	1914	871,891	1923	760,105
		1915	504,212	1924	948,704
1906	642,000			1925	1,116,492
1907	1,478,000	1916	840,536		
1908	2,448,000	1917	1,079,572	1926	664,778
1909	3,066,000	1918	737,157	1927	880,590
1910	2,196,000	1919	530,371	1928	956,590
		1920	546,023	1929	929,415
1911	1,704,000				
1912	663,093	1921	251,986	Total	25,565,546

*See preceding paragraph.

Table 87.—Production in Canada and Exports of Cobalt, 1927-1929

—	1927		1928		1929	
	Pounds	$	Pounds	$	Pounds	$
PRODUCTION—						
Cobalt, computed as cobalt in metal, oxides and salts sold, and in ores and residues exported	880,590	1,764,534	956,590	1,672,320	929,415	1,801,915
EXPORTS—						
Cobalt alloys, cobalt metallics, cobalt oxides, cobalt salts and cobalt ores	.....	1,678,468	.....	1,734,461	.....	1,786,163

Table 88.—Imports of Cobalt into the United States, 1920-1929

(From *The Mineral Industry*, 1929)

Year	Ore		Cobalt		Zaffer		Oxide	
	Pounds	Value	Pounds	Value	Pounds	Value	Pounds	Value
		$		$		$		$
1920	13,039	4,794	143,603	326,864	220	14	202,724	399,605
1921	7,657	3,235	38,442	105,539	.....	.....	164,003	342,426
1922	5,195	7,075	126,364	321,396	.....	.....	217,530	435,895
1923	58,719	56,326	225,639	552,434	.....	.....	258,574	511,903
1924	28,786	37,276	118,952	264,935	.....	.....	226,703	440,898
1925	34,782	31,320	198,669	422,185	.....	.....	287,265	546,292
1926	154,468	55,820	387,076	820,873	110	40	333,132	632,478
1927	60,382	3,019	407,198	841,442	.....	.....	369,747	703,608
1928	.....	.....	(a)643,315	1,173,496	.....	.....	364,154	692,753
1929	434,443	51,862	806,640	1,743,465	.....	.....	475,928	884,873

(a) Ore and metal.

Table 89.—World Production of Cobalt, 1925-1929

(From "The Mineral Industry of the British Empire"—"Imperial Institute")

—	1925	1926	1927	1928	1929
BRITISH EMPIRE	Pounds	Pounds	Pounds	Pounds	Pounds
Canada (a)	1,116,528	664,832	880,544	956,592	929,376
Australia (b)	201,600	60,480	.....	17,360	44,800
Union of South Africa (Ore)	.....	.....	.....	.....	336
FOREIGN COUNTRIES					
Belgian Congo	428,400	792,960	795,200	1,008,000	1,560,836
Chile	.....	.....	784	3,696	(c)
Germany (Saxony)	15,456	(c)	.....	.....	.....
New Caledonia	32,152	.....	173,264	(c)	(c)

(a) Metal recovered from smelter products, including cobalt contained in cobalt residues exported.
(b) Metal content of concentrates.
(c) Information not available.

SILVER

For many years past the world's output of silver has been obtained chiefly from gold bullion and as a growing by-product in the refining of lead, copper, zinc, and other base metals. There is still, however, in Canada, an important production from the true silver ores as mined in the Cobalt area. Silver declined in price steadily during 1929 and authoritative opinion as to the reasons for this recession is varied. Market saturation from the by-product silver recoveries of the expanding base metal industries, demonetized metal, and political unrest in the Far East are suggested as possible causes. Increased utilization of silver in the trades and arts is being advocated as a stimulus to these abnormally low silver values.

Production—SPECIAL NOTE.—Prior to 1922, the method used in compiling the statistics on the silver production of Canada was to include, except for Ontario, the quantities of silver produced from Canadian ores either in Canadian or foreign smelters. For Ontario, the sales of silver bullion from the mines and smelters were considered as the year's production. In order to bring the practice for Ontario into harmony with that used in computing the silver output for the other provinces, adjustments amounting to 1,222,450 ounces were made for 1922 to take account of the stocks of silver bullion on hand at the end of 1921 which had not been previously included in the reports on the mineral production of Canada.

Table 90.—Production of Silver in Canada, by Provinces and by Sources, 1928 and 1929

—	1928		1929	
	Quantity	Value	Quantity	Value
	Fine ounces	$	Fine ounces	$
NOVA SCOTIA—				
In gold bullion	77	45	132	70
QUEBEC—				
In gold ores, in blister copper and in copper ores and in silver-lead-zinc ores exported	908,959	528,796	813,821	431,269
ONTARIO—				
In silver bullion and nuggets	5,954,880	3,464,311	7,345,561	3,892,633
In gold bullion	242,468	141,058	256,786	136,079
In slags exported from gold mines	5,759	3,350	99	52
In matte, blister copper and in ores, concentrates and residues exported	1,039,494	604,737	1,288,280	682,698
Total	7,242,601	4,213,456	8,890,726	4,711,462
MANITOBA—				
In gold bullion	1,763	1,026	2,644	1,401
ALBERTA—				
In gold bullion	·7	4	.....	.....
BRITISH COLUMBIA—				
In alluvial gold	1,516	882	1,160	615
In gold bullion	1,536	894	1,363	722
In blister copper	770,557	448,279	667,052	353,491
In base bullion and in ores exported	10,169,758	5,916,358	9,486,833	5,027,357
Total	10,943,367	6,366,413	10,156,408	5,382,185
YUKON—				
In alluvial gold	7,676	4,466	8,028	4,254
In ores exported	2,831,957	1,647,519	3,271,502	1,733,667
Total	2,839,633	1,651,985	3,279,530	1,737,921
Canada	**21,936,467**	**12,761,725**	**23,143,261**	**12,264,308**

Table 91.—Production of Silver in Canada, 1887-1929

Year	Fine ounces	Value	Cents per ounce	Year	Fine ounces	Value	Cents per ounce
		$				$	
1887	355,083	347,271	98·00	1909	27,529,473	14,178,504	51·50
1888	437,232	410,998	94·00	1910	32,869,264	17,580,455	53·49
1889	383,318	358,785	93·60				
1890	400,687	419,118	104·60	1911	32,559,044	17,355,272	53·30
				1912	31,955,560	19,440,165	60·83
1891	414,523	409,549	98·00	1913	31,845,803	19,040,924	59·79
1892	310,651	272,130	86·00	1914	28,449,821	15,593,631	54·81
1893	428,738	330,128	77·00	1915	26,625,960	13,228,842	49·68
1894	847,697	534,049	63·00				
1895	1,578,275	1,030,299	65·28	1916	25,459,741	16,717,121	65·66
				1917	22,221,274	18,091,895	81·417
1896	3,205,343	2,149,503	67·06	1918	21,383,979	20,693,704	96·772
1897	5,558,446	3,323,395	59·79	1919	16,020,657	17,802,474	111·122
1898	4,452,333	2,593,929	58·26	1920	13,330,357	13,450,330	100·900
1899	3,411,644	2,032,658	59·58				
1900	4,468,225	2,740,362	61·33	1921	13,543,198	8,485,355	62·654
				1922	18,626,439	12,576,758	67·521
1901	5,539,192	3,265,354	58·95	1923	18,601,744	12,067,509	64·873
1902	4,291,317	2,238,351	52·16	1924	19,736,323	13,180,113	66·781
1903	3,198,581	1,709,642	53·45	1925	20,228,988	13,971,150	69·065
1904	3,577,526	2,047,095	57·22				
1905	6,000,023	3,621,133	60·35	1926	22,371,924	13,894,531	62·107
				1927	22,736,698	12,816,677	56·370
1906	8,473,379	5,659,455	66·79	1928	21,936,467	12,761,725	58·176
1907	12,779,799	8,348,659	65·33	1929	23,143,261	12,264,308	52·993
1908	22,106,233	11,686,239	52·86				
				Total	**583,394,169**	**270,719,545**	.....

Table 92.—Production of Silver from Canadian Ores,* by Provinces, 1920-1929

(For the years 1887 to 1919 see 1928 report on the Mineral Production of Canada)

Year	Quebec		Ontario		British Columbia		Yukon Territory	
	Fine ounces	Value	Fine ounces	Value	Fine ounces	Value	Fine ounces	Value
		$		$		$		$
1920	61,003	61,552	9,907,626	9,096,705	3,327,028	3,356,971	19,190	19,363
1921	38,084	23,861	9,761,637	6,116,037	3,350,357	2,099,133	393,092	246,288
1922	.....	.....	10,811,903	7,300,305	7,150,937	4,828,384	663,493	447,997
1923	33,006	21,412	10,540,943	6,838,226	6,113,327	3,965,899	1,914,438	1,241,953
1924	83,814	55,972	11,272,567	7,527,933	8,153,003	5,444,657	226,755	151,429
1925	214,943	148,451	10,529,131	7,271,944	8,579,458	5,925,403	904,893	624,964
1926	375,986	233,513	9,274,965	5,760,402	10,625,816	6,599,376	2,095,027	1,301,159
1927	740,864	417,625	9,307,953	5,246,893	11,040,445	6,223,499	1,647,295	928,580
1928	938,959	528,796	7,242,601	4,213,456	10,943,367	6,366,413	2,839,633	1,651,985
1929	813,821	431,268	8,890,726	4,711,462	10,156,408	5,382,185	3,279,530	1,737,922

*Does not include small productions from Nova Scotia, New Brunswick, Alberta and Manitoba.

Ontario

Table 93.—Silver in Mine Shipments from Cobalt District and Nearby Camps in Ontario, 1904-1929

(From 1929 *Report of Ontario Department of Mines.*)

Year	Silver shipments in Troy ounces				
	Cobalt area	Casey township	South Lorrain	Gowganda	Montreal River and Maple Mountain
1904	206,875	.....	.....	.....	.....
1905	2,451,356	.....	.....	.....	.....
1906	5,401,766	.....	.....	.....	.....
1907	10,023,311	.....	.....	.....	.....
1908	19,424,251	500	13,124	.....	.....
1909	25,658,683	26,185	194,955	.....	18,002
1910	29,849,981	92,544	221,133	471,688	9,835
1911	29,989,893	114,789	933,912	468,687	510
1912	28,605,940	253,824	834,119	549,976	.....
1913	28,105,505	825,108	248,992	502,370	.....
1914	24,155,699	499,643	108,199	399,300	.....
1915	24,280,366	223,939	.....	242,229	.....
1916	19,008,517	445,900	77,280	383,393	.....
1917	18,327,258	.....	10,000	1,064,635	.....
1918	16,807,407	143,901	72,188	638,198	.....
1919	10,314,689	171,278	4,586	723,764	.....
1920	10,402,249	.....	8,253	433,352	2,467*
1921	7,673,535	1,101	328,886	258,292	117
1922	9,239,147	1,028	1,284,307	170,651	15,994†
1923	7,259,858	.....	2,955,646	160,761	1,581
1924	6,704,787	.....	2,633,058	598,057	.....
1925	6,252,115	.....	3,099,964	1,355,156	.....
1926	6,262,249	.....	3,044,584	1,236,640	.....
1927	4,482,543	.....	2,319,356	1,741,614	.....
1928	3,934,020	.....	1,133,952	1,677,429	.....
1929	4,823,529	.....	876,006	2,081,894	.....
Total	**359,645,529**	**2,799,740**	**20,402,500**	**15,158,086**	**48,506**

* Includes 885 oz. from Silver Islet, Lake Superior.
† Silver Islet, exclusively.

Manitoba

Silver production in Manitoba during the year amounted to 1,763 ounces recovered from crude gold shipped to the Royal Mint at Ottawa. Copper deposits were developed during the war, and from 1918 to 1920 shipments of copper ore containing silver were sent to Trail; in those three years, production from this source amounted to about 50,000 ounces. Owing to the drop in price of copper and to the high freight rates, practically no shipments of copper ores

have been made in recent years. Recent developments in this province indicate that a resumption of production may be looked for at an early date. Copper-gold and copper-zinc properties are being developed; the ores from these deposits are both argentiferous and auriferous indicating a future increase in the precious metal production for this province.

Table 94.—Production of Silver in Manitoba, 1919-1929

Year	Fine ounces	Value
		$
1919	20,700	23,069
1920	15,510	15,649
1921	33	20
1922	20	14
1923	5	3
1924	140	93
1925	477	329
1926	18	11
1927	12	7
1928	1,763	1,026
1929	2,644	1,401

Table 95.—Production of Silver in British Columbia by Districts, 1928 and 1929

(From *Annual Report of the Minister of Mines for British Columbia.*)

District and division	1928		1929	
	Ounces	Value	Ounces	Value
		$		$
Northwestern District (No. 1)—				
Atlin	133	78	.....	.....
Stikine	.....	.....	.....	.....
Liard	.....	.....	.....	.....
Nass River	273,068	158,863	285,394	151,239
Portland Canal	2,369,176	1,378,292	2,373,972	1,258,039
Skeena	1,166	678	328	174
Queen Charlotte	.....	.....	.....	.....
Bella Coola	.....	.....	.....	.....
Northeastern District (No. 2)—				
Cariboo	.....	.....	.....	.....
Quesnel	.....	.....	.....	.....
Omineca	343,653	169,924	261,351	138,498
Peace River	.....	.....	.....	.....
Central District (No. 3)				
Nicola	1,595	928	41,945	22,228
Vernon	.....	.....	.....	.....
Yale	.....	.....	1,038	550
Ashcroft	.....	.....	.....	.....
Kamloops	320	186	356	189
Lillooet	1,400	814	670	355
Clinton	.....	.....	.....	.....
Southern District (No. 4)—				
Grand Forks	1,059	616	.....	.....
Greenwood	386,957	225,116	444,429	235,516
Osoyoos	3,148	1,831	226	120
Similkameen	150,757	87,705	167,040	88,520
Eastern District (No. 5)				
Fort Steele	5,505,555	3,255,276	5,055,996	2,679,324
Windermere	19,023	11,067	2,663	1,411
Golden	.....	.....	1,466	777
Ainsworth	102,654	59,720	92,323	48,925
Slocan	1,117,993	650,404	958,294	507,829
Slocan City	13,906	8,099	3,252	1,723
Nelson	43,357	25,223	26,868	14,238
Arrow Lake	.....	.....	.....	.....
Trail Creek	7,425	4,325	393	208
Revelstoke	1,898	1,052	466	247
Trout Lake	633	368	.....	.....
Lardeau	5	3	529	280
Western District (No. 6)—				
Nanaimo	128	74	216	114
Alberni	.....	.....	41	22
Clayoquot	.....	.....	.....	.....
Quatsino	.....	.....	.....	.....
Victoria	.....	.....	.....	.....
New Westminster	.....	.....	.....	.....
Vancouver	192,228	111,831	199,544	105,744
Total	**10,627,167**	**6,182,461**	**9,918,800**	**5,256,270**

Table 96.—Imports into Canada and Exports of Silver, 1927-1929

—	1927		1928		1929	
	Fine ounces	$	Fine ounces	$	Fine ounces	$
IMPORTS—						
Silver in bars, blocks, ingots, drops, sheets or plates unmanufactured	.....	896,535	.....	984,547	.....	958,312
Silver, manufactures of, n.o.p.	.....	344,021	.....	350,567	.....	400,125
Silver coin	.....	410	.....	.....	.....	.....
Total	.....	**1,240,966**	.....	**1,335,114**	.....	**1,358,437**
EXPORTS—						
Silver contained in ore, concentrates, etc.	5,445,117	2,894,386	6,815,691	3,824,385	7,058,275	3,736,204
Silver bullion	15,970,961	8,995,040	14,805,993	8,579,968	14,879,770	8,022,917
Silver coin	.....	.....	.....	.....	.....	83
Total	**21,416,078**	**11,889,426**	**21,621,684**	**12,404,353**	**21,938,045**	**11,759,204**

Table 97.—Monthly Average Prices of Silver, 1927-1929

(From the *Engineering and Mining World*)

Month	New York (Cents per fine ounce)			London (Pence per standard ounce)		
	1927	1928	1929	1927	1928	1929
January	55·795	57·135	57·019	25·863	26·313	26·257
February	57·808	57·016	56·210	26·854	26·205	25·904
March	55·306	57·245	56·346	25·655	26·329	26·000
April	56·399	57·365	55·668	26·136	26·409	25·738
May	56·280	60·298	54·125	26·072	27·651	25·084
June	56·769	60·019	52·415	26·203	27·459	24·258
July	56·360	59·215	52·510	25·983	27·262	24·289
August	54·718	58·889	52·579	25·224	27·096	24·288
September	55·445	57·536	51·042	25·565	26·440	23·708
October	56·035	58·087	49·913	25·776	26·727	23·042
November	57·474	57·954	49·615	26·526	26·704	22·690
December	57·957	57·335	48·475	26·701	26·362	22·258
Average	**56·370**	**58·176**	**52·993**	**26·047**	**26·747**	**24·460**

World Production.—In order of importance, the chief silver producing countries of the world are: Mexico, the United States, Canada and Peru. This places Canada third in the countries of the world and first in the British Empire.

North America produced 192,024,261 ounces in 1929 out of a total world's production of 261,228,824. South America's output was 28,563,000 ounces; Europe, 11,393,702 ounces, of which 5,465,000 ounces were produced in Germany and 2,500,000 ounces in Spain and Portugal. Oceania was credited with 10,500,000 ounces and the continent of Asia with 14,694,600 ounces while Africa, the greatest gold producing continent of the world, produced only 1,253,261 ounces of silver.

Table 98.—Comparative Figures of Silver Production, for the World, Mexico, United States, Peru and Canada, 1898-1929

Year	World's Output*	Mexico's Output*	United States Output*	Peru's Output*	Canada's Output
	Fine ounces	Fine ounces	Fine ounces	Fine ounces	Fine ounces
1898	165,295,572	56,738,000	54,438,000	1,951,240	4,452,333
1899	168,337,453	55,612,090	54,764,500	6,525,245	3,411,644
1900	173,591,364	57,437,808	57,647,000	7,295,825	4,468,225
1901	174,998,573	57,656,549	55,214,000	5,600,848	5,539,192
1902	162,763,483	60,176,604	55,500,000	4,264,528	4,291,317
1903	167,937,894	70,499,942	54,300,000	1,746,674	3,198,581
1904	168,390,238	60,808,978	57,682,800	3,008,705	3,577,526
1905	172,317,688	65,040,865	56,101,600	8,156,044	6,000,023
1906	165,054,497	55,225,268	56,517,900	7,404,238	8,473,379
1907	184,206,984	61,147,203	56,514,700	9,566,118	12,779,799
1908	203,236,861	73,664,027	52,440,800	9,566,118	22,106,233
1909	211,215,633	73,942,432	54,721,500	9,566,118	27,529,473
1910	221,715,673	71,372,194	57,137,900	6,626,930	32,869,264
1911	226,192,923	79,032,440	60,399,400	8,351,563	32,559,044

Table 98.—Comparative Figures of Silver Production for the World, Mexico, United States, Peru and Canada, 1898-1929—Concluded

Year	World's Output*	Mexico's Output*	United States Output*	Peru's Output*	Canada's Output
1912	224,310,654	74,640,300	63,766,800	8,351,563	31,955,560
1913	223,907,843	70,703,828	66,801,500	8,351,563	31,845,803
1914	160,669,129	27,546,752	72,455,100	9,214,190	28,449,821
1915	177,978,455	39,570,151	74,061,075	9,419,950	26,625,060
1916	156,626,521	22,838,385	74,414,802	9,419,950	25,459,741
1917	174,187,800	35,000,000	71,740,400	10,864,400	22,221,274
1918	198,168,408	62,517,000	67,810,100	9,781,734	21,383,979
1919	176,459,609	65,934,224	56,682,445	9,821,729	16,020,657
1920	174,212,686	66,662,253	55,361,573	9,196,282	13,330,357
1921	171,285,542	64,465,347	53,052,441	10,008,553	13,543,198
1922	209,815,448	81,076,899	56,212,054	13,169,765	18,626,439
1923	246,009,534	90,859,083	73,295,810	18,654,703	18,001,744
1924	239,484,703	91,486,136	65,366,840	18,717,087	19,736,323
1925	245,213,993	92,885,465	66,106,922	19,817,439	20,228,988
1926	253,795,166	98,291,166	62,672,953	21,499,798	22,371,924
1927	251,096,555	104,573,919	60,394,199	18,295,408	22,736,698
1928	257,925,154	108,537,307	58,426,004	21,607,693	21,936,407
1929	261,715,021	108,700,372	61,233,321	21,495,169	23,143,261

*From Annual report of the "Director of the Mint", Washington.

LEAD

Canada

Canada's lead production includes (a) lead contained in ores exported less deductions for smelter losses valued at the average price in London for the year; (b) the lead contained in the base bullion made by the Consolidated Mining and Smelting Co., Ltd., valued at the average price in London for the year, and (c) the pig lead made by the Kingdon Mining, Smelting and Manufacturing Co. at Galetta, Ontario, at its *sales* value.

Production in 1929 included lead from the Sullivan mine in East Kootenay, B.C., and from many smaller mines in the Slocan District; from the Mayo district of the Yukon Territory; from the Galetta mine in Ontario as well as from some lead concentrates shipped from the Chelmsford District of Ontario; and from the Tetreault mine of Notre Dame des Anges, Portneuf county, Quebec.

Previous to 1904, lead ores mined in Canada were either exported as ore or smelted in Canadian furnaces to a base bullion which was then exported for refining. A lead refinery employing the Betts electrolytic process has been in operation at Trail, B.C., since 1904 treating the product from lead blast furnaces.

A decrease in 1929 of 11,424,122 pounds from the Canadian lead production of the previous year was more than compensated for by an increase in valuation of $991,017, due to higher lead prices. Important quantities of lead are consumed in the storage battery, cable, and pigment industries. Keen competition in the latter field has been displayed recently owing to the introduction of other metals as paint and enamel ingredients. New uses of lead include the making of ethyl gasoline and the lead cushioning of sky scraper foundations.

Table 99.—Production of Lead in Canada, 1928 and 1929

Province	1928		1929	
	Pounds	Value	Pounds	Value
		$		$
Quebec	6,218,336	284,520	5,358,304	270,616
Ontario	6,814,757	402,289	4,769,506	294,431
British Columbia	317,722,146	14,537,377	307,999,153	15,555,189
Yukon	7,191,449	329,045	8,395,603	424,012
Total	**337,946,68**	**15,553,231**	**326,522,566**	**16,544,248**

Table 100.—Production* of Lead from Canadian Ores, 1887-1929

Year	Pounds	Value	Year	Pounds	Value
		$			$
1887	204,800	9,216	1909	45,857,424	1,692,139
1888	674,500	29,812	1910	32,987,508	1,216,249
1889	165,100	6,488			
1890	105,000	4,704	1911	23,784,960	827,717
			1912	35,763,476	1,597,554
1891	88,665	3,857	1913	37,662,703	1,754,705
1892	808,420	33,064	1914	36,337,765	1,627,568
1893	2,135,023	79,636	1915	46,316,450	2,593,721
1894	5,703,222	187,636			
1895	16,461,794	531,716	1916	41,497,615	3,532,692
			1917	32,576,281	3,628,020
1896	24,199,977	721,159	1918	51,398,002	4,754,315
1897	39,018,219	1,396,853	1919	43,827,699	3,053,637
1898	31,915,319	1,206,399	1920	35,953,717	3,214,262
1899	21,862,436	977,250			
1900	63,169,821	2,760,521	1921	66,679,592	3,828,742
			1922	93,307,171	5,817,702
1901	51,900,958	2,249,387	1923	111,234,466	7,985,522
1902	22,956,381	934,095	1924	175,485,499	14,221,345
1903	18,139,283	768,562	1925	253,590,578	23,127,460
1904	37,531,244	1,617,221			
1905	56,864,915	2,676,632	1926	283,801,265	19,240,661
			1927	311,423,161	16,477,139
1906	54,608,217	3,089,187	1928	337,946,688	15,553,231
1907	47,738,703	2,542,086	1929	326,522,566	16,544,248
1908	43,195,733	1,814,221			
			Total	**2,963,102,325**	**175,927,731**

*Previous to 1913 the figures reported show the metal content of the shipments and are somewhat in excess of the actual amount recovered. Since 1912 the data given represent the quantity of lead produced in Canada from domestic ores, together with the estimated lead recovery from lead ores and concentrates exported.

Table 101.—Production of Lead from Canadian Ores, by Provinces, 1920-1929

(For years 1887 to 1919 see 1928 report on the Mineral Production of Canada)

Year	Quebec		Ontario		British Columbia		Yukon	
	Pounds	Value $	Pounds	Value $	Pounds	Value $	Pounds	Value $
1920	905,472	80,949	2,255,520	201,643	32,792,725	2,931,670	.....	.....
1921	595,881	34,215	3,312,493	190,203	60,298,603	3,462,346	2,472,615	141,978
1922	.....	.....	2,890,397	180,216	87,093,266	5,430,265	3,323,508	207,221
1923	520,041	37,334	4,401,494	315,983	99,541,818	7,146,107	6,771,113	486,098
1924	1,058,983	85,820	5,055,368	409,687	168,467,628	13,652,617	903,520	73,221
1925	2,051,100	187,050	7,209,534	657,510	242,454,502	22,111,850	1,875,442	171,040
1926	3,729,636	251,788	7,398,795	580,730	266,812,461	18,012,509	5,860,373	395,634
1927	6,496,577	341,461	7,990,709	528,729	292,770,544	15,388,020	4,165,331	218,929
1928	6,218,336	281,520	6,814,757	402,289	317,722,416	14,517,377	7,191,419	329,045
1929	5,358,304	270,616	4,769,506	294,431	307,999,153	15,555,189	8,395,603	424,012

Table 102.—Refined Lead Produced in Canada,* 1904-1929

Year	Pounds of refined lead produced	Year	Pounds of refined lead produced	Year	Pounds of refined lead produced
1904	7,519,440	1913	37,923,043	1922	81,412,716
1905	15,804,509	1914	36,443,706	1923	101,096,312
1906	20,471,314	1915	43,518,618	1924	130,471,208
1907	26,607,461	1916	33,087,474	1925	213,217,603
1908	36,549,274	1917	32,115,114	1926	257,273,585
1909	41,883,614	1918	31,571,112	1927	295,766,327
1910	32,987,508	1919	34,330,920	1928	301,067,819
				1929	304,449,673
1911	23,525,050	1920	28,720,030		
1912	35,893,190	1921	60,949,793	**Total**	**2,264,656,415**

* Includes the electrolytic lead produced from Canadian and foreign ores at Trail, B.C., and also the pig lead from Galetta, Ont.

Table 103.—Imports into Canada and Exports of Lead, 1927-1929

	1927		1928		1929	
	Quantity	Value	Quantity	Value	Quantity	Value
	Pounds	$	Pounds	$	Pounds	$
IMPORTS—						
Old and scrap, pig and block	405,127	33,165	531,404	31,141	1,173,481	68,787
Bars and sheets	112,039	8,903	161,970	10,742	260,862	16,437
Litharge	3,015,000	245,630	3,977,300	279,136	5,592,200	423,261
Acetate and nitrate of lead	337,014	28,218	261,768	21,382	415,596	32,452
Other manufactures	-	344,053	-	342,349	.....	293,629
Pipe lead	109,299	8,456	184,754	13,648	62,874	5,138
Shots and bullets	14,120	1,514	14,158	1,408	13,434	1,474
Tea lead	59,808	5,936	34,659	3,022	13,480	1,350
Lead pigments—						
Dry white lead	338,399	24,879	289,001	21,761	67,585	6,297
White lead, ground in oil	360,301	28,252	492,497	39,211	236,093	19,538
Dry red lead and orange mineral	1,844,288	125,358	1,469,943	100,733	1,791,872	134,685
Total	-	**854,367**	-	**864,533**	.....	**1,003,048**
EXPORTS—						
Lead in ore	13,032,600	844,637	14,962,900	893,709	15,976,800	1,047,441
Pig lead	239,409,100	11,981,388	255,421,700	10,172,075	228,374,100	10,053,402
Total	**252,441,700**	**12,826,025**	**270,384,600**	**11,065,784**	**244,350,900**	**11,100,843**

Table 104.—Monthly Average Prices of Pig Lead, Montreal,* New York and London,† 1927-1929

Month	Montreal (Value in cents per pound)			New York (Value in cents per pound)			London‡ (Value in pounds sterling per long ton)		
	1927	1928	1929	1927	1928	1929	1927	1928	1929
January	7·52	6·40	6·43	7·577	6·500	6·650	27·485	21·773	22·111
February	7·48	6·11	6·58	7·420	6·329	6·853	27·344	20·283	23·128
March	7·62	5·96	7·17	7·577	6·000	7·450	27·845	19·938	25·409
April	7·22	5·90	7·08	7·126	6·100	7·187	26·546	20·306	24·783
May	6·82	5·84	6·74	6·616	6·123	7·000	25·654	20·483	23·949
June	6·65	5·91	6·70	6·411	6·300	7·000	24·438	20·985	23·694
July	6·45	5·83	6·55	6·344	6·220	6·894	23·491	20·602	22·810
August	6·40	5·98	6·60	6·681	6·248	6·750	23·119	21·674	23·185
September	6·07	6·11	6·67	6·207	6·450	6·890	21·446	22·050	23·557
October	5·87	6·14	6·62	6·250	6·500	6·873	20·479	22·082	23·226
November	6·06	6·21	6·48	6·259	6·389	6·285	20·889	21·239	21·622
December	6·43	6·27	6·50	6·504	6·495	6·250	22·163	21·342	21·472
Average	**6·79**	**6·06**	**6·67**	**6·755**	**6·305**	**6·833**	**24·192**	**21·060**	**23·246**

*Producers' prices for car load quantities ex-cars Montreal, as furnished by the Consolidated Mining and Smelting Company.

†From the *Engineering and Mining World*.

‡Computed at par ($4·8666), the London price of lead in 1927—5·250 cents per pound; in 1928—4·575 cents per pound; and in 1929—5·050 cents per pound.

Table 105.—World Production of Lead, 1925-1929

(From the *Year Book of the American Bureau of Metal Statistics* 1929).

(Short tons)

Country	1925	1926	1927	1928	1929
United States	662,500	696,000	673,000	649,800	588,000
Canada (a)	126,795	141,900	155,711	108,973	163,261
Mexico	205,159	220,879	274,025	260,675	274,232
Total North America	994,454	1,058,779	1,102,736	1,079,448	1,125,493
Argentina	8,488	9,370	8,598	9,305	10,408
Peru (b)	(c)	(c)	3,601	16,070	21,595
Other South America (b)	4,700	10,100	2,500	1,000	2,500
Total South America	13,188	19,470	14,699	26,375	34,503

Table 105.—World Production of Lead, 1925-1929—Continued

(From the *Year Book of the American Bureau of Metal Statistics*, 1929).

(Short tons)

Country	1925	1926	1927	1928	1929
Austria	5,961	7,141	8,913	8,967	7,341
Belgium	72,278	68,080	72,906	68,982	68,577
Czechoslovakia	2,426	2,537	2,677	3,231	3,307
France	22,641	21,495	27,528	25,255	22,597
Germany	77,712	84,436	92,593	95,900	107,915
Great Britain	5,303	4,777	6,759	9,522	11,948
Poland	30,146	30,648	31,839	40,094	39,451
Greece	5,914	5,622	5,291	7,937	9,370
Italy	26,979	26,003	26,206	23,435	24,984
Jugoslavia	12,070	10,812	11,764	11,314	9,921
Russia	1,067	1,479	1,341	3,307	8,818
Spain	152,338	162,470	153,278	135,652	146,894
Sweden	901	621	457	18	.....
Total Europe	415,736	426,121	441,552	433,614	461,023
Turkey	5,276	6,629	8,655	7,674	7,164
India (Burma)	52,945	60,849	73,883	87,790	89,860
Japan	3,678	3,978	3,741	4,027	3,748
Total Asia	61,899	71,456	86,279	99,491	100,772
Australia	165,634	170,412	184,710	174,857	194,746
Rhodesia	3,674	4,292	6,561	5,230	1,831
Tunis	15,070	20,262	20,571	19,672	20,832
Total Africa	18,744	24,554	27,132	24,902	22,663
Grand Totals	**1,669,655**	**1,770,792**	**1,857,108**	**1,838,687**	**1,939,200**

(a) Dominion Bureau of Statistics final figures.

(b) Does not include lead produced from South American ore exported to European countries, principally Belgium and Germany.

(c) Included in "Other South America."

(d) The statistics of lead production in Polish Silesia have been changed so that they are now given in terms of base bullion, which conforms to the practice in respect of most of the other countries. This change has been made retrospectively beginning 1922.

ZINC

Refined zinc is produced at Trail, B.C., from the silver-lead-zinc ores of the West Kootenay district and from the Sullivan mine at Kimberley, B.C. Zinc concentrates are exported to Belgium, and France from the Tetreault silver-lead-zinc property in Quebec. The Treadwell Yukon Mining Co., Ltd. made shipments of zinc concentrates from its property in the Sudbury district, near Chelmsford, Ontario.

Figures for the Canadian total production of zinc are made up by adding the production of refined zinc at Trail to the amount of zinc estimated as recoverable from ores exported; the value of production is calculated at the monthly average price for zinc on the London market for the year, exchange conversion being made at par. Previous to 1926, the average price on the St. Louis market was used, but as the bulk of Canada's zinc output is exported and sold on the basis of London quotations, it was thought that a more accurate aggregate value would be obtained by using prices quoted in London, and in 1926 this change in practice was made. It may be noted that the present procedure is in conformity with the practice of the British Columbia Department of Mines.

Zinc production in Canada for 1929 showed an increase of 6·8 per cent over that of the previous year. Active and extensive development of sulphide deposits containing both massive and disseminated copper-zinc ore occured in the provinces of Manitoba, Ontario and Quebec, portending an increased Canadian zinc output in the near future. In Nova Scotia the British Metals Corporation Ltd., continued operations at the Sterling lead-zinc mine. Recent research has led to the utilization of large quantities of zinc in die casting, especially in the motor and hardware industries.

Table 106.—Production of Zinc in Canada, 1928 and 1929

Province	1928		1929	
	Pounds	Value	Pounds	Value
		$		$
Quebec	21,057,760	1,156,745	19,653,440	1,058,731
Ontario	58,721	3,226	5,516,806	297,190
British Columbia	163,530,893	8,983,079	172,096,841	9,270,857
Total	**184,647,374**	**10,143,050**	**197,267,087**	**10,626,778**

Table 107.—Production of Zinc from Canadian Ores, 1920-1929

(For years 1898 to 1919 see 1928 report on the Mineral Production of Canada)

Year	Quantity	Value	Year	Quantity	Value
		$			
1920	39,863,912	3,057,961	1925	109,268,511	8,328,446
1921	53,089,356	2,471,310	1926	149,938,105	11,110,413
1922	56,290,000	3,217,536	1927	165,495,525	10,250,793
1923	60,416,240	3,991,701	1928	184,647,374	10,143,050
1924	98,909,077	6,274,791	1929	197,267,087	10,626,778

Table 108.—Production of Zinc from Canadian Ores, by Provinces, 1920-1929

(For years 1898 to 1919 see 1928 report on the Mineral Production of Canada)

Year	Quebec		Ontario		Alberta		British Columbia	
	Quantity	Value $	Quantity	Value $	Quantity	Value $	Quantity	Value $
1920	1,120,200	85,931	13,950	1,070	.....	.....	38,729,762	2,970,960
1921	.....	.....	.....	.....	.....	.....	53,089,356	2,471,310
1922	.....	.....	.....	.....	.....	.....	56,290,000	3,217,536
1923	366,240	24,197	.....	.....	.....	.....	60,050,000	3,967,504
1924	2,900,008	184,547	.....	.....	.....	.....	96,000,069	6,090,244
1925	9,936,000	757,322	179,545	13,685	.....	.....	99,152,966	7,557,439
1926	12,904,176	956,199	.....	.....	.....	.....	137,033,929	10,154,214
1927	17,189,046	1,064,690	.....	.....	.....	.....	148,306,479	9,186,103
1928	21,057,760	1,156,745	58,724	3,226	.....	.....	163,530,893	8,983,079
1929	19,653,440	1,058,731	5,516,806	297,190	.....	.....	172,096,841	9,270,857

Table 109.—Production of Refined Zinc at Trail, B.C., 1916-1929

Year	Short tons	Year	Short tons
1916	2,974	1923	30,025
1917	9,985	1924	27,444
1918	12,574	1925	38,462
1919	12,326		
1920	18,517	1926	61,727
		1927	73,208
1921	26,494	1928	81,765
1922	28,145	1929	86,048

Table 110.—Imports into Canada and Exports of Zinc and Brass, 1927-1929

—	1927		1928		1929	
	Pounds	Value	Pounds	Value	Pounds	Value
IMPORTS		$		$		$
Zinc and Zinc Products—						
Zinc, in blocks, pigs and sheets	5,911,727	512,389	9,299,015	687,293	10,631,343	787,432
Zinc, as spelter	1,355,816	89,233	1,845,258	107,920	2,658,483	165,[illegible]
Zinc white (80% Zn.)	10,665,713	1,113,573	18,128,357	1,166,491	19,052,472	1,248,[illegible]
Zinc dust	339,055	34,110	458,923	41,906	483,192	38,[illegible]
Zinc, sulphate and chloride of (44% Zn.)	2,032,015	86,149	2,530,141	98,501	3,123,840	125,[illegible]
Zinc, manufactures of	.....	277,236	.....	169,071	.....	167,[illegible]
Lithopone	15,804,451	644,175	16,287,182	717,207	19,408,436	852,[illegible]
Total	.....	**2,756,865**	.....	**2,991,389**	.....	**3,386,173**
Brass and Brass Products—						
Brass, in blocks, pigs and ingots (30% Zn.)	819,500	99,956	1,175,200	153,488	1,008,500	165,444
Brass, old and scrap (30% Zn.)	2,908,500	270,627	3,395,700	556,000	4,780,200	617,492
Brass, tubing (30% Zn.)	2,765,078	627,124	3,322,210	748,869	4,074,669	1,020,931
Brass, plain wire (30% Zn.)	453,239	113,668	393,204	98,658	471,797	138,000
Brass, bars and rods	652,300	114,270	773,200	142,150	1,021,700	202,910
Brass, strips, sheets or plates	784,700	158,742	1,416,500	264,551	1,105,300	265,925
Brass, wire cloth, n.o.p.	.....	48,030	.....	53,463	.....	63,895
Brass, cup for manufacture of shells	.....	96,773	.....	157,274	.....	173,609
Brass, caps for electric batteries	.....	10,373	.....	11,710	.....	11,137
Brass, hand-pumps	.....	25,479	.....	28,511	.....	31,287
Brass, nails, tacks, etc.	.....	3,057	.....	5,214	.....	8,645
Brass and copper rivets, burrs and washers	.....	85,576	.....	87,659	.....	227,652
Brass valves	.....	307,753	.....	401,823	.....	571,551
Brass, other manufactures, n.o.p.	.....	3,089,060	.....	3,660,436	.....	4,004,585
Carburettors of brass	.....	39,444	.....	35,015	.....	43,790
Tubing, brass or copper, not more than ¼-inch in diameter, in lengths not less than 6 feet, coated with metal, and not polished, bent or otherwise manufactured	5,335	1,173	2,043	383	49	14
Total	.....	**5,097,105**	.....	**6,205,205**	.....	**7,546,867**
EXPORTS						
Zinc—In Ore	.....	.....	22,510,000	1,438,619	25,738,900	1,415,725
Ore	50,454,000	862,498	.....	.....	.....	.....
Spelter	112,420,400	6,826,808	127,188,500	6,602,867	135,085,700	7,031,645
Scrap, dross and ashes	5,877,100	178,562	6,934,000	203,884	7,638,200	262,719
Total	.....	**7,867,868**	.....	**8,245,370**	.....	**8,710,089**
Brass—						
Old and scrap	7,296,400	584,723	11,548,200	981,071	11,918,500	1,206,510
Rods, sheets and tubing	47,300	10,054	49,600	9,385	66,900	15,910
Valves	.....	248,385	.....	261,419	.....	282,429
Mfrs. of brass, n.o.p.	.....	505,848	.....	594,159	.....	892,850
Total	.....	**1,349,012**	.....	**1,849,034**	.....	**2,397,699**

Table 111.—Monthly Average Prices of Zinc at Montreal, St. Louis and London, 1927-1929

Month	Montreal[1] (In cents per pound)			St. Louis[2] (In cents per pound)			London[2] (In pounds Sterling per long ton)		
	1927	1928	1929	1927	1928	1929	1927	1928	1929
January	8·18	7·10	7·29	6·661	5·643	6·350	30·979	26·125	26·196
February	8·17	7·00	7·30	6·673	5·551	6·350	29·931	25·518	26·247
March	8·16	7·08	7·37	6·692	5·624	6·463	30·649	25·082	27·050
April	7·80	7·21	7·23	6·338	5·759	6·658	29·579	25·493	26·759
May	7·53	7·39	7·05	6·075	6·026	6·618	29·034	26·192	26·727
June	7·68	7·35	7·00	6·213	6·158	6·686	28·598	25·664	26·216
July	7·66	7·23	6·94	6·229	6·201	6·706	28·280	24·946	25·332
August	7·80	7·15	6·85	6·342	6·249	6·800	28·210	24·549	24·896
September	7·67	6·97	6·74	6·212	6·250	6·799	27·347	24·497	24·208
October	7·46	6·91	6·50	5·996	6·250	6·740	26·899	24·030	22·927
November	7·20	6·99	6·15	5·745	6·263	6·242	26·281	24·891	20·851
December	7·18	7·30	6·00	5·722	6·349	5·666	26·363	26·609	20·103
Average	**7·71**	**7·14**	**6·87**	**6·242**	**6·027**	**6·512**	**28·513**	**25·284**	**24·793**

[1]Supplied by Consolidated Mining and Smelting Co., Montreal, P.Q.
[2]From the *Engineering and Mining World*.
Converted at par, the average London quotations in cents per pound: in 1927 were 6·194 cents, in 1928 were 5·493 cents, and in 1929 were 5·387 cents per pound.

Table 112.—World Production of Zinc, (a) 1925-1929

(From the *Year Book of the American Bureau of Metal Statistics*)

(Short tons)

Country	1925	1926	1927	1928	1929
United States	590,928	638,533	613,548	617,613	638,849
Mexico	1,406	6,550	7,089	12,368	16,643
Canada (c)	54,634	74,969	82,748	92,324	98,634
Belgium	188,339	208,078	219,457	227,404	220,316
Czechoslovakia	3,307	3,074	5,421	9,103	13,691
France	74,693	80,969	92,161	106,783	100,984
Germany	64,620	75,361	92,706	108,136	112,185
Great Britain	42,726	20,148	46,893	62,043	65,294
Italy	7,141	8,417	8,121	11,744	17,206
Jugoslavia	2,460	2,619	3,511	4,762	8,061
Netherlands	23,277	27,333	28,955	29,635	28,342
Norway	7,503	5,907	6,049	.....	5,069
Poland (b)	126,038	136,393	165,755	178,269	186,324
Russia	1,653	2,059	2,498	4,740	4,853
Spain	16,609	17,707	18,222	14,035	13,030
Sweden	5,233	5,291	5,160	5,629	5,201
Australia	51,280	52,942	54,438	55,010	56,001
Japan	18,684	18,708	19,288	21,086	25,353
French Indo-China	1,276	1,396	1,291	3,182	4,196
Rhodesia	.....	.....	.....	10,730	13,575
Totals	**1,281,867**	**1,386,454**	**1,473,311**	**1,575,496**	**1,633,867**

(a) Slab zinc produced in the several countries, unallocated according to the origin of the ore.
(b) Under the head of Poland has been included the production of Upper Silesia and Galicia, when those provinces belonged to Germany and Austria, respectively.
(c) Dominion Bureau of Statistics final figures.

CHAPTER FOUR

THE NICKEL-COPPER INDUSTRY IN CANADA

Including Commodity Statistics Tables on Nickel, Copper, and Metals of the Platinum Group

1. General Review.
2. Commodity statistics including tables showing production by provinces, imports, exports, prices and world output of nickel, copper and metals of the platinum group.

I. General Review

(a) *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 operations are carried on in close proximity to the mines, and refining is done at Port Colborne in Ontario, while some of the matte is exported for treatment in plants at Clydach, Wales and Huntingdon, Va.

As thus defined, the industry in Canada constitutes the source of nickel, most of the production of the platinum group metals, and one of the principal sources of copper.

Another industry, the copper-gold-silver mining group also produces a large part of the Dominion output of copper, but as the ores of this group, in the aggregate, contain about 5 per cent of the gold produced each year from Canadian mines, the activities of the copper-gold mines are reviewed in the chapter on the gold mining industry. Production and trade statistics on nickel, copper and the metals of the platinum group are given in this chapter.

(b) *Historical.*—Construction of railways in Canada has lead, in several instances, to the discovery of valuable mineral deposits as for example, the finding of the nickel-copper ore bodies in the Sudbury area when the Canadian Pacific Railway was being built in 1883. The first of these was worked in 1886 primarily for copper, the presence of nickel not being detected until 1887. About this time the use of nickel in the manufacture of nickel steel was introduced and the resulting demand for nickel made possible the successful development of the great industry that has now become so firmly established. Nickel steel was made in large quantities for armament purposes, and nickel production reached its peak during the great war. After hostilities ceased, the demand for nickel was considerably reduced and the nickel industry was depressed. Since that time, by intensive research, new uses have been found for this metal and production in 1929 far exceeded any previous output.

(c) *Importance of Nickel, Copper and Platinum Group Metals.*—About 90 per cent of the world's supply of nickel is derived from Canadian ores, the remainder being obtained in New Caledonia and Norway. A small amount of nickel is found in the silver-cobalt ores of the Cobalt district, but most of the tonnage is produced from the ores of the Sudbury area.

Copper produced from the nickel-copper ores in Ontario constitutes about 41 per cent of the total copper obtained from all Canadian ores. British Columbia, mining and smelting copper ores and copper-gold ores, produces more than 42 per cent of Canada's copper output. Quebec supplies the remainder.

As a world producer of copper, Canada ranks fourth, contributing about 6 per cent of the world's output annually. The amount of refined copper produced in Canada is relatively small, heretofore it has usually been found more profitable to ship blister copper or copper in matte or in concentrates, to smelters in other countries where the demand for refined copper is greater than in Canada. Improvement in the Canadian demand for the refined metal may be expected as a phase of the industrial expansion now being observed, and the output of refined copper from Canadian plants, should increase proportionately unless other untoward features of the market arise to check this progress.

Some gold and silver as well as metals of the platinum group, including, besides platinum, the related metals, palladium, rhodium, osmium and iridium, are present in varying amounts in the different ores of the Sudbury district. Some of these ores are richer than others in precious metals, and the recovery of platinum group metals, therefore, has been a feature of the work done by the great nickel companies.

At the present time, Canada produces about 5 per cent of the world's supply of platinum, but recovery of much of this metal is carried out in refineries operating outside the confines of the Dominion.

Interest in the development work carried on by the same companies operating nickel-copper properties in the Sudbury area increased during 1929. The International Nickel Company of Canada, Limited, continued to operate the Creighton mine and the smelter at Coppercliff and to produce refined and electrolytic nickel, nickel oxides and salts, and blister or converter copper in the refinery at Port Colborne, Ontario. Development of the Frood mine added greatly to the company's reserves. The same Company, operating the Garson and Levack mines and the smelter at Coniston, Ontario worked steadily throughout the year producing matte for shipment to their refinery at Clydach, Wales, and utilized the bessemer gases for the manufacture of high-grade sulphuric acid for which a splendid market has been established. Low production costs enable the company to make very favourable contracts with large users of acid.

(d) *Mining.*—The ore in the Sudbury district averages from 2 to 4 per cent of nickel and from 1 to 3 per cent of copper, and is usually a mixture of the sulphides of copper, nickel and iron in the form of pyrrhotite, pentlandite and chalcopyrite associated with and genetically related to norite, a basic intrusive rock. Open-pit methods of mining were first used, but later, underground workings were adopted. Shafts are sunk and haulage ways are driven into a solid foot wall, the ore being intersected at intervals by cross cuts. The ore is usually hoisted to rock houses where it is crushed and hand-sorted; the high-grade material is suitable for direct smelting. All ore from the nickel mines cannot be hand-sorted satisfactorily, often the precious and other metal-bearing minerals are finely disseminated through the ore zone, so that crushing and concentration of the product from the mine are necessary before smelting can be undertaken with satisfactory results.

(e) *Smelting and Refining.*—Practice in the preparation of the ore for smelting varies. The International Nickel Company heap-roasts the coarse ore before smelting at Coppercliff, and at Coniston roasts only the fines and flue dust on Dwight-Lloyd sintering machines. Both plants smelt in water-jacketed furnaces, producing a slag which is sent to the dump, and a matte which contains 15 to 25 per cent of copper-nickel in addition to sulphur. This low-grade matte is transferred to a basic converter where practically all of the iron and part of the sulphur are eliminated. The product of these converters, bessemer matte, contains about 80 per cent copper-nickel; 19·5 per cent sulphur; 0·5 per cent iron; this product is shipped to the refineries for further treatment.

The International Nickel Company ships some matte to the Port Colborne refinery, where the products are converter copper, containing some gold and silver; electrolytic nickel; refined nickel and nickel oxide; and residues containing palladium and platinum. This company exports the remainder of the matte produced at the smelter to Huntingdon, West Virginia, U.S.A., for manufacture into monel metal, an alloy of copper and nickel in which the constituents are present in about the same proportions in which they occur in the ore and are not separated during refining process.

Smelter matte is also shipped to the company's refinery at Clydach, Wales, for reduction. The refinery produces nickel metal of very high purity that finds many uses in the metallurgical field, also copper sulphate, chiefly for use as an insecticide. Much of the nickel from the plant near Clydach, Wales, is shipped to foreign plants for use in the manufacture of nickel alloys.

A considerable market has been built up for these alloys due to their resistance to corrosion. Chemical works, creameries, and other plants of a similar nature, are gradually increasing their uses for nickel and its alloys.

Activity and expansion in the nickel mining industry at Sudbury was especially pronounced in 1929 and included the construction by the International Nickel Company of a 5,000 ton smelter and an 8,000 ton concentrator at Coppercliff.

Erection of a new electrotylic copper refinery with a monthly capacity of 10,000 tons of refined copper was commenced at Coppercliff. This metallurgical development is shared by the International Nickel Company, Consolidated Mining and Smelting Company, and the American Metal Company of New York.

Progress was rapid in both mine development and surface construction at the property of the Falconbridge Nickel Mines, Ltd., the new 250 ton smelter of this company is expected to operate early in 1930.

The annual report of the International Nickel Company gives proven ore reserves at 202,620,000 short tons, of which those of the famous Frood deposit contribute 134,673,000 tons. Over 10,000,000 tons of high grade ore were added to the reserves of this mine from development completed in the lower levels during 1929.

Table 113.—Capital Employed in the Nickel-Copper Industry in Canada, 1928 and 1929

—	1928	1929
	$	$
Capital employed as represented by—		
Cost of lands, buildings, plant, machinery and tools—		
Mines	45,106,028	16,698,121
Smelters and refinery	20,199,878	34,902,103
Cost of materials and supplies on hand	5,075,811	7,803,673
Cash, trading and operating accounts and bills receivable	6,223,842	4,129,182
Total	**76,695,559**	**63,533,079**

Table 114.—Output from Nickel-Copper Mines and Smelters in Canada, 1928 and 1929

—		1928	1929
Ore mined	tons	1,457,910	1,991,910
Ore shipped	tons	1,457,910	1,991,910
Content of ores, etc., shipped:—			
Copper	lb.	67,485,937	103,457,449
Nickel	lb.	100,420,842	128,901,304
Ores and concentrates treated at smelters	tons	1,476,704	2,033,457
Matte produced	tons	91,313	132,030
Content of matte:—			
Copper	lb.	59,408,538	92,630,143
Nickel	lb.	86,786,810	116,190,232
Matte shipped to Canadian refineries	tons	66,463	115,599
Matte exported to Foreign smelters	tons	39,310	25,086

Table 115.—Proportion of Nickel and Copper in Sudbury Matte, 1912-1929

Year	Percentage		
	Nickel	Copper	Total
1912	53·5	26·3	79·8
1913	52·7	27·4	80·1
1914	49·0	31·1	80·1
1915	50·3	29·0	79·3
1916	51·6	28·0	79·6
1917	50·6	26·9	77·5
1918	52·6	26·0	78·6
1919	51·6	28·3	79·9
1920	52·7	27·6	80·3
1921	49·4	32·4	81·8
1922	50·1	31·3	81·4
1923	53·4	27·2	80·6
1924	52·6	27·9	80·5
1925	52·1	27·9	80·0
1926	49·6	30·6	80·2
1927	48·4	31·7	80·1
1928	47·6	32·6	80·2
1929	44·0	35·1	79·1

Table 116.—Employees, Salaries and Wages, in the Nickel-Copper Industry in Canada, 1928 and 1929.

—	1928				1929			
	Number			Salaries and wages	Number			Salaries and wages
	Male	Female	Total		Male	Female	Total	
				$				$
Salaried employees—								
Mine and mill	43	1	44	142,249	46	1	47	151,655
Smelters and refinery	128	15	143	464,560	149	17	166	537,697
Total	**171**	**16**	**187**	**606,809**	**195**	**18**	**213**	**689,352**
Wage-earners—								
Mine and mill	1,919	.....	1,919	2,994,589	3,172	.....	3,172	4,954,220
Smelters and refinery	2,036	1	2,037	3,062,121	2,875	.....	2,875	4,473,625
Total	**3,955**	**1**	**3,956**	**6,056,710**	**6,047**	.....	**6,047**	**9,427,845**
Grand total	**4,096**	**17**	**4,113**	**6,663,519**	**6,242**	**18**	**6,260**	**10,117,197**

Table 117.—Employees by Months in the Nickel-Copper Industry in Canada, 1928 and 1929

Month	Mine		Mill	Smelters	Refinery	Total
	Surface	Underground				
1928						
January	368	1,079	119	1,188	505	**3,259**
February	366	1,089	119	1,460	609	**3,343**
March	351	1,108	116	1,154	624	**3,353**
April	360	1,137	115	1,134	655	**3,401**
May	371	1,173	116	1,166	715	**3,541**
June	392	1,215	114	1,221	770	**3,712**
July	416	1,291	108	1,239	788	**3,842**
August	450	1,378	117	1,232	924	**4,101**
September	520	1,494	115	1,237	930	**4,296**
October	533	1,575	120	1,250	985	**4,463**
November	514	1,653	115	1,247	1,018	**4,547**
December	494	1,641	128	1,295	1,043	**4,601**
1929						
January	454	1,748	173	1,406	1,079	**4,860**
February	470	1,800	190	1,452	1,123	**5,035**
March	526	1,800	169	1,471	1,134	**5,139**
April	542	1,916	215	1,484	1,187	**5,444**
May	683	1,990	215	1,491	1,281	**5,659**
June	706	2,173	225	1,549	1,393	**6,046**
July	728	2,232	232	1,607	1,466	**6,265**
August	753	2,429	243	1,568	1,473	**6,466**
September	777	2,556	242	1,623	1,392	**6,590**
October	794	2,711	239	1,681	1,419	**6,844**
November	816	3,010	248	1,779	1,380	**7,233**
December	806	2,906	219	1,771	1,301	**7,003**

NICKEL

Production figures include nickel in matte and speiss 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 and salts sold, valued in the aggregate at the sum obtained from the sales of oxides and salts.

Table 118.—Production of Nickel from Canadian Ores, 1920-1929

(For years 1889 to 1919 see 1928 report on the Mineral Production of Canada)

Year	Pounds of nickel	Value	Year	Pounds of nickel	Value
		$			$
1920	61,335,706	24,534,282	1925	73,857,114	15,946,672
1921	19,293,060	6,752,571	1926	65,714,294	14,374,163
1922	17,597,123	6,158,993	1927	66,798,717	15,262,171
1923	62,433,843	18,332,077	1928	96,755,578	22,318,907
1924	69,536,350	19,470,178	1929	110,275,912	27,115,461

Table 119.—Production in Canada, Imports and Exports of Nickel 1927-1929

—	1927		1928		1929	
	Quantity	Value	Quantity	Value	Quantity	Value
	Pounds	$	Pounds	$	Pounds	$
PRODUCTION—						
Nickel in matte and speiss exported*	31,584,097	5,685,138	37,783,901	6,801,118	28,172,633	5,071,074
Refined and electrolytic nickel produced	28,469,996	7,497,436	49,144,875	12,596,371	79,704,762	18,639,814
Nickel in oxides and salts sold	6,744,624	2,079,597	9,826,712	2,921,418	11,398,517	3,404,573
Total	**66,798,717**	**15,262,171**	**96,755,578**	**22,318,907**	**110,275,912**	**27,115,461**
IMPORTS—						
Nickel, nickel silver and German silver, in ingots or blocks, n.o.p.	1,549,692	547,138	217,112	79,001	31,006	8,492
Nickel in bars and rods, strips, sheets and plates	825,715	233,360	730,106	240,378	1,243,865	388,296
Nickel silver and German silver, in bars, rods, strips, sheets, plates or anodes	77,940	26,639	168,494	57,191	258,445	94,827
Nickel chromium, in bars and rods	.....	.....	59,989	52,738	71,938	72,790
German, Nevada and nickel silver, manufactures of, not plated	.....	333,916	.....	382,730	.....	606,236
Nickel-plated household hollow-ware	.....	81,562	.....	85,138	.....	94,796
Nickel-plated ware, n.o.p.	.....	2,113,246	.....	2,451,421	.....	3,224,828
Total nickel and its products	.....	**3,335,867**	.....	**3,348,597**	.....	**4,499,265**
EXPORTS—						
Nickel, fine	29,015,800	7,895,211	51,188,700	13,220,034	68,408,200	17,544,513
Nickel contained in matte	36,458,800	5,784,623	36,370,800	5,457,222	29,630,700	4,501,389
Nickel in oxide	5,196,100	1,600,986	9,607,200	3,004,951	11,600,900	3,489,782
Total	**70,670,700**	**15,281,820**	**97,166,700**	**21,782,207**	**109,639,800**	**25,535,684**

*Nickel in matte and speiss exported valued at 18 cents per pound.

Table 120.—World Production of Nickel Ore, 1925-1929

(In terms of metal)

(From the Mineral Industry of the British Empire and Foreign Countries)

(Short tons)

Country	1925	1926	1927	1928	1929
British Empire—					
Canada	36,929	32,860	33,399	48,378	55,138
India (b)	.....	(a)	284	814	930
Australia	.....	.....	96	.....	95
Foreign countries—					
Italy	7	.....	.....	.....	.....
Greece	.....	30	28	726	(a)
Norway	.....	.....	179	451	483
United States (c)	272	306	860	522	343
New Caledonia (d)	3,718	4,220	3,543	2,003	4,584
World's Total	**40,926**	**37,416**	**38,389**	**52,954**	**61,573**

(a) Information not available.
(b) Nickel metal in speiss obtained as a by-product in smelting operations.
(c) Nickel content of salts and nickel produced as a by-product in the electrolytic refining of copper.
(d) Nickel content of exports.

COPPER

Canada

Copper production includes copper contained in ores and concentrates exported, copper in blister copper made, in matte exported and in copper sulphate made during the year.

Refined copper was produced commercially in quantity for the first time in Canada in 1916 at the Trail refinery of the Consolidated Mining and Smelting Company. The British America Nickel Corporation which produced refined copper at the Deschenes refinery for the first time in 1920, went into liquidation during July, 1924.

A new plant for the electrolytic refining of copper is under construction at Copperclifff, Ontario. This refinery is expected to reach production in 1930. Electrolytic copper reached 18 cents in 1929, the highest price recorded since 1919.

Table 121.—Production of Copper from Canadian Ores, 1886-1929

Year	Pounds	Value	Cents per pound	Year	Pounds	Value	Cents per pound
		$				$	
1886	3,505,000	385,550	11·00	1909	52,493,863	6,814,754	12·982
1887	3,260,424	366,798	11·25	1910	55,692,369	7,094,094	12·738
1888	5,562,864	927,107	16·66				
1889	6,809,752	936,341	13·75	1911	55,648,011	6,886,998	12·376
1890	6,313,671	947,153	15·75	1912	77,832,127	12,718,548	16·341
				1913	76,976,925	11,753,606	15·269
1891	9,529,401	1,226,703	12·87	1914	75,735,960	10,301,606	13·602
1892	7,087,275	818,580	11·55	1915	100,785,150	17,410,635	17·275
1893	8,109,856	871,809	10·75				
1894	7,708,789	736,960	9·56	1916	117,150,028	31,867,156	27·202
1895	7,771,639	836,228	10·76	1917	109,227,332	29,697,989	27·180
				1918	118,789,434	29,250,536	24·628
1896	9,393,012	1,021,960	10·88	1919	75,053,581	14,028,265	18·691
1897	13,300,802	1,501,660	11·29	1920	81,600,691	14,244,217	17·456
1898	17,717,136	2,134,980	12·03				
1899	15,078,475	2,655,319	17·61	1921	47,620,826	5,953,555	12·502
1900	18,937,138	3,065,922	16·19	1922	42,879,818	5,738,177	13·382
				1923	86,881,537	12,529,186	14·421
1901	37,827,019	6,096,581	16·117	1924	104,457,447	13,604,538	13·024
1902	38,804,259	4,511,383	11·626	1925	111,450,518	15,649,882	14·042
1903	42,084,451	5,649,487	13·235				
1904	41,383,722	5,306,635	12·823	1926	133,094,942	17,490,300	*
1905	48,092,753	7,497,660	15·590	1927	140,147,440	17,195,487	*
				1928	202,696,046	28,598,249	*
1906	55,609,888	10,720,474	19·278	1929	248,120,760	43,415,251	*
1907	56,979,205	11,398,120	20·004				
1908	63,702,873	8,413,876	13·208	**Total**	**2,639,214,206**	**430,269,309**	

Since 1926 the value of Canada's copper production was computed according to the note on page 269.

Table 122.—Production of Copper in Canada, by Provinces and by Sources, 1928 and 1929

Production	1928		1929	
	Pounds	Value	Pounds	Value
		$		$
By Provinces—				
Quebec	33,697,949	4,909,791	55,337,169	10,019,901
Ontario	66,607,510	8,770,149	88,879,853	14,622,572
British Columbia	102,283,210	14,902,664	103,903,738	18,772,778
Yukon	*107,377	15,645	.....	.....
Total	**202,696,046**	**28,598,249**	**248,120,760**	**43,415,251**
By Sources—				
In blister copper produced	124,824,371	18,322,883	160,190,580	28,059,843
In copper sulphate produced	192,850	28,098	154,357	27,950
In ores exported	51,235,921	7,470,763	69,555,356	12,504,388
In nickel-copper matte exported	26,442,904	2,776,505	18,220,467	2,733,070
Total	**202,696,046**	**28,598,249**	**248,120,760**	**43,415,251**

*Copper in silver-lead ores exported during 1925–1928 inclusive.

Table 123.—Production of Refined Copper in Canada, 1916-1929

Year	Tons	Year	Tons
1916	483	1923	824
1917	3,901	1924	1,768
1918	3,809	1925	170
1919	3,467	1926	10,581
1920	2,590	1927	9,191
1921	2,143	1928	8,806
1922	365	1929	3,518

Table 124.—Production of Copper Sulphate in Canada, 1921-1929

Year	Pounds	Year	Pounds
1921	643,919	1926	404,862
1922	230,835	1927	566,825
1923	307,135	1928	771,400
1924	127,301	1929	617,430
1925	121,746		

The Consolidated Mining and Smelting Co. Ltd. of Trail, B.C., is the only company producing copper sulphate in Canada, the output being used by them in their own plant. Formerly the Coniagas Reduction Company at Thorold, Ontario, was also a producer.

Quebec

Production of copper from the province of Quebec included the estimated recovery of copper contained in concentrates shipped from the Consolidated Copper and Sulphur Company, Limited (formerly the Eustis mine) and the copper in blister copper made at the Noranda smelter from Quebec ores.

Ontario

Statistics of copper production in Ontario for 1929 included the copper contained in converter copper made at Port Colborne, Ontario, by the International Nickel Company, Limited, the copper in nickel-copper matte exported by the same company; the recoverable copper in flotation concentrates exported by silver-cobalt and copper-lead-zinc mines, and the recoverable copper in concentrates exported by the Argonaut Gold mine.

The bounty offered by the Ontario government on copper 95 per cent pure and on copper sulphate produced from ore mined and refined in the province was never gained and the Act, known as the *Metal Refining Bounty Act* warranting the bounty, which expired April 10, 1917, was not re-enacted.

British Columbia

British Columbia was credited in 1929 with a production of 103,903,738 pounds, the greatest of any year on record, and as compared with 102,283,210 pounds in 1928. The output from this province amounted to 42 per cent of the total Canadian production for 1929 as against 50 per cent in 1928.

In this total there are included the quantities of blister copper produced at Anyox by the Granby Consolidated Mining, Smelting and Power Company; blister copper made by the Consolidated Mining and Smelting Company at Trail; copper contained in copper sulphate made by the same company; and the copper estimated as recoverable from ores and concentrates exported. The principal copper-producing mines in British Columbia are the Britannia mine on Howe Sound which ships its concentrates to Tacoma, Washington, U.S.A.; the Hidden Creek and Bonanza mines on Portland Canal; and the Copper Mountain Mine, owned and operated by the Grandby Consolidated Mining, Smelting and Power Company, Limited. The Hidden Creek and Bonanza ores are smelted at the Anyox smelter and the Allenby concentrates, from Copper Mountain ore, were shipped to the Trail and Tacoma smelters. Small shipments were made from several other mines to both Trail and Foreign smelters.

Table 125.—Quantity and Value of Copper Produced in Canada, by Provinces, 1919-1929

(For production in previous years see Mineral Production of Canada, 1928)

Year	Quebec		Ontario		Manitoba		British Columbia		Yukon	
	lb.	$	lb.	$	lb.	$	lb.	$	lb.	$
1919	2,691,695	503,105	24,346,623	4,550,627	3,348,000	625,775	44,502,079	8,317,884	165,184	30,874
1920	880,638	153,724	32,059,993	5,598,392	3,062,577	534,604	45,319,771	7,911,019	277,712	48,478
1921	352,308	44,045	12,821,385	1,602,930	.....	.....	34,447,127	4,306,580	.....	.....
1922	.....	.....	10,943,636	1,464,477	.....	.....	31,936,182	4,273,700	.....	.....
1923	.....	.....	34,656,800	4,565,227	.....	.....	55,224,737	7,963,959	.....	.....
1924	1,893,008	246,546	37,113,193	4,833,622	.....	.....	65,451,246	8,524,370	.....	.....
1925	2,510,141	352,474	39,718,777	5,577,311	.....	.....	69,221,600	9,720,097	.....	.....
1926	2,674,058	308,886	41,312,867	4,828,964	.....	.....	89,108,017	12,292,450	.....	.....
1927	3,119,848	403,084	45,341,295	4,946,533	.....	.....	91,686,297	11,845,870	.....	.....
1928	33,697,949	4,909,791	66,607,510	8,770,149	.....	.....	102,283,210	14,902,664	*107,377	15,645
1929	55,337,169	10,019,901	88,879,853	14,622,572	.....	.....	103,903,738	18,772,778	.....	.....

* Includes small quantities produced in 1925, 1926 and 1927 but not reported until 1928.

Table 126.—Imports into Canada and Exports of Copper, 1927-1929

	1927		1928		1929	
	Pounds	Value	Pounds	Value	Pounds	Value
		$		$		$
IMPORTS—						
Copper in bars or rods, when imported by manufacturers of trolley, telegraph and telephone wires, electric wires and electric cables for use only in the manufacture of such articles in their own factories	26,384,000	3,719,260	36,063,400	5,537,148	54,824,600	9,922,096
Copper in bars or rods, in coil or otherwise, in lengths of not less than 6 feet, unmanufactured	732,100	128,144	539,300	102,740	719,200	164,642
Copper in blocks, pigs or ingots	3,795,607	510,771	7,883,600	1,176,941	12,084,000	2,246,600
Copper, old and scrap	5,817,100	737,029	5,606,300	785,141	4,958,200	827,832
Copper, ore and concentrates	500	530	100	52	.....	.....
Copper, in strips, sheets or plates not polished or coated	1,836,700	385,477	2,586,700	521,559	2,806,300	698,974
Copper tubing in lengths of not less than 6 feet, and not polished, bent or otherwise manufactured	2,124,343	506,745	2,549,901	602,730	2,662,706	721,369
Copper wire, plain, tinned or plated	434,372	108,662	827,059	217,735	937,858	267,464
Copper wire cloth, or woven wire of copper	.....	19,580	.....	14,128	.....	9,613
Copper wire, single or several, covered with cotton, linen, silk, rubber or other material, including cable so covered	.....	509,312	.....	677,923	.....	809,729
Copper, all other, manufactures of, n.o.p.	.....	644,534	.....	1,074,156	.....	1,313,811
Copper, precipitate of, crude	.....	.....	3,825	102	.....	.....
Anodes of nickel, zinc, copper, silver or gold	.....	10,050	.....	15,853	.....	16,127
Copper, sub-acetate of, or verdigris, dry	3,389	688	410	94	681	177
Copper, sulphate of (blue vitriol)	4,110,695	198,553	3,741,971	190,515	2,118,304	114,637
Copper, sulphate of, dehydrated, for agricultural or spraying purposes	586,426	29,696	1,627,074	84,130	2,252,122	122,056
Copper rollers adapted for use in calico printing	.....	5,526	.....	21,003	.....	37,664
Total	.....	**7,514,557**	.....	**11,021,956**	.....	**17,272,791**
EXPORTS—						
Copper, fine, contained in ore, matte regulus, etc	72,841,200	7,371,542	76,427,900	7,023,884	86,999,100	8,944,965
Copper, blister	54,258,800	6,667,270	104,764,700	15,375,344	148,278,500	26,711,867
Copper, old and scrap	5,912,500	602,494	8,061,700	869,839	11,559,600	1,574,712
Copper, pig	11,200	1,734	.....	.....	.....	.....
Copper in bars, rods, strips, sheets, plates and tubing	248,100	63,165	158,200	40,988	132,100	35,900
Copper wire and cable	.....	199,817	.....	259,430	.....	119,030
Copper mfrs., n.o.p.	.....	46,757	.....	25,930	.....	13,522
Total	.....	**14,952,779**	.....	**23,595,415**	.....	**37,399,996**

Table 127.—Monthly Average Prices of Copper (Electrolytic), New York and London, 1927-1929

(From the *Engineering and Mining World*)

—	New York (In cents per pound)			London (£Sterling per long ton)		
	1927	1928	1929	1927	1928	1929
January	12·990	13·854	16·603	62·375	66·575	78·602
February	12·682	13·823	17·727	61·119	66·381	83·538
March	13·079	13·845	21·257	62·641	66·413	98·356
April	12·808	13·986	19·500	61·526	66·500	89·405
May	12·621	14·203	17·775	60·881	67·216	83·727
June	12·370	14·527	17·775	59·881	68·738	84·013
July	12·532	14·527	17·775	60·089	68·670	84·043
August	12·971	14·526	17·775	62·227	68·750	84·250
September	12·940	14·724	17·775	61·830	69·890	84·363
October	12·958	15·202	17·775	62·256	71·935	83·978
November	13·319	15·778	17·775	63·761	74·750	82·202
December	13·774	15·844	17·775	66·181	75·000	82·569
Average	**12·920**	**14·570**	**18·107**	**62·064**	**69·230**	**84·921**

Table 128.—World Production of Copper, 1925-1929

(Imperial Institute Publication)

(Short tons)

Producing country	1925	1926	1927	1928	1929
BRITISH EMPIRE					
United Kingdom	106	121	198	76	76
Northern Rhodesia (smelter)	83	793	3,685	6,642	6,122
Southern Rhodesia (smelter)	1,888	8	.....	122	349
South-West Africa (d)	9,184	9,856	11,760	12,432	13,888
Union of South Africa	8,618	9,723	10,220	9,701	9,937
Canada	55,726	66,547	70,074	101,348	124,060
Cyprus	3,881	3,368	4,480	5,488	6,384
India (estimated)	5,488	6,496	6,720	6,272	8,848
Australia	13,235	9,769	11,170	10,602	14,349
Papua (years ended June 30)	601	1,858	134	.....	.....
Total	99,000	109,000	119,000	152,000	184,000
FOREIGN COUNTRIES					
Austria	2,028	2,467	2,572	3,345	2,294
Bulgaria (ore)	1,635	2,056	12,052	12,029	34,580
Czechoslovakia	597	1,014	1,700	1,791	(c)
Finland	1,539	1,092	909	2,102	(c)
France	160	(a) 10,528	(a) 271	(c)	(c)
Germany	26,955	30,520	30,961	28,895	31,948
Italy	913	1,823	1,865	906	(c)
Jugoslavia	8,048	11,700	11,424	14,560	22,400
Norway	15,058	14,907	13,629	19,597	20,987
Portugal (estimated)	3,808	2,240	3,360	2,240	4,480
Rumania (smelter)	147	208	237	114	158
Russia (estimated)	7,280	13,216	15,008	22,288	29,120
Spain	52,294	48,691	56,000	59,360	63,840
Sweden	235	782	864	682	(c)
Algeria	1,432	(a) 2,743	287	.....	67
Belgian Congo (smelter)	99,323	88,889	98,278	123,962	151,007
French Equatorial Africa	336	423	551	260	(c)
French Morocco	.....	13	.....	.....	.....
Tunis (Ore)	.....	.....	82	.....	.....
Cuba	11,863	13,033	15,538	18,869	16,486
Mexico	67,768	59,264	74,445	72,208	95,409
United States	839,059	872,509	824,980	904,895	1,006,202
Argentina	896	896	.....	.....	.....
Bolivia (exports)	7,976	8,977	9,622	9,353	7,923
Chile	268,103	(b) 280,000	267,463	316,141	352,519
Peru	40,635	47,332	60,703	62,778	(c)
Venezuela (estimated)	1,120	1,120	168	.....	.....
Japan (smelter)	73,289	74,257	73,382	75,214	79,076
Korea (smelter)	1,117	1,898	1,107	670	603
Turkey (black copper)	.....	.....	.....	15	72
Total	1,534,400	1,579,200	1,556,800	1,736,000	1,948,800
World's Total	**1,635,200**	**1,691,200**	**1,680,000**	**1,892,800**	**2,128,000**

(a) Ore; copper content not stated.
(b) Estimated.
(c) Information not available.
(d) Years ended March 31 of the year following that stated.

METALS OF THE PLATINUM GROUP

Metals of the platinum group produced from Canadian ores include platinum, palladium, rhodium, iridium, etc., recovered in the refining of nickel-copper matte from the Sudbury district; minor quantities of platinum from British Columbia placers and some platinum and palladium recovered from ores smelted at Trail, British Columbia.

Canada probably stands fourth in the world's production of these metals, larger amounts coming from Russia, South Africa and Colombia, South America. In British Columbia, small quantities of platinum are found in placer deposits with alluvial gold and black sands; in Ontario these rare metals occur with the nickel-copper-sulphide ores of the Sudbury district. Copper-nickel matte containing the precious metals is made at Coniston, and at Coppercliff by the International Nickel Company, Limited. The Coppercliff matte is shipped either to the United States, for manufacture into monel metal, or to Port Colborne, Ontario, for refining. When the copper and nickel are removed, the residues are further refined for the recovery of gold, silver, platinum and palladium and smaller amounts of rhodium and iridium. The Coniston matte is shipped to Clydach, Wales, where the metals of the platinum group are recovered in the refining process.

An estimate of 200,000 ounces is made for the world's platinum production in 1929. This figure, however, is rather speculative owing to the difficulty in obtaining accurate information regarding the Russian output.

A considerable increase in the Canadian production of the platinum group metals will almost certainly result on completion of the elaborate mining and metallurgical developments of the International Nickel Company at Sudbury, Ontario.

Table 129.—Production of the Platinum Group Metals in Canada, 1928 and 1929

—	Platinum		Palladium, Rhodium Iridium, etc.	
	Ounces	Value	Ounces	Value
1928		$		$
Ontario	10,452	704,360	13,087	605,563
British Columbia	80	4,549	520	22,270
Total	**10,532**	**708,909**	**13,607**	**627,833**
1929				
Ontario	12,474	843,928	17,141	802,453
British Columbia	45	2,828	177	6,836
Total	**12,519**	**846,756**	**17,318**	**809,289**

Table 130.—Production of Platinum in Canada from Alluvial Sands, 1920-1929

(For years 1887 to 1919 see 1928 Mineral Production of Canada)

Year	Fine ounces	Value	Year	Fine ounces	Value
		$			$
1920	17	791	1925	6	715
1921	23	1,558	1926	50	4,258
1922	12	1,154	1927	11	960
1923	7	816	1928	49	2,819
1924	5	569	1929	28	1,699

Table 131.—Production of Metals of the Platinum Group, 1920-1929

(From 1887 to 1919 see Mineral Production of Canada, 1928)

Year	Platinum				Palladium	
	Lode		Placer			
	Fine oz.	$	Fine oz.	$	Fine oz.	$
1920	(c) 489 (d) 89	31,296 5,665	17	719	(c) 739 (d) 174	 11,096
1921	269	21,014	23	1,585	590	26,613
1922	458	44,709	12	1,154	724	47,060
1923	1,210	141,010	7	816	1,732	138,560
1924	9,181	1,090,858	5	569	8,923	811,993
1925	8,692	1,027,477	6	715	7,856	608,727
1926	9,471	919,349	50	4,258	9,790	626,166
1927	11,217	716,653	11	960	11,247	541,319
1928	10,483	706,090	49	2,819	11,909	511,998
1929	12,491	845,057	28	1,699	12,408	471,614

Year	Rhodium		Ruthenium		Osmium		Iridium	
	Fine oz.	$	Fine oz.	$	Fine oz.	$	Fine oz.	$
1920	390 20	1,249	.....	.....	(f) 102	.....	.....	.....
1921	256 56	3,433	.....	.....	(f) 11	.....	.....	.....
1922	104	.....	.....	.....	(f) 391	31,280	.....	.....
1923	206	18,540	.....	.....	.....	.....	98	26,460
1924	367	27,500	78	2,106	69	4,924	79	16,590
1925	.....	.....	.....	.....	(f) 432	40,242	.....	.....
1926	204	9,969	16	791	.....	.....	14	3,252
1927	222	6,853	31	1,073	.....	.....	45	4,945
1928	895	20,951	561	16,331	.....	.....	242	78,553
1929	3,037	151,850	1,376	66,048	.....	.....	497	119,777

(c) Recovery of platinum group metals at International Nickel Company's plant, New Jersey, U.S.A. Not necessarily all from Sudbury ores.
(d) Crude oz.
(e) Included with platinum and palladium.
(f) Includes osmium, iridium and ruthenium.

Platinum is recovered in a small way at the Royal Mint in the form of platinum black a dull black powder of metallic platinum, obtained from the treatment of dental and old jewellery scrap. The following tables show the recoveries since 1923.

Table 132.—Recovery of Platinum "Black", at the Royal Mint, Ottawa, 1923-1929

—	Platinum	
	Ounces gross	Value
		$
1923	4·520	393·47
1924	16·186	1,408·99
1925	9·500	*
1926	10·700	*
1927	54·150	*
1928	16·350	*
1929	34,200	*

*No sales.

Table 133.—Imports into Canada and Exports of Platinum, 1927-1929

—	1927		1928		1929	
	Fine ounces	Value	Fine ounces	Value	Fine ounces	Value
		$		$		$
IMPORTS—						
Crucibles	.....	8,581	.....	10,838	.....	13,019
Wire and bars, strips, sheets or plates	.....	94,538	.....	136,777	.....	157,774
Retorts, pans, condensers, etc.	.....	26,901	.....	2,881	.....	41,113
Total	.....	**130,020**	.....	**150,496**	.....	**211,906**
EXPORTS—						
Ores and concentrates	771	52,660	1,212	77,908	2,798	220,200
Old and scrap	221	15,789	424	27,463	112	5,319
Total	.....	**68,449**	.....	**105,371**	.....	**225,519**

Table 134.—Monthly Average Prices of Refined Platinum, 1927-1929

(From *The Engineering and Mining World*)

(In dollars per fine ounce)

Month	1927	1928	1929
	$	$	$
January	109·520	79·280	70·000
February	107·545	84·783	70·000
March	108·000	80·000	70·000
April	101·885	80·000	70·000
May	84·680	78·000	68·615
June	72·000	78·000	68·000
July	72·000	78·000	68·000
August	72·000	78·000	68·000
September	72·000	78·000	66·000
October	72·000	78·000	65·000
November	72·000	76·417	65·000
December	72·000	74·480	63·240
Average	**84·636**	**78,580**	**67·655**

Table 135.—Platinum Metals Consumed in the United States as Reported by Refiners and by Industries, 1928 and 1929

(From *Mineral Resources of the United States*, 1929.)

(In Troy ounces)

Industry	Platinum	Palladium	Iridium	Others	**Total**	Percentage of total
1928						
Chemical	18,529	1,252	113	135	20,029	10·68
Electrical	21,316	9,150	1,525	2	31,993	17·07
Dental	10,930	12,270	167	10	23,377	12·47
Jewellery	93,468	4,965	3,260	815	102,508	54·77
Miscellaneous	5,431	2,136	963	850	9,380	5·01
Total	**149,674**	**29,773**	**6,028**	**1,812**	**187,287**	**100·00**
1929						
Chemical	20,260	1,345	113	233	21,951	11·00
Electrical	20,746	18,856	1,014	89	40,705	21·00
Dental	13,051	12,156	788	236	26,231	14·00
Jewellery	84,039	4,451	3,737	851	93,078	49·00
Miscellaneous	7,234	1,048	347	1,025	9,654	5·00
Total	**145,330**	**37,856**	**5,999**	**2,434**	**191,619**	**100·00**

Table 136.—World Production of Platinum (a), 1912-1929

(In troy ounces, fine platinum)

(From *The Mineral Industry* 1929)

Year	Abyssinia	Australia	Canada (b)	Columbia	Japan	Russia	South Africa (f)	United States (b)	Total
1912	.....	463	497	(d) 27,071	.....	(c) 250,000	.....	1,005	**279,036**
1913	.....	335	311	(d) 17,635	.....	(c) 210,000	.....	1,034	**229,315**
1914	.....	185	.....	(d) 16,264	.....	(c) 202,000	.....	1,484	**219,933**
1915	.....	43	475	(d) 18,749	.....	(c) 104,000	.....	(e) 1,190	**124,500**
1916	.....	62	1,040	(d) 25,592	.....	(c) 53,000	.....	(e) 2,780	**82,500**
1917	.....	197	1,036	(d) 26,421	.....	98,474	.....	(e) 6,280	**132,400**
1918	.....	461	705	(d) 34,266	.....	43,181	.....	(e) 9,740	**89,928**
1919	.....	162	690	(d) 32,236	1,575	39,425	.....	(e) 10,460	**87,803**
1920	.....	640	4,345	(c) 33,500	4,830	11,323	.....	(e) 11,500	**69,300**
1921	.....	189	5,412	(c) 34,000	8,014	5,500	.....	2,899	**55,200**
1922	.....	61	4,802	(d) 43,574	7,196	22,500	.....	1,998	**77,600**
1923	.....	445	6,810	(d) 40,676	4,665	34,700	.....	2,114	**96,000**
1924	.....	490	9,186	(d) 46,533	6,956	56,900	.....	3,523	**130,100**
1925	.....	573	8,698	45,000	4,519	94,800	5,490	4,325	**164,800**
1926	640	397	9,521	44,600	5,873	92,700	16,773	4,923	**175,700**
1927	1,200	226	11,228	(e) 45,800	6,169	(e) 100,000	25,043	4,449	(e) **194,000**
1928	2,400	.....	10,532	50,000	(e) 1,459	100,000	(e) 29,100	(e) 4,631	(e) **198,000**
1929	4,400	.....	12,519	.....	.....	.....	31,700	(e) 5,620	(e) **200,000**

(a) Estimated content of fine platinum contained in crude platinum output. There has been a small production in some years from India, Borneo, Japan and other countries, but none of importance.
(b) Platinum of domestic source recovered by refiners. For total Canadian production see table 131.
(c) Estimated by J. M. Hill, U.S. Bureau of Mines.
(d) Exports.
(e) Estimated.
(f) All platinum group metals.

CHAPTER FIVE

MISCELLANEOUS METAL MINING INDUSTRIES IN CANADA

Including General Statistics Relating to the Industries in this Group and Commodity Statistics, Showing Production by Provinces, Imports, Exports, Prices and World Output Tables on Aluminium, Antimony, Chromite, Iron Ore, Pig Iron and Ferro-Alloys, Steel and Rolled Products, Manganese, Mercury, Molybdenum, Tin and Tungsten.

1. General Review

Several metallic minerals, produced or treated in each instance by a single operator, or perhaps by a few operators, only, have been grouped in this report for consideration as a single industry. There is little that can be said in a general way about these various producers. Iron and steel, and aluminium are products of large, well-organized concerns, however both of these products are made in Canada solely from imported ores. Aluminium smelting is, therefore, of interest to the mining industry wholly because of the processes employed in the reduction of the metal from bauxite ore. Iron ore is found in Canada in very extensive deposits, but as the grade available cannot be economically used without beneficiation, very little Canadian ore has been mined in recent years. Imported iron ore used in Ontario is mostly from the Mesabi range, Minnesota, U.S.A., while in the Maritime Provinces, Wabana ore, mined on Bell Island, Newfoundland, is chiefly used.

Other metallic mineral industries reviewed in this chapter, include the production of antimony, chromite, manganese, mercury, molybdenum, tin and tungsten these industries are, however relatively small, and their importance is largely determined by the extent of available supplies from other countries. When, as during the great war, production from other sources was insufficient to meet the increased demands for such products as chromite and manganese, the output from Canadian deposits found ready markets. At other times, with larger supplies available, from various foreign sources, operation of the Canadian properties has been found somewhat difficult owing to the keen competition of these other producers.

During the great war, some of these smaller industries attained very considerable importance, and it is always possible, that some future commercial development may occur that will lead once, again, to an appreciable expansion in these somewhat neglected fields.

For historical purposes and to provide the interested reader with the available data, tables have been prepared for this report that set out the known facts regarding production in these industries.

In 1929 the miscellaneous group included two producing titaniferous iron ore properties in Quebec; two developing molybdenite mines in the same province, and another of this mineral in British Columbia. One tungsten deposit was under development in Nova Scotia, and in Manitoba exploratory work was done on the tin, lithium and beryllium bearing dike rocks of the Winnipeg river section. A chromite occurrence and cinnabar deposit were under development in British Columbia and radio active mineral deposits were investigated in the Bancroft area in Ontario.

Table 137.—Employees, Salaries and Wages in the Miscellaneous Metal Mining Industries in Canada, 1928 and 1929

—	1928			1929		
	Number of employees		Salaries and wages	Number of employees		Salaries and wages
	Male	Female	$	Male	Female	$
Salaried Employees—						
Total	4	1	7,850	5	.....	11,090
Wage-Earners—						
Surface	35	.....	54,036	62	.....	31,747
Underground	22	.....		27	.....	
Total	57	.....	54,036	89	.....	31,747
Total	**61**	**1**	**61,886**	**94**	.....	**42,837**

Table 138.—*Wage-Earners in the Miscellaneous Metal Mining Industries in Canada, by Months, 1928 and 1929

Month	1928				1929			
	Number of wage-earners				Number of wage-earners			
	Surface	Underground	Mill	Total	Surface	Underground	Mill	Total
January	14	4	.....	18	.....	.....	.....	.....
February	24	16	.....	40	.....	.....	.....	.....
March	24	16	.....	40	.....	.....	.....	.....
April	21	15	.....	36	.....	.....	.....	.....
May	21	13	.....	34	8	.....	.....	8
June	30	22	.....	52	40	23	6	69
July	29	22	.....	51	42	26	6	74
August	24	12	.....	36	40	20	8	68
September	32	12	.....	44	27	20	8	55
October	37	12	.....	49	40	20	8	68
November	26	12	.....	38	12	20	8	40
December	19	4	.....	23	12	20	8	40

*See note page 37.

2.—Commodity Statistics on Aluminium, Antimony, Beryllium, Bismuth, Cadmium, Chromite, Iron Ore, Pig Iron, Ferro-Alloys, Steel and Rolled Products, Manganese, Mercury, Molybdenum, Tin and Tungsten

ALUMINIUM

While, so far, no commercial ores of aluminium have been discovered in Canada, production of aluminium from imported ores, chiefly mined in the United States, has been carried on in Canada at Shawinigan Falls, Quebec, since 1903, and in 1926 a new plant was built at Arvida near Lake St. John on the upper reaches of the Saguenay to increase the output of this metal by the only Canadian producer, the Aluminium Company of Canada. Both plants still use bauxite from the United States but it is expected that the Arvida plant, because of its accessibility to tide-water, will be able to bring in its raw material more cheaply by water from British Guiana than is now possible by rail, from United States mines.

As there is only one producing company in this industry, statistics regarding the smelting operations have been included with data supplied by the smelters producing non-ferrous metals from Canadian ores. Production of aluminium hollowware, such as kitchen utensils, and other fabricated products, is reviewed annually in the Bureau's report on the *Manufactures of the Non-Ferrous Metals*.

Aluminium is a product of the electric furnace. Alumina, which has previously been recovered by chemical means from bauxite, is dissolved in molten cryolite, in an electric furnace and a low voltage current is passed through the melt to decompose the oxide into metallic aluminium and oxygen; the metal sinks to the bottom of the crucible. The free oxygen attacks the carbon of the furnace electrode forming carbon dioxide gas and for this reason the electrode consumption is high. Theoretically, there should be no loss of cryolite but in actual operations losses occur, which must be made good from time to time. All cryolite ore is obtained from Greenland. Aluminium is used in the manufacture of alloys with other metals including copper, nickel, cobalt, iron, antimony, tin, zinc and magnesium, and there are many uses for the pure metal itself. Pure aluminium powder is used in the thermit process to reduce the oxides of certain metals to the metallic state. In the manufacture of some alloys, metals of low carbon content are required and in the preparation of these metals from their oxides, reduction by aluminium is found very desirable, and a great improvement over the older method of reduction by carbon. Powdered aluminium is also used in precipitation of gold and silver from cyanide solutions and because of its great affinity for oxygen, it is sometimes employed as a de-gasifier or a de-oxidizer in the manufacture of steel.

Consumption of aluminium is increasing with remarkable rapidity. This metal and its alloys are now being utilized in the construction of electrical transmission lines, motor cars, railroad coaches, street cars, oil tanks, radio equipment, window frames, flooring, girders, aircraft, and a host of other manufactures.

Table 139.—Imports of Aluminium and its Products into Canada and Exports of Aluminium, 1927-1929

—	1927		1928		1929	
	Pounds	Value	Pounds	Value	Pounds	Value
		$		$		$
IMPORTS—						
Alumina	253,235,300	6,036,019	65,748,300	1,494,545	910,000	25,026
Bauxite ore†	.....	.....	261,767,100	2,842,237	284,477,400	3,202,728
Cryolite ore	2,448,300	164,437	6,926,500	297,629	4,801,900	194,638
Aluminium—						
Ingots or blocks†	.....	.....	119,018	29,340	317,091	76,411
Bars and rods†	.....	.....	179,474	59,523	533,604	174,659
Sheets, strips or plates†	.....	.....	646,552	190,584	701,353	220,357
Ingots, blocks, bars, rods, strips, sheets or plates*	1,114,511	331,335	451,166	136,362	.....	.....
Leaf or foil	.....	260,936	.....	233,011	.....	197,164
Tubing	97,644	50,128	87,468	46,430	144,840	70,446
Net floats for sea or lake fishing only†	.....	.....	.....	637	.....	.....
Household hollow-ware	.....	271,680	.....	284,740	.....	393,577
Manufactures, n.o.p.	.....	780,676	.....	1,110,090	.....	1,482,288
Total	.....	**7,895,211**	.....	**6,725,128**	.....	**6,037,291**
EXPORTS—						
Aluminium—						
Bars, blocks, etc.	51,902,400	10,544,195	40,597,100	8,049,367	72,970,800	13,210,023
Kitchen utensils and hollow-ware†	.....	.....	.....	46,384	.....	48,233
Scrap	543,500	66,534	1,800,300	249,066	3,416,200	455,326
Manufactures, n.o.p.	.....	403,230	.....	712,874	.....	1,430,927
Total	.....	**11,013,959**	.....	**9,057,691**	.....	**15,144,509**

†April 1 to December 31, 1928.
*January 1 to March 31, 1928.

Table 140.—Monthly Average Prices of Ingot Aluminium, 1927-1929

(At New York in cents per pound 98 per cent grade)

(From the *Engineering and Mining World*)

Month	1927	1928	1929
January	26·270	24·300	24·300
February	26·000	24·300	24·300
March	26·000	24·300	24·300
April	26·000	24·300	24·300
May	26·000	24·300	24·300
June	26·000	24·300	24·300
July	26·000	24·300	24·300
August	26·000	24·300	24·300
September	26·000	24·300	24·300
October	25·600	24·300	24·300
November	25·000	24·300	24·300
December	24·785	24·300	24·300
Average	**25·808**	**24·300**	**24·300**

Table 141.—World Production of Aluminium, 1925-1929

(From *The Mineral Industry*, 1929)*

(Metric tons)

Country	1925	1926	1927	1928	1929
Austria	4,000	2,700	3,000	3,000	2,700
Canada	17,000	18,000	27,000	24,000	36,000
France	18,408	21,000	20,000	30,000	30,000
Germany	25,000	30,000	31,700	30,500	35,000
Great Britain	9,500	7,000	7,300	9,700	10,000
Italy	1,880	1,929	1,800	3,585	7,030
Norway	21,304	24,429	21,000	24,779	25,000
Switzerland	20,000	20,000	20,000	22,000	22,000
United States	66,000	68,000	72,000	95,440	102,270
Total	**183,092**	**193,058**	**203,800**	**243,004**	**276,000**

* The data in this table are as estimated by Robt. J. Anderson.

Table 142.—World Production of Bauxite, 1925-1929

(From *The Mineral Industry*, 1929)

(Metric tons)

Country	1925	1926	1927	1928	1929
Austria	(b) 4,000	(b) 5,000	(c)	(c)	(c)
British Guiana	197,458	222,518	192,986	165,422	167,000
British India	10,232	4,956	4,370	14,900	4,500
Dutch Guiana	85,501	46,400	169,700	203,000	240,000
France	406,421	408,600	540,000	597,810	643,021
Germany	1,767	(b) 15,000	2,400	6,860	3,000
Hungary	(c)	90,500	339,590	396,000	(c)
Italy (e)	198,000	(b) 5,000	95,300	62,200	197,000
Jugo-Slavia	79,010	(b) 150,000	100,327	49,200	20,000
Rumania	(b) 7,000	745	1,706	650	(c)
Ireland	5,120	(b) 6,000	5,394	(b) 5,000	5,000
United States	321,622	398,546	326,289	381,454	365,777
Spain	.....	.....	.....	181	180
Total	**1,316,131**	**1,353,265**	**(b)1,777,972**	**(b)1,882,677**	**(b)1,645,478**

(b) Estimated. (c) Data not available. (d) The bauxite deposits in the Bihar Mountains in Rumania were not exploited until the Great War at which time they were owned by Hungary. (e) Istria included under Italy.

ANTIMONY

Ores of antimony are known to occur in British Columbia, Manitoba, New Brunswick, Nova Scotia, Ontario, Quebec and the Yukon. The greater part of the Canadian output of refined antimony was produced in the years 1907, 1909, 1915 and 1916 by the Consolidated Mining and Smelting Company of Trail, B.C., as a by-product in the treatment of silver-lead ores. The remainder was from the New Brunswick ores treated locally.

There is an occurrence of auriferous stibnite ore and native antimony associated with arsenopyrite, pyrite and galena that was worked at West Gore, Hants county, Nova Scotia, during the war period, the ore being concentrated at the mine to a 38 to 45 per cent antimony content.

No antimony was produced in 1929, but 1,596 pounds worth $281, were recovered in 1926 from silver-lead-bismuth bullion obtained in the treatment of ores from the Cobalt district, exported for refining in the United States.

About 1850, stibnite and small quantities of native antimony were discovered in the slates and quartzites of Prince William, York county, New Brunswick. Attempts to smelt the ore locally failed, and for a time, the crude ore was shipped but this proved unprofitable and work was discontinued in 1890. In 1907 the deposit was re-worked and during the war period the ore was smelted and refined near lake George.

Antimony ores are rare in the province of Ontario, although it has been found in Hastings, Addington and Frontenac counties and with the silver of the Cobalt district. In South Ham, Wolfe county, Quebec, some work has been done on an antimony deposit.

There are several deposits of antimony in British Columbia. In the Bridge river area, Lillooet Mining Division, stibnite occurs in quartz. The ore contains, on the average, 40 to 60 per cent antimony, and is free from arsenic, zinc and lead; it also carries gold varying from a trace to one-half an ounce to the ton. A few shipments have been made from a deposit on the north fork of Carpenter creek in the Slocan district.

Antimony has also been found on Graham island, at Tatlayoko lake, Nanaimo district, and in the vicinity of Kamloops lake where it is associated with cinnabar.

In the Yukon territory antimony ores occur in the Carbon and Chieftain Hills near the Wheaton river.

Antimony is used in battery plates, grids, bearings, babbitt metal, solder, rubber goods, paints, fixtures, and for a variety of other purposes.

Table 143.—Production of Antimony in Canada, 1886-1929

Year	Antimony ore		Refined regulus		Antimony in silver-lead-bismuth bullion exported	
	Tons	Value	Pounds	Value	Pounds	Value
		$		$		$
1886	665	31,490				
1887	584	10,860				
1888	345	3,696				
1889	55	1,100				
1890	26½	625				
1891	10	60				
1892-1897						
1898	1,344	20,000				
1899-1904						
1905 (a)	527					
1906 (a)	782					
1907	2,016	65,000	63,850	5,108		
1908 (b)	148	5,443				
1909	35	1,575	61,207	4,285		
1910	364	13,906				
1911-1914						
1915	1,341	81,283	59,440	11,888		
1916	885	94,537	107,185	41,823		
1917	361	22,000				
1918-1924						
1925					1,751	206
1926					1,596	281
1927						
1928						
1929						

(a) As recorded by the Nova Scotia Department of Mines: no value given.

(b) Exports.

Table 144.—Imports of Antimony into Canada, 1927-1929

—	1927		1928		1929	
	Pounds	Value	Pounds	Value	Pounds	Value
		$		$		$
Antimony, or regulus of	1,284,483	143,446	1,529,823	140,958	1,746,525	147,643
Antimony salts	37,975	8,233	16,930	3,837	58,829	8,703
Antimony salts for dyeing	14,734	2,533	6,096	1,490	220	119
Total		**154,212**		**146,285**		**156,465**

Table 145.—Monthly Average Prices of Antimony, 1927-1929

(Compiled from quotations given in the *Engineering and Mining World*—"Ordinaries" stand for Hungarian, Chinese or other "Foreign" brands)

(At New York in cents per pound)

Month	1927	1928	1929
	Ordinaries	Ordinaries	Ordinaries
January	13·910	10·863	9·558
February	14·509	10·842	9·548
March	12·801	10·083	9·531
April	14·169	9·865	9·462
May	12·975	11·019	8·957
June	12·447	9·750	8·845
July	11·880	9·540	8·543
August	11·826	10·181	8·778
September	11·073	10·813	8·709
October	11·165	10·841	8·538
November	10·763	10·109	8·583
December	11·195	9·748	8·420
Average	**12·393**	**10·305**	**8·956**

World Production of Antimony.—China is by far the greatest antimony-producing country in the world, and as consumption of antimony in that country is only 1 per cent of its production, large quantities are available for export. There are many valuable deposits in the various provinces of China, but in the province of Hunan alone there is said to be 2,000,000 tons, much of which has not been developed.

Table 146.—World Production of Antimony, 1925-1929

(In terms of metal)

(From the "Mineral Industry of the British Empire"—"Imperial Institute")

(short tons)

Producing Country	1925	1926	1927	1928	1929
British Empire					
Southern Rhodesia	20	32	.....	55	.....
India (ore)	*11*	*121*	*560*	*414*	*86*
Australia	106	112	71	55	30
Canada	1	1	.....	.....	.....
Foreign Countries					
Austria	.....	34	1,180	1,260	784
Czechoslovakia	647	1,292	2,185	1,332	(a)
France	1,416	851	983	952	918
Italy	430	496	393	316	[illegible]
Jugoslavia	87	112	165	142	[illegible]
Spain	.....	19	15	9	(a)
Algeria	1,844	336	143	.....	.....
Morocco	.....	.....	.....	11	(a)
Mexico	1,476	2,885	2,121	3,944	[illegible]
United States	32	43	.....	41	.....
Bolivia (exports)	2,157	4,800	4,427	3,905	4,1[illegible]
Peru	19	109	133	155	(a)
Asia Minor (estimated)	448	448	448	448	[illegible]
China (exports)—					
Ore	*2,300*	*2,528*	*2,136*	*2,654*	(a)
Crude	3,026	3,568	2,582	3,503	4,295
Regulus	18,754	19,935	17,423	18,138	22,116
Korea	.....	6	.....	.....	.....
Turkey	.....	.....	28	108	8
Argentina (exports of ore)	44	.....	.....	.....	.....
Portugal	25	.....	.....	.....	.....
World's Total	**31,369**	**35,840**	**33,600**	**35,840**	**38,080**

(a) Information not available.

Beryllium

Shipments of beryl crystals were made to Germany in 1927 from a deposit in Lyndoch township, Ontario. Beryl occurrences in the pegmatites of eastern Manitoba were investigated during 1929. Interest has recently centred around the utilization of beryllium in both light and heavy alloys, a new plant for the recovery of metallic beryllium is reported under construction at Graz, Austria.

BISMUTH

Bismuth occurs in small quantities with ores of the Cobalt district and in ores treated at the Trail smelter in British Columbia. Some bismuth was recovered as metal in 1929 and some contained in silver-lead-bismuth bullion, was exported for treatment in United States smelters. During 1929 production of metallic bismuth and bismuth contained in exports amounted to 194,329 pounds valued at $307,114.

"The Mineral Industry, 1927" makes the following statements regarding uses for bismuth:

While a very large portion of the bismuth metal produced finds its way into pharmaceutical compounds, we find that all the manufacturers buy the pure metal, and from it prepare the bismuth compounds used in making their preparations.

Outside of its pharmaceutical uses the only other important demand for the metal comes from the makers of so-called "fusible alloys." These are prepared according to many formulae, but almost always contain large amounts of bismuth.

Quaternary alloys containing lead, tin, cadmium, and bismuth can be produced having fusion points below 100°C., and by varying the proportions any desired fusion point may be obtained. Such alloys are much used as solders for making fusible links for automatic sprinklers and firedoors.

Table 147.—World Production of Bismuth, 1925-1929

(Pounds)

(From the "Mineral Industry of the British Empire"—"Imperial Institute")

Producing Country and Description	1925	1926	1927	1928	1929
BRITISH EMPIRE					
Northern Rhodesia (metal)	.....	4,800	.....	.....	.....
Canada—					
Metal	17,600	5,800	1,900	12,500	173,500
India—					
Ore	.....	.....	48	82	88
Australia—					
Ore, etc	23,000	16,500	13,500	15,200	6,500
FOREIGN COUNTRIES					
Germany (Saxony)—					
Bismuth-cobalt-nickel ore	14,300	15,200	9,100	8,100	(a)
Rumania (metal)	100	.....	.....	.....	.....
Spain—					
Ore	285,400	190,900	189,000	253,900	(a)
Metal	73,500	52,300	41,600	46,900	(a)
Argentina—					
Ore	.....	.....	400	2,100	(a)
Bolivia (exports)—					
Content of ore and concentrates	662,000	439,100	213,600	267,900	297,400
Japan—					
Metal	53,100	50,600	44,400	63,300	(a)

(a) Information not available.
Bismuth was also recovered as a by-product in the refining of lead and zinc in the United States.

CADMIUM

Cadmium was produced for the first time in 1928 at the Trail refinery of the Consolidated Mining and Smelting Company, Limited, as a by-product of the silver-lead-zinc ores treated there. The output of this metal during 1929 was valued at $675,294.

"The Mineral Industry 1928" gives the following uses for cadmium.

There are four uses recently developed which account for the rapidly increasing demand for cadmium. It is being used in increasing amounts in making cadmium solders. The Udylite process is a rust-proofing process, in which iron articles such as locks, small hardware, and automobile parts are electroplated with the metal, after which the work is heated in an oven for several hours at a temperature of from 150-200°C. The Cadalyte process, which is an electro-

plating process giving a bright silver-like finish, is being extensively used. Cadmium plating is also used in connection with chromium plating, the work being first given a cadmium coat, then followed by the final chromium plate.

Other important uses of the metal or its compounds include: A small amount added to silver alloys makes the silver whiter and more resistant to tarnish. Cadmium has also other uses in jewelry, giving with gold a green alloy. When added to aluminium which is to be used in making powder it improves the colour and luster of the powder and makes it more resistant to corrosion. Cadmium still continues to be extensively used in making fusible alloys. When added in small amounts to copper, the wire drawn from the alloy has greater strength for use in transmission lines without having its conductivity appreciably reduced. It is reported that cadmium is being used in the manufacture of tungsten light filaments. An alloy of cadmium bismuth and mercury is impregnated with tungsten powder, the mixture made into wire by the extrusion process, heated to drive off the alloy, and then finished by heating in a vacuum to consolidate the tungsten. It has been used in the form of wire for spraying-rods for use in metal spray processes, plaster casts and other objects being thus coated with a thin layer of the metal. Storage battery plates of cadmium are being recommended. Such batteries do not deteriorate when standing discharged.

For many years cadmium sulphide, a brilliant yellow pigment has been extensively used for painting street cars, passenger coaches and other objects and materials where freedom from attack of sulphurous gases was desired; the quantity thus used sometimes exceeding that used as metal. Cadmopone, or cadmium lithopone is much cheaper, and for many purposes it is just as satisfactory. It is a mixture of cadmium sulphide and barium sulphate, being similar to lithopone except that the yellow cadmium sulphide replaces the white zinc sulphide. The oxide, hydroxide, and sulphate are used for the electrolytes in the various cadmium-plating processes. Other cadmium compounds such as the chloride, iodide, bromide, and nitrate find various uses in the chemical industries.

Sources.—Practically all the world's production comes from the treatment of the impure zinc solutions used for preparing electrolytic zinc, so that the potential output of cadmium bears a very direct relation to the amount of electrolytic zinc produced. Some cadmium is produced from smelter fluedusts, and a certain amount from the purification of zinc solutions used for making lithopone.

Table 148.—World Production of Cadmium, 1925-1929

(Pounds)

(From the "Mineral Industry of the British Empire"—"Imperial Institute")

Producing Country	1925	1926	1927	1928	1929
British Empire					
Canada	.....	.....	.....	491,894	773,976
Australia	400,661	358,912	346,773	385,616	445,907
Foreign Countries					
Belgium (exports)	.....	661	7,055	11,464	5,071
France	5,884	20,000	41,888	(a)	(a)
Germany (estimated)	100,000	100,000	100,000	100,000	100,000
Poland	7,835	11,574	13,558	9,288	(a)
United States—					
Metal	(c) 502,824	(c) 810,428	(c)1,074,054	1,875,896	2,481,427
Compounds (metal content)	.....	166,600	229,000	239,900	433,300
Mexico (b)	.....	.....	200,122	779,431	1,413,092

(a) Information not available.

(b) Recorded as cadmium, but probably zinc-cadmium fume exported to the United States for treatment.

(c) Excluding cadmium content of cadmium sulphide produced.

CHROMITE

The mineral chromite (FeO, Cr_2O_3) is the commercial source of the metal chromium, which is of prime importance in the manufacture of chrome steel armour plate and other similar steels. Chromium is a necessary constituent of many high-speed cutting tools, and its use is well established in the manufacture of stainless steels, in which it makes up from 12 to 14 per cent of the alloy.

Quebec has been the main source of chromite ore in Canada. Rhodesia, India, and New Caledonia, supply over 90 per cent of the world's chromite.

During the war when the higher grades of ore from other continents were not easily obtainable, many low-grade deposits in Canada and the United States were opened up, and for a time considerable metallurgical research was done in Canada on the reduction of chromium-bearing ores. Chromium metal may be obtained from chromium oxide by reduction with aluminium. The metal made in this manner is very pure and free from carbon. In less pure form, it has been made in the electric furnace directly from the ore. The resultant product made in this manner contains small percentages of iron and carbon but not sufficient to cause any serious trouble when the metal is used in the manufacture of alloys. Ferrochrome, also a product of the electric furnace, is made from a good grade of chromite ore, and the iron chromite alloy runs about 60 to 70 per cent chromium. This alloy can then be added in the required amounts to a bath of molten steel. Ferrochrome requirements take about 40 per cent of the world's supply of chromite; about 35 per cent of the chromite produced is used in the manufacture of chromite refractories such as brick and other furnace linings, and 25 per cent is used in the manufacture of chemicals.

Considerable research on the plating of chromium has resulted in much success. Because it does not tarnish readily and as chromium plate has a brilliant blue-white lustre, the use of chromium as a plating material has been greatly extended in recent years.

There has been no important production of chromite in Canada since 1923 when 3,558 tons valued at $52,650 were produced, in 1929 a property in British Columbia shipped 126 tons of this ore.

Systematic exploration and prospecting were carried on during the past year on chromite occurrences situated to the west of Lake Nipigon, Ontario.

Table 149.—Production of Chromite in Canada, 1886-1929

Year	Short tons	Value	Year	Short tons	Value
		$			$
1886	60	945	1911	157	2,587
1887	38	570	1912-13	.....	.....
1888-93	.....	.....	1914	136	1,210
1894	1,000	20,000	1915	12,341	179,543
1895	3,177	41,300			
			1916	(a) 27,517	311,460
1896	2,342	27,004	1917	(a) 36,725	499,682
1897	2,637	32,474	1918	21,994	867,122
1898	2,021	24,252	1919	8,541	228,898
1899	2,010	21,842	1920	11,016	251,379
1900	2,335	27,000			
			1921	2,798	55,696
1901	1,274	16,744	1922	767	11,503
1902	900	13,000	1923	3,558	52,650
1903	3,509	51,129	1924	.....	.....
1904	6,074	67,146	1925	.....	.....
1905	8,575	93,301			
			1926	.....	.....
1906	9,035	91,859	1927	.....	.....
1907	7,196	72,901	1928	.....	.....
1908	7,225	82,008	1929	126	900
1909	2,470	26,604			
1910	299	3,734	**Total**	**187,853**	**3,176,443**

(a) A portion of this ore was sold to a customs mill in the district and the final shipments of ores and concentrates in 1916 were 15,249 short tons valued at $310,902 or an average of $20.39 per ton: and 23,713 tons valued at $581,796 or an average of $24.54 per ton in 1917.

Table 150.—Production in Canada, and Imports of Chromite, 1927-1929

—	1927		1928		1929	
	Tons	Value	Tons	Value	Tons	Value
		$		$		$
PRODUCTION	.....	.....	.....	.....		
IMPORTS—					126	900
Bichromate of soda	1,030	121,209	1,045	122,378	898	127,828
Bichromate of potash	96	15,127	97	17,155	84	14,955
Brick, fire, chrome	.....	52,565	.....	56,375	.....	101,302

Table 151.—World Production of Chrome Ore, 1925-1929

(Short tons)

(From the "Mineral Industry of the British Empire"—"Imperial Institute")

Producing Country	1925	1926	1927	1928	1929
BRITISH EMPIRE					
United Kingdom	502	.....	423	.....	.....
Southern Rhodesia	135,827	181,194	218,018	219,428	293,116
Union of South Africa	15,164	13,274	18,694	35,006	70,520
Cyprus (shipments)	2,228	578	797	.....	2,737
Canada	.....	.....	.....	.....	127
India	41,946	37,388	64,072	50,910	55,513
Australia	1,079	669	.....	.....	144
Total	197,120	232,960	302,400	305,760	422,240
FOREIGN COUNTRIES					
Greece	8,905	22,100	19,086	23,097	(a)
Jugoslavia	13,404	17,619	9,653	18,387	33,653
Russia (years ended Sept. 30)	33,191	33,468	21,268	24,214	(a)
Cuba	33,410	39,800	17,950	32,088	44,531
United States	176	217	56	412	202
Brazil (exports)	.....	1,653	2,006	22	77
Japan	6,419	6,218	10,783	10,811	(a)
Turkey	22,400	22,400	20,192	13,061	17,833
New Caledonia	36,960	26,006	41,442	56,024	(b) 54,174
Guatemala (exports)	.....	59	(a)	.....	.....
Total	156,800	168,000	145,600	179,200	212,800
World's Total	**347,200**	**403,200**	**448,000**	**484,600**	**638,400**

(a) Information not available.
(b) Exports.

IRON ORE

Iron ore was first discovered in Canada in the St. Maurice valley, Quebec, as early as 1667, or perhaps earlier. Count Frontenac mined ore there five years later and the samples, tested in France, were found to be of workable quality.

In 1730 M. Franchville was granted a licence by Louis XIV of France together with a subsidy of 10,000 "livres" to work the St. Maurice iron mines. The project contemplated the construction of a blast furnace which apparently was not successful for, in 1735, he surrendered his rights to the government. Some years later another licence and a subsidy were given La Compagnie des Forges which made not only the iron kettles that were needed by the pioneers for making sugar and soap but furnished the French government with cannon for military enterprises. In 1743 the plant again reverted to the crown and was operated by the government until the country passed into the hands of the British.

Nova Scotia with its large iron and steel industry is not at present a producer of iron ore. Deposits of iron ore of various kinds are numerous throughout a large part of the province, Nova Scotia ranks next to Ontario in the matter of total production, however the large deposits of high-grade iron ore in Newfoundland owned and operated by the British Empire Steel Corporation, are much more readily accessible and of a higher and more constant grade than the deposits in Nova Scotia and for that reason the local deposits are not mined.

Iron ore mining and smelting were carried on to a small extent in New Brunswick but the ore was low-grade and the operations did not prosper.

Iron ore was first mined and smelted in the province of Quebec early in the eighteenth century, and from that time until 1883 the industry was carried on almost continuously at Three Rivers in the St. Maurice district. Other furnaces using local ore were operated at Radnor Forges and at Drummondville, the last to shut down being the Drummondville furnace in 1911. The ores used were bog ores, with charcoal for fuel. The output of all the furnaces was small and the industry owed its success to the superior quality of the pig iron produced.

Furnaces have also been built at various times and places in attempts to smelt some of the other classes of ore found in the province, these were all short lived, and none achieved commercial success.

More iron ore has been produced in Ontario than in any other province to date but at the present time no properties are producing. About 1896 a system of bounties, inaugurated by the Federal and Provincial Governments to encourage the manufacture of iron and steel from native ores, had the desired effect of stimulating the industry and the following year, blast furnaces were erected at various points in the province. Strenuous efforts were made to use Ontario ores as far as possible and thus obtain advantages of the bounties offered.

As a result, iron mining and prospecting for iron ore were stimulated but the grade found was generally low and contained deleterious material to such an extent that it was soon found unprofitable to operate.

In northwestern Ontario about 1899, a deposit of hematite that later developed in to the Helen mine, was found, this mine proved the main source of Ontario's iron output for a number of years. The high grade ore was exhausted and the mine is now closed down. Ontario has a large supply of low-grade iron ore, but beneficiation processes must be applied to make these ores suitable for commercial use.

Production of iron ore in British Columbia has been almost negligible up to the present time, however the small production has not been caused so much by the lack of ore as by the scarcity of a market for the ore. Different varieties of iron ore are found in various parts of the province, the most important of which are the magnetite deposits which occur on the islands along the coast. In some deposits the sulphur content is high, which would necessitate a preliminary roasting before charging to the blast furnaces; the ores are easily mined, are close to tide-water and would supply for some years a small iron-smelting industry providing the local demand for the products would justify its establishment.

Prospecting expeditions in 1929 visited the large iron ore deposits of the Belcher islands in Hudson Bay and those of the Koksoak and Hamilton rivers in Ungava. It is stated that the Ungava deposits may afford, in the future, an almost inexhaustible supply of high grade iron ore.

Table 152.—Shipments of Iron Ore from Canadian Mines, by Provinces, 1920-1929

(For years 1886 to 1919 see Mineral Production of Canada, 1928)

(Short tons)

Year	Quebec	Ontario	British Columbia	Canada
1920	960	126,912	1,200	129,072
1921	.....	58,499	1,010	59,509
1922	526	16,190	1,255	17,971
1923	69	30,447	243	30,759
1924	1,408	44	28	1,480
1925	3,978	.....	.....	3,978
1926	200	.....	.....	200
1927	2,029	.....	.....	2,029
1928	2,244	.....	.....	2,244
1929	2,748	.....	.....	2,748

Table 153.—Shipments of Iron Ore from Wabana Mines, Newfoundland, 1920-1929

(For years 1895 to 1919 see Mineral Production of Canada, 1928)

Year	To Nova Scotia	To United States	To Great Britain and Europe	Total shipments
	Short tons	Short tons	Short tons	Short tons
1920	624,596	.....	36,708	661,304
1921	178,519	.....	206,010	384,529
1922	311,482	.....	811,845	1,123,327
1923	451,483	.....	356,753	808,236
1924	174,602	.....	919,968	1,094,570
1925	384,795	.....	883,056	1,267,851
1926	465,961	.....	503,640	969,601
1927	480,757	68,354	946,569	1,495,680
1928	690,316	41,493	1,001,833	1,733,642
1929	763,168	85,501	850,370	1,699,039

Table 154.—Imports into Canada, and Exports of Iron Ore, 1928 and 1929

—	1928		1929	
	Quantity	Value	Quantity	Value
	Short tons	$	Short tons	$
IMPORTS—				
Iron ore from United States	1,563,984	3,419,168	1,640,500	3,999,239
Iron ore from Newfoundland	584,096	584,118	743,713	743,736
Iron ore from Sweden	55,633	247,985	58,554	266,317
Iron ore from other countries	19,184	73,888	5,040	16,973
Total	2,222,897	4,325,159	2,447,807	5,026,265
EXPORTS—**Total**	2,615	12,500	3,859	19,461

PIG IRON AND FERRO-ALLOYS, STEEL AND ROLLED PRODUCTS

Statistics of pig iron, steel and rolled products, are regarded as belonging to "Manufactures" rather than to "Mining" but the close relation between the mining of iron ore and the production of pig iron and steel justifies the inclusion here of references to these secondary industries. The data given in this section have been taken from the Bureau's annual bulletin on *The Primary Iron and Steel Industry in Canada, 1929.*

Sales form the primary iron and steel industry (including pig iron, ferro-alloys, steel ingots and direct steel castings and rolled iron and steel products) in Canada during 1929 amounted to $72,231,995, an increase of 16 per cent over the $62,071,674 reported in the previous year which in turn was 36 per cent over the $45,571,264 recorded for 1927.

Of the 45 firms engaged principally in this line of production, 18 were located in Ontario, 13 in Quebec, 6 in Nova Scotia, 4 in Manitoba, 3 in British Columbia and 1 in Alberta. These concerns reported fixed and working capital at $109,446,529, employed a monthly average of 11,218 people to whom was paid $18,534,681 in salaries and wages, and by manufacturing processes added $39,717,399 to the value of purchased materials which cost $32,514,596. An analysis of the sales values by provinces showed the following distribution: Ontario, $43,739,532; Nova Scotia, $16,044,488; Quebec, $10,344,845; Manitoba, $1,811,930; and Alberta and British Columbia, $291,200.

1. (a) *Pig Iron.*—Blast furnace production of 1,080,160 long tons of pig iron showed a gain of 4 per cent over the 1928 output of 1,037,727 tons. About 70 per cent of the output, or 753,889 tons, was shipped to the makers' own plants, 324,759 tons were sold and the remainder of 1,512 tons, not otherwise accounted for, was probably in stock at the end of the year. Production for the year included 770,478 tons of basic iron, 221,644 tons of foundry iron and 88,038 tons of malleable iron.

Based on an estimated population in Canada or 9,796,800 persons in 1929, the per capita production of pig iron amounted to 247 pounds as against 241 pounds in the previous year, 167 pounds in 1927, and an average of 178 pounds in 1926.

Ontario produced 71 per cent of the Canadian output in 1929, the same as in the previous year. Nova Scotia accounted for the remainder in each year.

Four firms in Canada produced pig iron during 1929, namely: The Dominion Iron and Steel Co., Sydney, N.S.; The Steel Company of Canada, Ltd., Hamilton, Ont.; The Algoma Steel Corporation, Ltd., Sault Ste. Marie, Ont.; and The Canadian Furnace Company, Ltd., Port Colborne, Ont.

Employees in blast furnace departments numbered 773 in 1929.

1. (b) *Ferro-alloys.*—Production of ferro-alloys in Canada during 1929 totalled 89,116 long tons as compared with 44,882 tons for last year. The following firms manufactured during 1929: Electro Metallurgical Company of Canada, Ltd., Welland, Ont. (including the Union Carbide Company of Canada); Canadian Carborundum Co., Ltd., Niagara Falls, Ont.; The Abrasive Company of Canada, Ltd., Hamilton, Ont.; The Exolon Company, Thorold, Ont.; and the Aluminum Company of Canada, Ltd., Arvida, P.Q. Only the first mentioned company has been included in the primary iron and steel industry, the other concerns being classified in other groups according to their principal products.

2. *Steel Ingots and Castings.*—Production of steel ingots and castings in 1929 was 1,378,024 tons, an increase of 12 per cent over the total of 1,234,719 tons for 1928. The year's figures included 1,309,606 tons of steel ingots and 68,418 tons of steel castings; practically all the ingots were intended for the further use of the makers while most of the castings were made for sale.

Per capita production in Canada of steel ingots and castings amounted to 316 pounds during the year under review, as compared with 288 pounds in 1928, an average of 213 pounds in 1927, and 185 pounds in 1926.

During the year 25 plants had furnaces for making steel ingots and direct steel castings. Quebec had 9 plants; Ontario, 7; Manitoba, 3; British Columbia 3; Nova Scotia, 2; and Alberta, 1.

Employees in these steel plants numbered 4,594 in 1929.

3. *Rolled Products.*—Rolling mill sales were valued at $50,758,322 in 1929 as compared with $46,565,831 in 1928. During the year 1,607,063 long tons of iron and steel passed through the rolling mills and of this total 1,426,757 tons came from the producers' own plants and 180,036 tons were purchased.

The 15 rolling mills operated during 1929 were located as follows: Ontario, 7; Quebec, 4; Nova Scotia, 3; Manitoba, 1. The average number of employees in these plants in 1929 was 5,505.

Table 155.—Principal Statistics of the Primary Iron and Steel Industry in Canada, 1925-1929

Year	No. of plants	Capital employed	Average number of employees	Salaries and wages	(*) Cost of materials at works	Selling* value of products at works	Value added by manufacturing
		$	$	$	$	$	$
1925	32	82,593,940	5,101	7,201,172	16,433,911	35,337,685	18,903,774
1926	33	86,987,454	6,140	9,054,170	19,912,723	41,183,565	21,270,842
1927	36	96,295,734	7,396	11,809,198	18,993,940	45,571,264	26,577,324
1928	40	114,292,363	9,057	15,470,836	27,164,463	62,071,674	34,907,211
1929	45	109,446,529	11,218	18,534,681	32,514,596	72,231,995	39,717,399

*Figures of materials used are of purchased materials only, and production figures cover sales only.

Table 156.—Principal Statistics of the Pig Iron and Ferro-Alloys, Steel and Rolled Products Industry in Canada, by Provinces, 1928 and 1929

Province	Year	Number of plants	Capital employed	Number of employees	Salaries and wages	Cost of materials	Production	Value added by manufacturing
			$		$	$	$	$
Nova Scotia	1928	6	29,978,715	2,121	3,263,144	7,067,650	15,625,206	8,557,556
	1929	6	28,626,944	2,150	3,352,388	7,789,915	16,044,488	8,254,573
Quebec	1928	10	10,282,082	1,737	2,433,334	1,652,038	7,350,581	5,698,543
	1929	13	11,765,863	2,624	3,569,143	2,670,576	10,344,845	7,674,269
Ontario	1928	16	72,098,748	4,709	9,092,742	17,859,303	36,926,646	19,067,343
	1929	18	66,941,099	5,915	10,985,718	21,591,863	43,739,532	22,147,669
Manitoba	1928	4	1,800,911	416	579,461	559,861	1,959,241	1,399,380
	1929	4	1,884,623	435	501,832	430,804	1,811,930	1,381,126
Canada*	**1928**	**40**	**114,292,363**	**9,057**	**15,470,836**	**27,164,463**	**62,071,674**	**34,907,211**
	1929	**45**	**109,446,529**	**11,218**	**18,534,681**	**32,514,596**	**72,231,995**	**39,717,399**

*Includes data for 3 plants in British Columbia and 1 in Alberta.

Table 157.—Materials Charged to Iron Blast Furnaces in Canada, 1929

Item		Quantity	Cost at furnace
			$
Foreign iron ore	long tons	1,924,579	6,904,374
Mill cinder, scale, slags, etc.	long tons	120,779	569,655
Scrap	long tons	61,955	664,202
Limestone—			
From Canadian quarries	short tons	130,239	210,752
From foreign sources	short rons	468,793	616,283
Coke—			
From Canadian coal	short tons	406,290	2,018,109
From imported coal	short tons	680,140	3,601,018
Imported	short tons	84,741	575,738
Total			15,160,131

Table 158.—Production of Pig Iron in Canada, by Grades, 1929

Item	Total tonnage made	Tonnage shipped to companies' own plants	Sales	
			Quantity	Value
PIG IRON—	Long tons	Long tons	Long tons	$
Basic	770,478	748,415	16,645	326,296
Foundry	221,644	2,888	237,281	4,754,979
Malleable	88,038	2,586	70,833	1,463,370
Total	**1,080,160**	**753,889**	**324,759**	**6,544,645**

Table 159.—Production of Ferro-Alloys in Canada, 1920-1929.

—	Long tons	—	Long tons
1920	27,781	1925	25,709
1921	22,608	1926	57,0[illegible]0
1922	21,402	1927	56,230
1923	41,887	1928	44,482
1924	35,034	1929	89,116

Table 160.—Materials Used in the Steel Ingots and Castings Industry in Canada, 1929

Item	Unit of measure	Companies' own production	Purchased materials	
			Quantity	Cost at furnace
				$
(a) Metals:—				
Pig iron	long ton	750,464	11,414	269,083
Spiegeleisen and ferromanganese	long ton	.....	11,769	796,585
Ferrosilicon	long ton	.....	5,586	328,886
Other ferro-alloys	long ton	.....	603	133,548
Metals for making alloy steels (nickel, etc.)	long tons	.....	208	64,335
Scrap iron or steel, including old rails not intended for re-rolling	long ton	.....	454,808	5,891,000
Scrap, made in works reporting	long ton	281,467	.....	.....
Total metals		1,031,931	484,388	7,483,437
(b) Ores:—				
Crude iron ore:—				
Foreign	long ton	.....	90,301	606,919
Manganiferous ore:—				
Foreign	long ton	.....	3,769	74,764
Chrome, etc.:—				
Foreign	long ton	.....	989	29,020
Total ores	.....	.....	95,059	710,703
(c) General materials:—				
Lime-stone—Canadian	short ton	.....	46,216	83,639
Foreign	short ton	.....	108,020	154,828
Fluorspar	short ton	.....	10,299	137,547
Dolomite	short ton	.....	19,495	63,178
Coke from Canadian coal	short ton	.....	2,170	26,462
Coke made in Canada from imported coal	short ton	.....	617	7,096
Imported coke	short ton	.....	356	5,132
Anthracite coal	short ton	.....	1,151	9,737
Bituminous coal	short ton	.....	225	2,250
Charcoal	bushels	.....	114,400	28,262
Carbon electrodes	.....	.....	.....	131,651
Other materials	.....	.....	.....	423,391
Total general materials	.....	.....	.....	1,073,173
Total value of all metals, ores and general materials	.....	.....	.....	**9,267,313**

Table 161.—Products of the Steel Ingots and Castings Industry in Canada, 1929

Item	Total tonnage made	Tonnage shipped to companies' own plants	Sales	
			Quantity	Value
	Long tons	Long tons	Long tons	$
Steel Ingots:—				
Basic open hearth	1,295,162	1,288,810	1,073	31,822
Electric	14,444	14,444	.....	.....
Direct Steel Castings:—				
Basic	35,806	10,154	26,770	3,979,471
Bessemer	2,590	66	2,524	565,965
Electric	30,022	150	31,614	5,706,202
Total	**1,378,024**	**1,313,624**	**61,981**	**10,283,460**

*Production figures as given herein do not necessarily represent the total Canadian output; there may be also a small production in other industrial groups.

Table 162.—Materials used in the Rolled Iron and Steel Products Industry in Canada, 1929

Item	Companies' own make	Purchased materials	
		Quantity	Cost at mill
	Long tons	Long tons	$
Steel, crude and semi-finished (ingots, blooms, billets, slabs)	1,407,535	118,786	4,541,321
Rails, old or scrap	.....	50,269	858,863
Iron muck and scrap bar	8,940	143	25,107
Iron and steel scrap	10,282	8,882	133,310
Axles, scrap	.....	2,226	52,145
Other iron and steel	21,726	.....	.....
All other materials	.....	.....	73,879
Total	**1,448,488**	**180,306**	**5,684,625**

Table 163.—Output of the Rolled Iron and Steel Products Industry in Canada, 1929

Products	Total tonnage made*	Tonnage shipped to companies' own plants	Tonnage sold	Income from sales
	Long tons	Long tons	Long tons	$
Blooms, billets and slabs, (except for forging)	1,159,045	1,012,912	74,402	2,488,945
Rails	383,002	194	381,634	17,543,906
Structural shapes	31,304	839	31,106	1,552,835
Merchant bars, including rounds, squares, flats (6 in. and under), except flats for cold rolling and bars for reinforcing concrete	244,593	36,191	206,605	10,921,567
Bars for reinforcing concrete	59,515	3,700	60,738	3,240,317
Long angle splice bars, long fish plate bars, tie plate bars and all other long rail joint shape bars	83,552	83,552	.....	.....
Spike rods, bolt and nut rods, horseshoe bars, and all other miscellaneous rolled (not forged) forms not elsewhere specified	17,800	18,583	.....	.....
Wire rods, including chain rods	142,589	111,879	33,632	1,316,546
Finished rolled axles, and rolled blooms, billets and axle blanks for forging purposes only	27,938	4,500	18,352	1,408,477
Railway tie plates	60,191	24	59,323	3,168,851
Railway fish plates and angle splice bars	18,626	.....	18,853	1,188,486
Forgings or iron and steel	9,278	.....	9,257	919,491
Railway spikes	15,206	230	14,680	1,059,175
Washers	1,000	118	784	118,356
Scrap iron and steel	3,427	62	3,365	39,016
Other products	.....	.....	.....	5,792,354
Total	.....	.....	.....	**50,758,322**

Table 164.—World Production of Pig Iron, Steel Ingots and Castings, 1927-1929.

(In 1,000's of long tons = 2,240 lb. as reported by the Iron Trade Review.)

Country	Pig iron			Steel ingots and castings		
	1927	1928	1929	1927	1928	1929
United States	36,289	37,832	42,400	44,935	51,544	56,095
Canada	760	1,083	1,170	907	1,240	1,475
Great Britain	7,294	6,611	7,565	9,099	8,525	9,820
France	9,150	9,821	10,290	8,100	9,348	9,525
Belgium	3,692	3,843	4,035	3,645	3,872	4,105
Luxemburg	2,680	2,726	2,850	2,431	2,526	2,665
Italy	487	500	675	1,569	1,932	2,150
Spain	584	570	720	660	788	950
Sweden	448	431	500	491	567	675
Germany	12,893	11,615	13,300	16,050	14,285	16,200
Saar Territory	1,743	1,905	2,075	1,865	2,040	2,200
Austria	428	451	470	551	626	640
Czechoslovakia	1,241	1,515	1,600	1,845	2,000	2,150
Poland	607	673	710	1,226	1,414	1,420
Hungary	294	281	360	464	478	535
Russia	2,985	3,322	4,000	3,662	4,190	4,600
Japan	1,225	1,500	1,500	1,635	1,840	2,200
China	300	300	300	30	30	30
India	1,145	1,052	1,350	575	410	570
Australia	550	410	450	448	462	450
Miscellaneous	400	540	560	220	320	330
Total	**85,195**	**86,981**	**96,880**	**100,408**	**108,437**	**118,785**

Poland's figures include most of Upper Silesia. Japan's figures include Manchuria and Chosen.

Table 165.—Production of Pig Iron in Canada, by Provinces, 1924-1929

(Long tons)

Year	Nova Scotia	Ontario	Total
1924	177,078	415,971	**593,049**
1925	201,795	368,971	**570,766**
1926	250,238	507,079	**757,317**
1927	249,549	460,148	**709,697**
1928	302,756	734,971	**1,037,727**
1929	310,801	769,359	**1,080,160**

Table 166.—Production of Pig Iron in Canada, by Grades, 1924-1929

(Long tons)

Year	Basic	Foundry	Malleable	Total
1924	357,704	173,663	61,682	**593,049**
1925	409,590	101,968	59,208	**570,766**
1926	469,630	243,307	44,380	**757,317**
1927	523,701	145,787	40,209	**709,697**
1928	724,559	233,386	79,782	**1,037,727**
1929	770,478	221,644	88,038	**1,080,160**

Table 167.—Production of Pig Iron in Canada, by Months, 1926-1929

(Long tons)

Months	1926	1927	1928	1929
January	56,644	51,717	65,006	87,754
February	49,746	50,695	64,691	93,939
March	53,251	75,637	78,390	86,176
April	67,607	77,240	74,736	79,341
May	72,762	78,987	87,811	81,464
June	70,854	69,437	97,379	89,873
July	67,232	50,997	95,422	99,786
August	58,780	63,234	91,522	112,528
September	64,187	52,470	90,516	98,816
October	70,124	38,097	93,186	91,409
November	52,345	37,989	95,426	86,516
December*	73,785	63,197	103,642	72,548
Total	**757,317**	**709,697**	**1,037,727**	**1,080,160**

*Slight errors in monthly production figures have been compensated in December totals.

Table 168.—Production of Steel Ingots and Direct Steel Castings in Canada, by Kinds, 1924-1929

(Long tons)

Year	Steel ingots		Direct steel castings			Total steel ingots and castings
	Open hearth	Electric	Open hearth	Converter	Electric	
1924	634,954	.....	18,393	1,448	4,972	659,767
1925	734,277	.....	9,059	1,732	7,435	752,503
1926	744,103	.....	19,831	1,676	10,652	776,262
1927	868,440	134	17,569	2,191	19,611	907,945
1928	1,189,399	602	20,109	2,109	22,590	1,234,719
1929	1,295,162	14,444	35,806	2,590	30,022	1,378,024

Table 169.—Production of Steel Ingots and Castings in Canada, by Months, 1926-1929

(Long tons)

Month	1926	1927	1928	1929
January	68,536	58,551	84,295	116,260
February	53,157	55,620	98,820	117,445
March	58,765	107,381	118,258	137,158
April	79,936	109,107	112,780	122,102
May	89,513	96,711	117,655	126,372
June	81,277	59,940	116,530	119,505
July	64,847	55,250	82,807	129,827
August	45,674	77,479	88,677	120,282
September	58,837	54,250	99,888	99,000
October	63,542	56,371	108,987	115,674
November	54,311	80,730	108,463	93,648
December*	57,867	96,555	97,559	80,751
Total	**776,262**	**907,945**	**1,234,719**	**1,378,024**

*Slight errors in monthly production figures have been compensated in December totals.

MANGANESE

No manganese ore or pyrolusite has been produced in Canada since 1924 when 584 tons of ore valued at $4,088 were produced in the province of New Brunswick. Deposits of manganese are also known to occur in Lunenburg county, Nova Scotia, and in British Columbia near the town of Kaslo.

The importance of manganese in the manufacture of iron and steel is steadily increasing. A large part of the consumption is in the manufacture of manganese-iron alloys (spiegeleisen and ferromanganese) for the manufacture of special steels.

The greatest deposits and the chief sources of manganese up to the present time are in Russia (Caucasus), Southern and Central India and East Central Brazil. It also occurs in commercial quantities in several countries of Europe, Canada, the United States, Mexico, and in Queensland, Australia.

Table 170.—Production of Manganese Ore in Canada, 1886-1929

Year	Tons	Value	Year	Tons	Value	Year	Tons	Value
		$			$			$
1886	1,789	41,499	1900	30	1,800	1913	.....	.....
1887	1,245	43,658				1914	28	1,120
1888	1,801	47,944	1901	440	4,820	1915	201	9,360
1889	1,455	32,737	1902*	172	4,062			
1890	1,328	32,550	1903	91	2,775	1916	957	89,544
			1904	66	2,740	1917	158	14,836
1891	255	6,694	1905*	22	1,720	1918	440	6,230
1892	115	10,250				1919	661	14,159
1893	213	14,578	1906*	93	925	1920	649	11,029
1894	74	4,180	1907*	1	22			
1895	125	8,464	1908	.....	.....	1921	68	3,400
			1909	.....	.....	1922	73	2,044
1896*	124	3,975	1910	.....	.....	1923	200	1,400
1897*	15	1,166				1924	584	4,088
1898	50	1,600	1911	6	300	1925-29	.....	.....
1899	1,581	20,004	1912	75	1,875			
						Total	**15,185**	**447,548**

*Exports.

Table 171.—World Production of Manganese Ore, 1925-1929

(Short tons)

(From the Mineral Industry of the British Empire—Imperial Institute)

Producing country	1925	1926	1927	1928	1929
British Empire					
United Kingdom	928	143	1,600	263	.....
Gold Coast (exports)	400,025	446,377	413,510	363,439	457,211
Northern Rhodesia	.....	.....	777	2,007	2,071
Union of South Africa	520	920	1,432	.....	10,306
Cyprus	.....	.....	18	.....	.....
Canada, (bog ore)	.....	.....	.....	385	309
India	940,196	1,136,719	1,264,875	1,095,863	113,5[illegible]
Australia	1,304	1,559	1,668	187	261
Total	**1,342,880**	**1,585,920**	**1,680,000**	**1,456,000**	**1,568,000**
Foreign Countries					
Austria(c)	23,576	25,668	36,328	43,611	43,049
Bulgaria	623	540	8	.....	.....
Czechoslovakia	85,958	104,910	119,464	109,611	(a)
France	4,412	3,963	6,162	3,426	1,200
Germany	159	28	34	232	523
Greece	4,743	6,998	8,910	1,191	(a)
Hungary	6,924	10,920	19,040	24,435	20,992
Italy	16,517	15,444	10,753	11,325	10,528
Jugoslavia	2,994	1,371	2,173	2,932	4,955
Portugal	8	.....	541	.....	.....
Rumania	5,917	9,208	11,430	34,466	38,623
Russia (years ended Sept. 30)—					
Nikopol—					
Crude ore	416,308	949,710	1,013,792	.....	.....
Washed ore	193,534	527,256	520,453	809,552	1,344,000
Tchiaturi—(b)					
Crude ore	479,306	849,597	704,611	.....	.....
Washed ore	367,861	483,288	409,403	(d)	(d)
Urals—					
Crude ore	3,342	8,090	2,465	(a)	(a)
Spain	39,762	49,545	40,643	15,107	18,256
Sweden	12,060	16,819	18,544	17,406	25,760
Egypt	88,834	134,336	168,843	151,570	211,067
Morocco (French Zone)	747	336	2,869	2,568	(a)
Tunis	1,906	1,576	2,267	2,800	125
Cuba (exports)	26,181	27,167	143,028	95,982	(a)
Porto Rico (exports)	4,695	1,587	1,819	1,706	(a)
Mexico	3,674	3,637	861	(a)	(a)
United States (e)	110,123	51,809	50,110	52,483	67,621
Argentina	.....	.....	253	155	(a)
Brazil	359,896	282,149	266,564	352,547	323,327
Chile	12,193	(a)	8,475	10,132	3,378
China (exports)	47,686	46,804	51,091	47,766	46,165
Japan	13,272	16,765	30,380	19,503	(a)
Dutch East Indies	11,050	13,177	16,494	26,954	(a)
Portuguese India	.....	.....	2,661	4,590	(a)
New Caledonia	.....	.....	143	(a)	(a)
Turkey	.....	.....	.....	56	166
Algeria (exports)	496	636	.....	.....	.....
Total	**1,792,000**	**2,688,000**	**1,904,000**	**1,792,000**	**2,464,000**
World's Total	**3,136,000**	**4,256,000**	**3,584,000**	**3,248,000**	**4,032,000**

(a) Information not available.
(b) Includes 20,220 long tons in 1926–27 of concentrates produced from waste dumps.
(c) Manganese content of manganese ore and manganiferous iron ore.
(d) Included with nikopol.
(e) Shipments, excluding ore containing 10–35 per cent Mn. which is included with iron ore.

MERCURY

During 1926 a small amount of mercury was recovered from a property on the north shore of Kamloops lake, B.C. In 1895, 1896 and 1897 a small production was derived from the same district. Development work was done during 1929 on a Vancouver Island, Cinnabar Property.

Cinnabar, the principal ore of mercury is found in many countries of the world but the chief producing countries are Italy, Spain and United States in order of their importance. Mercury is used in the amalgamation of gold and silver and as a fulminate in the making of detonators. It also enters largely into the manufacture of drugs, and vermilion (mercuric sulphide) the well-known red pigment. Its increased use in the United States is due to the greater consumption in electrical apparatus such as radios, meters, and storage batteries.

Table 172.—Production of Mercury in Canada, 1895-1929

Year	Flasks	Price per flask	Value
		$	$
1895	71	33·00	2,343
1896	58	33·44	1,940
1897	9	36·00	324
1898-1929	.....	.....	.....

Table 173.—Imports into Canada of Mercury, 1924-1929

Year	Pounds	Value
		$
1924	85,459	60,675
1925	146,435	118,697
1926	100,492	84,910
1927	124,099	160,330
1928	199,603	269,746
1929	346,701	478,048

Table 174.—Monthly Average Price of Mercury, 1927-1929

(At New York, per flask of 76 pounds)*

(From Engineering and Mining World)

Month	1927	1928	1929
	$	$	$
January	101·200	123·620	119·481
February	101·727	121·370	119·818
March	110·259	122·557	121·904
April	123·250	123·700	122·000
May	123·990	123·173	121·154
June	118·095	122·423	120·500
July	119·880	121·260	121·654
August	119·111	124·500	125·111
September	119·640	128·000	124·542
October	126·200	125·923	124·298
November	127·708	123·000	123·323
December	126·933	122·500	121·950
Average	**118·159**	**123·506**	**122·145**

*Prior to June, 1927, the unit was 75 pound flask.

Table 175.—World Production of Mercury, 1925-1929

(Pounds)

(From the Mineral Industry of the British Empire—Imperial Institute)

Producing Country	1925	1926	1927	1928	1929
BRITISH EMPIRE					
Canada	.....	375	.....	.....	.....
New Zealand	.....	.....	1,568	.....	.....
FOREIGN COUNTRIES					
Austria	13,514	15,598	18,739	14,550	10,041
Czechoslovakia	161,1854	181,300	121,799	158,576	(a)
Italy	4,042,340	4,124,848	4,400,426	4,383,495	4,321,600
Roumania	7,180	4,467	7,848	.....	.....
Russia (years ended Sept. 30)	21,798	279,423	163,230	224,210	(a)
Spain	2,816,046	3,514,538	5,496,121	4,839,413	(a)
Algeria	9,918	48,500	5,952	.....	22
Mexico	85,365	100,125	178,828	192,726	182,181
United States	688,050	573,150	845,700	1,358,120	1,799,850
Turkey	138,000	138,000	.....	6,600	17,925
Japan	.....	.....	.....	1,017	(a)
China (exports)	7,180	4,467	.....	.....	.....
World's Total	**8,000,000**	**9,000,000**	**11,000,000**	**11,000,000**	(a)

(a) Information not available.

MOLYBDENUM

Molybdenite deposits are known to occur in Nova Scotia, Quebec, Ontario, Manitoba and British Columbia, but the principal production has come from the Moss Mine near Quyon in Pontiac county, Quebec.

In 1926 the Moss mine at Quyon, Quebec, produced 25,168 pounds of molybdenum concentrates containing 20,943 pounds of molybdenum sulphide which, at 50 cents per pound, was worth $10,472.

The war stimulated the demand for molybdenum ores to an appreciable extent but with the cessation of hostilities, the producers were left with considerable stocks on hand for which there was no immediate market, owing to the then limited uses of the metal. The ore produced was mostly low-grade material carrying less than 2 per cent MoS_2, some rock assayed from 2 to 15 per cent MoS_2, and some higher grade hand-picked material was also produced.

Molybdenum is chiefly used in the manufacture of molybdenum steel for use in automotive construction. The principal producing countries during the last three years were the United States, Norway, Australia and Canada.

In Quebec, one property produced molybdenite during 1929; while two others, one in Quebec and one in British Columbia, were under development.

Table 176.—Production of Molybdenite in Canada, 1902-1929

Year	Ores mined	Ores treated	Ores and concentrates shipped		MoS_2 content of shipments	MoS_2 production (probable recovery)	
	Tons	Tons	Tons	Value (a) $	Pounds	Pounds	Value (b) $
1902	3	.....	3·3	400	(c)	(c)	(c)
1903	600	.....	85·0	1,275	(c)	(c)	(c)
1904-1913	.....	.....	.....	.....	.....	.....	.....
1914	166	.....	16·5	2,063	3,814	3,814	2,063
1915	2,242	216	39·0	28,920	29,210	29,210	28,450
1916	13,522	9,100	610·0	188,316	156,461	156,461	156,461
1917	26,871	22,605	1,554·3	320,006	330,316	288,705	288,705
1918	34,030	33,935	461·3	428,807	378,482	378,029	434,733
1919	7,280	6,783	46·0	69,203	83,002	83,002	69,203
1920-1923	.....	.....	.....	.....	.....	.....	.....
1924	700	668	10·0	9,370	18,739	18,739	9,307
1925	3,000	2,779	15·3	11,176	22,350	22,350	11,176
1926	4,186	4,490	12·6	10,472	20,943	20,943	10,472
1927	.....	.....	.....	.....	.....	.....	.....
1928	.....	.....	.....	.....	.....	.....	.....
1929	9,100	2,900	9·5	6,400	16,150	16,150	6,400

(a) Value as given by the operators. (b) Estimated at the average market value of molybdenite.
(c) No figures available.

Table 177.—World Production of Molybdenum, 1925-1929

(In 1,000 pounds molybdenum content)

(From *The Mineral Industry*, 1929)

Country	1925	1926	1927	1928	1929
Australia, N.S.W.	7	1	.....	.....	.....
Australia, Queensland	4	.....	1	2	.....
Australia, Victoria	39	48	.....	.....	.....
Canada	17	12	.....	.....	14
Japan	.....	.....	.....	.....	.....
Korea	.....	44	.....	.....	.....
Norway	159	154	175	255	341
Spain	.....	.....	.....	.....	.....
Sweden	.....	7	.....	.....	.....
United States	1,154	1,371	2,150	3,410	4,030
All other countries	.....	45	19	51	.....
Total	**1,380**	**1,682**	**2,345**	**3,718**	**4,385**

TIN

Tin ores have not yet been found in sufficient quantities in Canada to be of economic importance.

The occurrence of tin ore has been reported from several localities, the most important perhaps being the discovery of cassiterite, near New Ross, Lunenburg county, N.S. Reports on this occurrence may be found in the Summary Reports of the Geological Survey Branch of the Department of Mines for 1907, 1908, 1910, 1911 and 1912.

Cassiterite occurs in a few scattered crystals in pegmatite dykes in the drainage basin of McDougal creek, Lardeau division, B.C., and it has been found also in black sands in the Atlin district, B.C., and in the alluvial sands of Dublin gulch, Mayo district, Yukon.

Tin is also found in Sullivan mine ore which is primarily lead and zinc. It has been separated by the Consolidated Mining and Smelting Company, Limited, but up to the present, the work has been only experimental and there has been no commercial production of the metal from this source.

Ores of tin were formerly imported from South America and reduced in Canada by the Electro Tin Products Company at Brantford, Ontario. The plant, which consisted of roasting furnaces, electric smelting and slag-cleaning furnaces, was dismantled some years ago when competition of European smelters treating the easily-reducible tin concentrates from the Malay States, made the operation of the Canadian plant (and several in the United States) unprofitable.

Tin bearing pegmatites of the Winnipeg river area, in Manitoba, received considerable attention during 1929; an appreciable amount of exploratory work was accomplished on the more promising of these occurrences.

Table 178.—Imports into Canada of Tin, 1927-1929

—	1927		1928		1929	
	Pounds	Value	Pounds	Value	Pounds	Value
		$		$		$
Tin in blocks, pigs and bars	4,833,800	3,036,082	5,358,700	2,822,413	5,714,500	2,670,819
Tin foil	154,622	77,914	102,388	61,127	102,152	55,092
Strip waste	4,000	66	2,000	40	.....	.....
Collapsible tubes	.....	82,179	.....	44,655	.....	49,841
Dairy tin	.....	69,279	.....	74,400	.....	81,238
Tinware, etc. (a)	.....	638,105	.....	838,204	.....	870,961
Tin cans and containers	.....	673,173	.....	518,047	.....	643,075
Bichloride of tin or tin crystals	415,705	147,323	737,819	229,985	965,236	282,329
Total	.....	**4,754,421**	.....	**4,588,871**	.....	**4,654,355**

(a) Tinware, plain, japanned or lithographed, and all manufactures of tin, n.e.s.

Table 179.—World Production of Tin

(In terms of metal)

(short tons)

(From the Mineral Industry of the British Empire—Imperial Institute)

Producing Country	1925	1926	1927	1928	1929
British Empire					
United Kingdom	2,620	2,606	2 ,904	3,902	3,664
Nigeria	7,007	8,307	9,023	10,228	12,022
Southern Rhodesia	19	16	26	8	15
South West Africa	151	147	165	180	[illegible]
Swaziland	217	149	119	146	[illegible]
Tanganyika Territory	8	20	40	41	[illegible]
Uganda	.....	.....	90	208	[illegible]
Union of South Africa	1,285	1,244	1,285	1,399	[illegible]
India	1,810	2,782	2,741	2,180	[illegible]
Federated Malay States (Exports)	51,437	51,461	58,440	69,367	75,086
Unfederated Malay States	2,402	1,990	2,358	3,002	2,605
Straits Settlements	7	2	76	50	(a)
Australia	3,378	3,203	3,521	3,237	2,508
Total	**70,336**	**71,904**	**80,640**	**93,184**	**100,800**
Foreign Countries					
Portuguese East Africa	(a)	9	.....	.....	.....
Czechoslovakia	20	24	36	29	(a)
France	.....	.....	28	(a)	(a)
Portugal	672	896	784	784	560
Spain	49	53	168	241	(a)
Belgian Congo	672	1,406	977	878	1,095
French Morrocco	.....	6	6	11	(a)
Mexico	1	2	.....	2	6
United States	13	8	27	46	39
Argentina	1	3	13	28	(a)
Bolivia (exports)	36,091	33,667	40,105	46,379	51,897
China (exports of ingots)	9,520	7,616	6,966	7,876	7,591
Dutch East Indies	36,679	36,967	38,006	39,136	39,984
French Indo China	652	664	783	893	839
Japan (smelter)	431	601	749	821	(a)
Siam	9,029	8,385	8,494	8,481	11,779
Total	**94,080**	**90,720**	**97,440**	**105,280**	**115,360**
World Total	**164,640**	**162,400**	**178,080**	**198,240**	**216,160**

(a) Information not available.

TUNGSTEN

Tungsten ores are found in several very widely separated districts in the Dominion, notably, in the provinces of Nova Scotia, New Brunswick, Manitoba and British Columbia. Deposits in Nova Scotia and New Brunswick are the most important. In 1929 some intensive prospecting was done at the Indian Path mine, Lunenburg county, Nova Scotia.

The only important productions (1) of tungsten ore in Canada reported, are the following:

In 1912 there was a shipment of 14 tons of concentrates produced by the Scheelite Mines, Ltd., of Moose River, N.S.

In 1917 a small test shipment of a few hundred pounds was made from Halifax county, N.S., and another from Dublin gulch, Mayo district, Y.T., amounting in all to 580 pounds, running 69·41 per cent WO_3 and netting $234.

The production in 1918 amounted to $13\frac{1}{2}$ tons valued at $11,700 and with a metallic content of 19,915 pounds of WO_3. This production consisted of 11 tons of concentrates shipped to New York by the Acadia Tungsten Mines, Limited, operating at Burnt Hill, N.B., and a few small consignments to the Mines Branch testing plant, Ottawa, from Nova Scotia, Manitoba, and the Mayo district, Yukon.

China is the world's greatest producer of tungsten and in 1929 the production from that country amounted to about 50 per cent of the world's output of tungsten ores. Practically the entire Chinese output was exported to Germany, the United States, Great Britain, Belgium, France and other countries. One of the recent and more important uses of tungsten is in the making of tungsten-carbide machine tools.

(1) Mines Branch report, 1920.

Table 180.—World Production of Tungsten (a) 1925-1929

(Metric tons; 60 per cent WO_3 concentrates)

(The Mineral Industry, 1929)

Country	1925	1926	1927	1928	1929
NORTH AMERICA—					
United States	1,080	1,254	1,056	1,096	2,300
Mexico	*25	*25	*25	*25	*45
SOUTH AMERICA—					
Argentina	4	*11	*10	24	*120
Bolivia	75	109	*79	29	*585
Peru	5	18	.....	.....	*100
EUROPE—					
England	2	20	*35	96	*135
France	150	*119	*100	5	14
Portugal	207	240	*179	500	*700
Saxony-Bohemia	221	*140	*50	80	*120
Spain	73	*148	*197	158	350
ASIA—					
Burma	850	1,900	1,277	1,760	*2,200
China	7,000	8,000	*5,666	8,283	*6,500
Federated Malay States	171	163	24	30	25
Unfederated Malay States	251	234	*170	139	150
French Indo-China	189	170	*200	211	238
Japan and colonies	15	18	45	165	*283
Siam	10	10	8	*20	*35
AUSTRALASIA—					
New South Wales	7	.....	.....	.....	*68
New Zealand	2	9	7	6	*25
Northern Territory	.....	.....	.....	.....	.....
Queensland	5	1	3	29	*45
Tasmania	207	91	*176	209	*380
Total	**10,549**	**12,671**	**9,307**	**12,000**	**13,500**

(a) Statistics reported by F. L. Hess and L. M. Jones of the United States Bureau of Mines and by foreign governments.
*Preliminary estimate.

CHAPTER SIX

The Non-Ferrous Smelting and Refining Industry in Canada

Co-incident with the expansion in the mining of ores bearing non-ferrous metals, there has been a notable increase in the smelting and refining of such ores in Canada. Abundant water power, advantageously distributed throughout the Dominion, has made possible the generation of electric energy at such a low cost that the use of electrochemical or electrothermic processes has been adopted in many new fields. Among these may be noted the smelting of bauxite ores and the production of aluminium in various forms in Quebec, the refining of nickel and copper in central Ontario, the manufacture of electrolytic lead and zinc in British Columbia. Electric furnaces are also used in the manufacture of abrasives and ferro-alloys, and, in a small way, in the treatment of iron and steel.

As a source of power, electric energy is being used to an increasing extent in the mining and milling fields and important economies in operation are being effected.

In the treatment of ores, the mining and milling are so closely associated, that it is impossible to make a separation of the statistics in these two operations. There is less difficulty in drawing a line between mining and milling on the one hand, and smelting and refining on the other. This chapter is devoted to a consideration of the smelting and refining industry in Canada treating the ores of the non-ferrous metals.

The 10 plants operated by the 7 companies included in this group in 1929 were as follows:—1 plant at Arvida and 1 plant at Shawinigan Falls, Quebec, both operated by the Aluminum Company of Canada, Limited; the smelter at Rouyn, Quebec, operated by the Horne Copper Corporation; the smelter at Coniston, Ontario, the smelter at Copper Cliff and the refinery at Port Colborne, Ontario, operated by the International Nickel Company of Canada, Limited; the smelter and hydrometallurgical works of the Deloro Smelting and Refining Company at Deloro, Ontario; the smelter of the Kingdon Mining, Smelting and Manufacturing Company Limited, near Galetta, Ontario; the smelter, lead refinery, zinc refinery, precious metals refinery and copper refinery of the Consolidated Mining and Smelting Company at Tadanac, near Trail, B.C.; and the smelter of the Granby Consolidated Mining, Smelting and Power Company, Limited, at Anyox, B.C.

In Quebec the Aluminum Company of Canada operated their new plant at Arvida steadily throughout the year on the production of aluminium. Smelting of alumina imported from the United States has been carried on at Shawinigan Falls for many years and the construction of the new plant at Arvida by the same company places the province of Quebec in an enviable position as a producer of aluminium metal in its various forms.

In the Horne Copper Corporation, Quebec has another industrial enterprise that has attracted much attention since its formation. Smelter construction, which was commenced early in 1926, was completed and the smelter put in operation on December 16, 1927; treatment of customs ores from the mines of the district are adding to the smelter output.

Ontario has 4 smelters and 1 refinery in operation. The International Nickel Company Limited, operates a smelter at Coniston, Ontario, producing a matte that is shipped to the refinery operated by the same company at Clydach, Wales, where nickel metal, copper sulphate, gold, silver, and the metals of the platinum group are produced. The International Nickel Company also mines and smelts nickel-copper ore at Copper Cliff, Ontario, producing a nickel-copper matte, part of which is shipped to Huntington, West Virginia, U.S.A., where it is made into the alloy known as monel metal, and the remainder is shipped to the company's refinery at Port Colborne, Ontario, where refined and electrolytic nickel, converter copper and sponge platinum are made. The Deloro Smelting and Refining Company of Deloro, Ontario, treats ores from the districts of Cobalt, South Lorrain and Gowganda and produces refined silver, cobalt metal, cobalt oxides, nickel oxides and salts, white arsenic, bismuth metal, various insec-

ticides and stellite, an alloy of cobalt, chromium and tungsten used chiefly as a metal cutting tool. The Kingdon Mining, Smelting and Manufacturing Company operates a lead mine, mill and small smelter or Scotch hearth at Galetta, Ontario. As the general statistics given by the last named company were not separated by departments and as mining and milling predominate in this enterprise, data on capital investment, salaries, wages, etc., for this property have been combined with the statistics on silver-lead-zinc mining, but the value of the smelter production has been included with the figures for the other smelters. An estimate was made of the value of the ores smelted and this figure was included in the totals for the silver-lead-zinc mining section, so that the proper adjustments have been made to ensure the comprehensive treatment of mine and smelter statistics.

British Columbia is the only other province in the Dominion in which there are non-ferrous smelting plants in operation. In this province there are 2, one operated by the Consolidated Mining and Smelting Company at Trail, and the other by the Granby Consolidated Mining, Smelting and Power Company, Limited, at Anyox. The smelter at Trail is the largest non-ferrous metallurgical works in the British Empire. There facilities are provided for the treatment of lead ore and concentrates, zinc ore and concentrates, copper and gold ore and concentrates. This smelter purchases practically all the smelting ore mined in southern British Columbia but its main source of supply is from the famous Sullivan zinc-lead mine at Kimberley, B.C., which mine is owned by the company. The products are, fine gold, fine silver, refined copper, refined lead, refined zinc, cadmium, copper sulphate, and small amounts of platinum and palladium. Each year new demands have been made on the capacity of the smelter, which have been met so readily that very little smelting material within reasonable hauling distance is now sent elsewhere. This company also operates a concentrator to which mining companies that have no mill may send their ore. In the northern part of the province, at Anyox, there is the copper smelter of the Granby Consolidated Mining, Smelting and Power Company Limited, which treats the ore from its own mines, the Hidden Creek and Bonanza, some custom work is also done. The copper matte made at Anyox was shipped to the United States for refining.

More important events in this and associated Canadian industries during 1929 include the commencement of construction on a new and much larger smelter at Copper Cliff, Ontario, by the International Nickel Company; the erection of an electrloytic copper refinery at the same place by the Ontario Refining Company, and the beginning of work on the new triple superphosphate plant of the Consolidated Mining and Smelting Company at Trail, British Columbia.

Table 181.—Ores, Concentrates and Residues Smelted and Value of Smelter and Refinery Products in the Non-Ferrous Smelting and Refining Industry, 1928 and 1929

—	1928	1929
	$	$
Materials used—		
Ores, concentrates, residues, etc. (estimated value)	33,261,225	41,416,446
Products made—		
Gold, silver, blister copper, refined copper, lead, zinc, nickel, nickel-copper matte, nickel oxide, nickel salts, cobalt, cobalt oxide, speiss residues, aluminium, base bullion, cadmium and bismuth	94,341,702	109,854,468

Table 182.—Capital Employed in the Non-Ferrous Smelting and Refining Industry in Canada, 1928 and 1929

—	1928	1929
	$	$
CAPITAL EMPLOYED AS REPRESENTED BY—		
Lands, buildings, plants, machinery and tools	70,356,321	94,587,504
Materials on hand, supplies, finished products, ore in storage	22,464,571	21,922,933
Cash, trading and operating accounts, bills receivable	27,214,850	30,188,648
Total	120,035,742	146,699,085

Table 183.—Employees, Salaries and Wages in the Non-Ferrous Smelting and Refining Industry in Canada, 1928 and 1929

—	1928			1929		
	Number of employees		Salaries and wages	Number of employees		Salaries and wages
			$			$
Salaried Employees—						
Total	612	73	1,635,580	Male Female	621 63	1,753,846
Wage-Earners—						
January	6,188	29	10,593,158	6,908		12,018,553
February	6,289	29		6,974		
March	6,652	29		6,875		
April	6,478	29		7,046		
May	6,805	29		7,263		
June	6,981	29		7,446		
July	6,874	29		7,717		
August	6,893	30		7,637		
September	6,917	41		7,475		
October	6,841	43		7,931		
November	6,842	41		8,005		
December	6,801	41		7,777		
*Average	6,804	37	.....	7,435		.....
Total	**7,416**	**110**	**12,228,738**	8,119		**13,772,393**

*See note page 37.

CHAPTER SEVEN

THE COAL MINING, COKE, NATURAL GAS, PEAT AND PETROLEUM INDUSTRIES (Fuels) IN CANADA

The Coal Mining Industry in Canada.....
1. General Review.....
2. Commodity Statistics on Coal—including Tables on Output, Disposition, Shipments, Tonnage Lost, Imports into Canada and Exports, Consumption and World Output.....
The Coke and Gas Industry in Canada.....
The Peat Industry in Canada.....
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, peat and petroleum industries. This survey presents information in detail regarding these industries as a whole, dealing principally with the mineral industry although supplementary data are shown for closely allied manufacturing operations.

THE COAL MINING INDUSTRY

Canada's coal output of 17,496,557 tons in 1929 has only been exceeded by the record production of 1928. The 1929 output was 0·4 per cent lower than the total for the preceding year but 11·8 per cent higher than the average for the past five years. An increase of 4·6 per cent was recorded in the Nova Scotia output, 5·3 per cent in New Brunswick; and 23·0 per cent in Saskatchewan. Alberta's production was 2·5 per cent lower than the high mark for the province of 7,336,330 tons which was set up in 1928. British Columbia's output of 2,490,378 tons showed a decrease of 11·2 per cent.

Nova Scotia, New Brunswick, British Columbia, and the Yukon produce only bituminous coal; Saskatchewan mines yield lignite only; Alberta produces bituminous, sub-bituminous and lignite, and formerly also mined some anthracite but the only anthracite mine has been closed down since 1923.

Railroads in Canada consumed 5·2 million tons of Canadian coal in 1929; this tonnage represented 32·9 per cent of the total shipments from the mines. Quebec provided the largest market for Canadian coal during 1929. Exclusive of coal for the use of railroads, 2,372,541 tons of Canadian coal were shipped to Quebec points.

Lack of orders, mine disability, car shortage, absenteeism and other miscellaneous causes were responsible for the loss in output of 5,076,019 tons by the Canadian coal mines operating in 1929. It is also estimated that labour disputes at the coal mines in 1929, involving 3,045 men with a consequent loss in working time of 15,805 man-days, were the cause of a further loss of 38,880 tons.

Exports of Canadian coal in 1929 amounted to 842,972 tons, a decrease of 2·43 per cent from the 1928 total of 863,941 tons. Coal cleared through Nova Scotia and British Columbia ports accounted for 96 per cent of the Canadian exports. The United States and Newfoundland provided the principal markets for Canada's external shipments of coal.

The imports of anthracite, bituminous and lignite coal into Canada in 1929 were recorded at 18,619,300 tons as compared with 17,714,296 tons in the preceding year. Receipts from Great Britain consisted of 729,458 tons of anthracite and 115,368 tons of bituminous, making a total of 844,826 tons, an increase of 25·98 per cent over the 1928 imports of 670,612 tons. The principal supply of coal imported into Canada came from the United States, this tonnage was made up of 14,469,831 tons of bituminous, 3,173,043 tons of anthracite and 14,108 tons of lignite.

Shipments of anthracite coal from Russia to Canadian points commenced in December, 1928, and during the calendar year 1929, the tonnage received assumed important proportions amounting to 117,304 tons. Small quantities of coal were also received from Newfoundland and Japan.

The coal mining industry furnished employment to 29,739 employees during 1929. In Eastern Canada steady employment was afforded the 13,929 men working in or about the coal mines; in Western Canada the usual number seasonal decline was apparent. Salaries and wages paid in this industry amounted to $42,376,378 as against $43,320,811 in 1928. There were 28,227 wage-earners working in the coal mines of Canada in 1929; of these 6,323 worked on the surface and 21,904 underground. An average of 275 days' work was furnished surface men while underground men worked 246 days.

Records for the industry show 7,117,692 man-days work done during the year and from this total it has been computed that the average daily earning power per man was $5.49. Calculated on the same basis, the average in 1928 was $5.57 and in 1927 it was $5,03.

Capital employed by the companies operating in the coal mining industry in Canada in 1929 was $141,766,727. The value of fuel used in the operation of Canadian coal mines in 1929 was $3,087,105 and consisted principally of bituminous, sub-bituminous and lignite coal, although small quantities of gasoline, kerosene and wood were also used. Electricity purchased amounted to 40,326,458 k.w.h. valued at $570,250, in addition to which 108,944,704 k.w.h. were generated by the operating companies for their own use. A further quantity of 6,554,222 k.w.h. was produced and sold for use apart from coal mining operations.

Canadian domestic and industrial consumers used large quantities of coke, manufactured and natural gas, fuel oil and electricity, in addition to the 35·27 million tons of coal consumed in 1929. Coke manufactured in 1929 amounted to 2,712,337 tons; sales totalled 1,183,762 tons; exports were 25,208 tons, while imports of coke were recorded to 1,226,853 tons. Coke made available for consumption during the year was 3,913,982 tons. The coal equivalent of the coke imported was 1,887,464 tons. Canadian coal used at the collieries for the manufacture of coke amounted to 115,482 tons in 1929.

Manufactured gas is used extensively for household purposes and in 1929 the sales of gas in Canada totalled 17,638,942 thousand cubic feet.

Natural gas consumed for domestic purposes amounted to approximately 16,000,000 thousand cubic feet; industrial users utilized 12,000,000 thousand cubic feet. It is calculated that the domestic consumption was sufficient to displace 640,000 tons of coal.

The Canadian consumption of fuel oil for industrial and domestic purposes continues to increase. In 1929 the total quantity of fuel oil available for consumption in Canada was 514,567,878 gallons as compared with 435,327,021 gallons in the preceding year. The Dominion Fuel Board survey of domestic fuel consumption in 1928 showed a total distribution of 34,263,000 gallons of fuel oil for domestic heating in the Canadian acute fuel area, Ontario and Quebec. This quantity indicates a possible coal displacement of 273,000 tons.

Table 184.—Capital Employed in the Coal Mines of Canada, by Provinces, as at December 15, 1928 and 1929

Province	1928				1929			
	Capital employed as represented by				Capital employed as represented by			
	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total
	$	$	$	$	$	$	$	$
Nova Scotia	47,063,302	3,184,255	6,999,893	57,247,450	46,662,239	4,560,401	4,582,887	55,805,527
New Brunswick	1,432,033	24,687	188,584	1,645,304	1,452,893	24,243	179,527	1,656,663
Saskatchewan	3,746,791	61,512	162,999	3,971,302	3,749,528	83,339	163,851	3,996,718
Alberta	47,006,422	1,113,144	8,218,333	56,337,899	47,031,532	1,072,587	7,968,965	56,073,084
British Columbia	24,593,123	703,161	2,134,586	27,430,870	21,262,840	663,795	2,105,100	24,031,735
Yukon	203,000	.....	.....	203,000	203,000	.....	.....	203,000
Canada	**124,044,671**	**5,086,759**	**17,704,395**	**146,835,825**	**120,362,032**	**6,404,365**	**15,000,330**	**141,766,727**

Table 185.—Employees, Salaries and Wages in the Coal Mines of Canada, by Provinces, 1929

Province	Average number of employees					Salaries and wages		
	Salaried employees		Wage-earners		Total	Salaries	Wages	Total
	Male	Female	Surface	Underground				
						$	$	$
Nova Scotia	513	51	2,235	10,525	13,324	1,061,401	18,785,513	19,846,914
New Brunswick	25	2	126	452	605	51,312	542,469	593,781
Saskatchewan	29	2	127	434	592	70,304	530,391	600,695
Alberta	578	35	2,449	7,085	10,147	1,476,730	13,128,467	14,605,197
British Columbia	257	20	1,385	3,406	5,068	634,202	6,094,389	6,728,591
Yukon	.....	.....	1	2	3	.....	1,200	1,200
Canada	**1,402**	**110**	**6,323**	**21,904**	**29,739**	**3,293,949**	**39,082,429**	**42,376,378**

Table 186.—Wage-Earners in the Coal Mines of Canada by Months and by Provinces, 1928 and 1929

Month and year	Nova Scotia	New Brunswick	Saskatchewan	Alberta	British Columbia	Yukon	Canada
January 1928	13,498	587	726	11,512	5,330	.....	31,653
1929	12,906	674	711	11,174	4,995	.....	30,460
February 1928	13,444	573	603	10,245	5,231	.....	30,096
1929	12,665	698	691	11,098	4,953	.....	30,105
March 1928	13,501	565	521	9,174	5,147	.....	28,908
1929	12,400	666	592	9,212	5,105	.....	27,975
April 1928	13,504	529	333	7,669	4,800	.....	26,835
1929	12,578	560	413	7,610	4,946	.....	26,107
May 1928	13,617	523	307	6,837	4,879	.....	26,163
1929	12,700	533	373	7,230	4,365	.....	25,201
June 1928	13,528	532	298	7,200	4,983	4	26,545
1929	12,824	533	368	7,707	4,285	3	25,720
July 1928	13,433	527	304	7,698	4,958	4	26,924
1929	12,629	530	375	8,053	4,370	3	25,960
August 1928	13,271	516	318	8,633	4,892	4	27,634
1929	12,559	544	391	8,689	4,445	3	26,631
September 1928	12,950	549	457	9,376	5,042	4	28,378
1929	12,850	515	614	9,902	4,871	3	28,755
October 1928	12,913	843	738	10,412	5,269	.....	30,175
1929	12,936	538	732	10,989	5,041	.....	30,236
November 1928	13,162	612	773	11,181	5,047	.....	30,775
1929	12,989	558	737	11,239	5,047	.....	30,570
December 1928	13,172	661	719	11,417	4,943	.....	30,912
1929	13,082	583	734	11,507	5,067	.....	30,973
Average 1928	**13,333**	**585**	**509**	**9,280**	**5,043**	**4**	**28,754**
1929	**12,760**	**578**	**561**	**9,534**	**4,791**	**3**	**28,227**

Table 187.—Wage-Earners Employed, Days' Work Done by Months in the Coal Mines of Canada, 1929, with Comparative Totals for 1928

Month	Number of wage-earners			Days' work done		
	Surface	Underground	Total	Surface	Underground	Total
January	6,569	23,891	30,460	154,782	489,456	644,238
February	6,543	23,562	30,105	149,289	485,257	634,546
March	6,223	21,752	27,975	136,384	417,539	553,923
April	5,967	20,140	26,107	135,720	415,070	550,790
May	5,832	19,369	25,201	136,847	424,719	561,566
June	5,943	19,777	25,720	137,669	422,374	560,043
July	6,037	19,923	25,960	136,086	412,598	548,684
August	6,229	20,402	26,631	147,470	439,168	586,638
September	6,486	22,269	28,755	147,727	447,020	594,747
October	6,705	23,531	30,236	158,323	500,444	658,767
November	6,623	23,947	30,570	147,255	470,562	617,817
December	6,704	24,269	30,973	148,724	457,209	605,933
Total for 1929	.....	.....	.....	1,736,276	5,381,416	7,117,692
Total for 1928	.....	.....	.....	1,808,183	5,358,827	7,167,010

Table 188.—Wage-Earners Employed in the Coal Mines of Canada, by Classes and by Provinces, 1929, with Comparative Totals for 1928

Classification	Province						Canada		
	Nova Scotia	New Brunswick	Saskatchewan	Alberta	British Columbia	Yukon	Surface	Underground	Total
SURFACE—									
Administration	77	14	10	92	27	.....	197	23	220
Foremen and clerks	157	15	18	217	110	.....	501	16	517
Screenmen and loaders	648	34	35	770	175	.....	1,562	100	1,662
UNDERGROUND—									
Officials	504	10	11	331	149	.....	6	999	1,005
Hand cutters and helpers	1,340	380	253	2,499	1,434	1	2	5,905	5,907
Machine cutters	1,634	4	18	414	81	.....	.....	2,151	2,151
Machine loaders and helpers	1,229	13	46	1,598	170	.....	.....	3,056	3,056
Horse haulage employees	666	1	61	649	388	1	41	1,725	1,766
Mechanical haulage employees	1,605	14	11	391	338	.....	80	2,279	2,359
Ventilation employees	299	.....	1	99	39	.....	4	434	438
Roadmakers	290	5	16	184	83	.....	10	568	578
Timbermen	835	15	7	298	196	.....	19	1,332	1,351
Pumpmen	112	2	8	46	32	.....	8	192	200
MISCELLANEOUS—									
Enginemen	202	10	10	165	76	.....	446	17	463
Firemen	147	4	14	118	58	.....	340	1	341
Machinists	192	1	3	86	68	.....	335	15	350
Carpenters and masons	108	8	7	77	90	.....	289	1	290
Other mechanics	273	2	6	111	117	.....	288	221	509
All other white employees	2,442	46	26	1,389	754	1	1,974	2,684	4,658
Japanese	.....	.....	.....	.....	53	.....	1	52	53
Chinese	.....	.....	.....	.....	341	.....	220	121	341
Indians	.....	.....	.....	.....	12	.....	.....	12	12
Total for 1929	12,760	578	561	9,534	4,791	3	6,323	21,904	28,227
Total for 1928	13,233	585	509	9,289	5,043	4	6,522	22,232	28,754

Table 189.—Output of Coal from Canadian Mines, 1785-1929

Year	Short tons	Value	Average per ton	Year	Short tons	Value	Average per ton
		$	$			$	$
1785-1866	2,863,826	4,905,462	1·71	1898	4,173,108	8,224,288	1·97
1867	631,320	1,056,725	1·67	1899	4,925,051	10,283,497	2·09
1868	623,392	1,073,061	1·72	1900	5,777,310	13,742,178	2·38
1869	687,825	1,155,282	1·68	1901	6,486,325	12,699,243	1·96
1870	752,635	1,243,139	1·65	1902	7,406,681	15,210,877	2·04
1871				1903	7,960,364	15,942,833	2·00
1872	3,033,152	5,073,331	1·67	1904	8,254,595	16,592,231	2·01
1873				1905	8,667,948	17,520,263	2·02
1874	1,063,742	1,763,423	1·66	1906	9,762,601	19,732,019	2·02
1875	1,039,974	1,747,016	1·68	1907	10,511,426	24,381,842	2·32
1876	994,762	1,720,546	1·74	1908	10,886,311	25,194,573	2·31
1877	1,036,670	1,794,415	1·73	1909	10,501,475	24,781,236	2·36
1878	1,089,744	1,941,285	1·78	1910	12,909,152	30,909,779	2·39
1879	1,126,497	2,050,639	1·82	1911	11,323,388	26,467,646	2·34
1880	1,482,714	2,657,194	1·79	1912	14,512,820	36,019,044	2·48
1811	1,537,106	2,688,821	1·75	1913	15,012,178	37,334,940	2·49
1882	1,848,148	3,248,446	1·76	1914	13,637,520	33,471,801	2·45
1883	1,818,684	3,109,635	1·71	1915	13,267,023	32,111,182	2·42
1884	1,984,959	3,593,831	1·81	1916	14,483,395	38,817,481	2·68
1885	1,920,977	3,417,807	1·78	1917	14,046,759	43,199,851	3·08
1886	2,116,653	3,739,840	1·77	1918	14,077,926	55,192,896	3·68
1887	2,429,330	4,388,206	1·81	1919*	13,919,096	55,622,670	3·99
1888	2,602,552	4,674,140	1·80	1920*	16,046,764	82,496,538	4·86
1889	2,658,303	4,894,287	1·84	1921*	15,057,493	72,451,656	4·81
1890	3,084,682	5,676,247	1·84	1922*	15,157,431	65,518,497	4·32
1891	3,577,749	7,019,425	1·96	1923*	16,990,571	72,058,986	4·24
1892	3,287,745	6,363,757	1·94	1924*	13,638,197	53,593,988	3·93
1893	3,783,499	7,359,080	1·95	1925*	13,134,968	49,261,951	3·75
1894	3,847,070	7,429,468	1·93	1926*	16,478,131	59,875,094	3·63
1895	3,478,344	6,739,153	1·94	1927*	17,426,861	61,867,463	3·55
1896	3,745,716	7,226,462	1·93	1928*	17,564,293	63,757,833	3·66
1897	3,786,107	7,303,597	1·93	1929*	17,496,557	63,065,179	3·60
				Total	457,287,622	1,354,462,246	

*For the years 1919-1929 the tonnage shown is the total output from all mines; for previous years the tonnage shown includes only sales, colliery consumption, and coal used by the operators.

Table 190.—Output and Value of Coal in Canada by Kinds and by Provinces, 1928 and 1929

(Short tons)

Province	1928			1929		
	Number of mines	Quantity	Value	Number of mines	Quantity	Value
			$			$
Nova Scotia (Bituminous)	40	6,743,504	27,427,556	36	7,056,133	28,071,956
New Brunswick (Bituminous)	15	207,738	869,104	11	218,706	909,109
Saskatchewan (Lignite)	58	471,713	831,491	58	580,189	993,226
Alberta—						
Bituminous	19	3,215,494	11,190,180	17	3,094,147	10,851,499
Sub-bituminous	20	740,496	2,076,212	19	668,702	1,908,954
Lignite	240	3,380,340	10,266,022	245	3,387,844	10,167,729
Total	279	7,336,330	23,532,414	281	7,150,693	22,928,182
British Columbia (Bituminous)	34	2,804,594	11,094,353	26	2,490,373	10,160,389
Yukon (Bituminous)	1	414	2,915	1	458	1,848
Canada—						
Bituminous	109	12,971,744	50,584,108	91	12,859,822	49,995,261
Sub-bituminous	20	740,496	2,076,212	19	668,702	1,908,954
Lignite	298	3,852,053	11,097,513	303	3,968,033	11,160,955
Total	**427**	**17,564,293**	**63,757,833**	**413**	**17,496,557**	**63,065,170**

Table 191.—Disposition of Coal from Canadian Mines, 1928 and 1929

—	1928			1929		
	Total coal	Total value	Average value per ton	Total coal	Total value	Average value per ton
		$	$		$	$
Supplied to employees for domestic consumption	191,996	643,710	3·35	204,581	707,280	3·46
Used for power purposes—						
(a) Shops	93,911	340,215	3·62	108,509	392,114	3·61
(b) Colliery boilers	844,846	2,574,641	3·05	795,663	2,379,147	2·99
(c) Companies' railroads	73,479	288,902	3·93	75,704	300,144	3·96
(d) Harbour tugs and dredges	1,432	5,761	4·02	724	2,966	4·10
Shipped—(see table 194)						
(a) Ships' bunkers	543,223			365,422		
(b) Railroads	5,296,510	59,364,965	3·71	5,210,989	58,272,606	3·68
(c) Other	10,179,749			10,247,721		
Used in making coke at colliery	103,719	368,204	3·55	115,482	409,960	3·55
Used in making briquettes	22,883	85,898	3·75	105,635	194,639	1·84
Put on bank	727,519	2,817,034	3·87	1,006,497	3,806,745	3·78
Put on waste heap	299,104	.....	.....	235,284	.....	.....
Total disposition	**18,378,371**	**66,489,240**	**3·62**	**18,472,214**	**66,465,661**	**3·60**
Lifted from bank	814,078	2,731,407	3·36	975,657	3,400,491	3·49
Total output	**17,564,293**	**63,757,833**	**3·62**	**17,496,557**	**63,065,170**	**3·60**

Table 192.—Disposition of Coal from Canadian Mines by Provinces, 1928

(Short tons)

—	Nova Scotia	New Brunswick	Saskatchewan	Alberta	British Columbia	Yukon	Canada
Supplied to employees for domestic consumption	121,551	3,305	2,916	41,856	22,368	.....	**191,996**
Coal shipped	6,157,049	195,008	429,975	6,895,221	2,341,940	289	**16,019,482**
Used under colliery boilers, etc	366,829	7,723	35,038	240,209	195,042	5	**844,846**
Used by companies' railroads	47,338	1,380	2,933	7,471	14,357	.....	**73,479**
Used for manufacture of coke at colliery	.....	.....	.....	.....	103,719	.....	**103,719**
Used in making briquettes	.....	.....	.....	22,883	.....	.....	**22,883**
Used in shops, etc	93,911	.....	.....	.....	.....	.....	**93,911**
Used by harbour tugs and dredges	1,432	.....	.....	.....	.....	.....	**1,432**
Put on bank	599,774	13,367	2,066	58,942	53,430	.....	**727,519**
Put on waste heap	19,523	55	652	121,546	157,208	120	**299,104**
Total disposition	**7,407,407**	**220,838**	**473,570**	**7,388,128**	**2,888,064**	**414**	**18,378,371**
Lifted from bank	663,903	13,100	1,807	51,798	83,470	.....	**814,078**
Total output	**6,743,504**	**207,738**	**471,713**	**7,336,330**	**2,804,594**	**414**	**17,564,293**

Table 193.—Disposition of Coal from Canadian Mines by Provinces, 1929

(Short tons)

—	Nova Scotia	New Brunswick	Saskatchewan	Alberta	British Columbia	Yukon	Canada
Supplied to employees for domestic consumption	129,840	3,400	3,779	45,490	22,059	13	**204,581**
Coal shipped	6,363,984	207,904	459,302	6,713,906	2,078,818	221	**15,824,135**
Used under colliery boilers, etc	365,492	6,294	32,100	244,139	147,635	3	**795,663**
Used by companies' railroads	48,424	1,102	4,866	7,595	13,717	.....	**75,704**
Used for manufacture of coke at colliery	.....	.....	.....	.....	115,482	.....	**115,482**
Used in making briquettes	.....	.....	79,455	26,180	.....	.....	**105,635**
Used in shops, etc	108,509	.....	.....	.....	.....	.....	**108,509**
Used by harbour tugs and dredges	724	.....	.....	.....	.....	.....	**724**
Put on bank	855,026	20,740	2,605	61,183	66,943	.....	**1,006,497**
Put on waste heap	14,844	53	614	110,179	109,373	221	**235,284**
Total disposition	**7,886,843**	**239,493**	**582,721**	**7,208,672**	**2,554,027**	**458**	**18,472,214**
Lifted from bank	830,710	20,787	2,532	57,979	63,649	.....	**975,657**
Total output	**7,056,133**	**218,706**	**580,189**	**7,150,693**	**2,490,378**	**458**	**17,496,557**

Table 194.—Shipments of Coal from Canadian Mines by Grades and Destinations, 1928 and 1929

(Short tons)

Destination	1928				1929			
	Run-of-mine	Screened	Slack	Total	Run-of-mine	Screened	Slack	Total
Prince Edward Island	5,784	71,007	1,271	78,062	3,130	77,241	2,214	82,585
Nova Scotia	346,213	610,082	680,185	1,636,480	335,851	651,042	843,299	1,830,192
New Brunswick	212,875	134,139	117,283	464,297	214,058	150,133	129,667	493,858
Quebec	66,447	1,172,220	1,143,579	2,382,246	67,591	1,137,112	1,167,838	2,372,541
Ontario	515	35,489	9,277	45,281	703	46,330	9,236	56,269
Manitoba	157,133	428,167	243,110	828,410	158,420	426,495	240,024	824,939
Saskatchewan	227,241	1,097,591	408,959	1,733,791	259,860	1,032,840	424,147	1,716,847
Alberta	256,865	562,641	593,022	1,412,528	261,088	537,838	599,652	1,398,578
British Columbia	92,470	636,044	389,368	1,117,882	46,451	724,672	252,979	1,024,102
Yukon	.....	289	.....	289	.....	221	.....	221
Total domestic shipments	1,365,543	4,747,669	3,586,054	9,699,266	1,347,152	4,783,924	3,669,056	9,800,132
Railroads	4,330,869	568,028	397,613	5,296,510	4,029,986	817,399	363,604	5,210,989
Ships' bunkers	304,536	225,300	13,387	543,223	253,946	111,476	.....	365,422
Total railroads and ships' bunkers	4,635,405	793,328	411,000	5,839,733	4,283,932	928,875	363,604	5,576,411
United States	14,636	122,602	60,237	197,475	19,592	104,618	53,764	177,974
Alaska	.....	.....	.....	.....	.....	23,891	.....	23,891
Newfoundland	5,310	262,950	7,135	275,395	9,916	234,264	540	244,720
Other places	486	7,127	.....	7,613	.....	438	.....	438
Lost at sea	.....	.....	.....	.....	.....	569	.....	569
Total external shipments	20,432	392,679	67,372	480,483	29,508	363,780	54,304	447,592
Total	**6,021,380**	**5,933,676**	**4,064,426**	**16,019,482**	**5,660,592**	**6,076,579**	**4,086,964**	**15,824,135**

Table 195.—Tonnage Lost in the Coal Mines of Canada in 1928 and 1929 Showing by Provinces the Relative Percentages Produced and Lost with an Analysis of the Percentage Lost.

Province		Per cent produced	Per cent lost	Percentage lost through				
				Absenteeism	Lack of orders	Car shortage.	Mine disability	Other causes
Nova Scotia	1928	75	25	4·8	16·0	0·0	2·8	1·4
	1929	81	19	3·8	7·3	0·0	6·5	1·4
New Brunswick	1928	88	12	0·6	6·5	0·0	0·1	4·8
	1929	79	21	0·1	9·0	0·0	0·1	11·8
Saskatchewan	1928	57	43	7·7	33·5	0·3	0·1	1·4
	1929	68	32	0·0	31·0	0·0	0·0	1·0
Alberta	1928	79	21	0·8	15·3	1·9	0·7	2·3
	1929	74	26	0·6	21·0	1·6	0·7	2·1
British Columbia	1928	88	12	1·5	8·2	1·3	0·1	0·9
	1929	81	19	0·8	15·2	1·0	0·4	1·0
Canada	1928	78	22	2·7	15·1	1·9	1·4	1·[illegible]
	1929	78	22	1·8	15·0	0·8	2·8	1·[illegible]

Table 196.—Imports of Anthracite and Bituminous Coal into Canada from Great Britain, by Grades and by Provinces, 1928-1929

(Short tons)

Destination	1928			1929		
	Anthracite		Bituminous, all grades	Anthracite		Bituminous, all grades
	Egg, nut etc.	Dust		Egg, nut, etc.	Dust	
Prince Edward Island	.....	.....	.....	2,223	.....	.....
Nova Scotia	29,314	.....	4,381	31,612	.....	21,091
New Brunswick	34,061	.....	1,083	50,798	1,911	341
Quebec	428,203	13,262	137,549	592,838	5,946	92,941
Ontario	19,407	.....	.....	44,130	.....	.....
British Columbia	2,220	.....	1,132	.....	.....	95
Canada	**513,205**	**13,262**	**144,145**	**721,601**	**7,857**	**115,368**

Table 197.—Imports of Anthracite, Bituminous and Lignite Coal into Canada from the United States by Grades and by Provinces, 1928 and 1929

(Short tons)

Destination	1928				1929			
	Anthracite		Bituminous, all grades	Lignite	Anthracite		Bituminous, all grades	Lignite
	Egg, nut, etc.	Dust			Egg, nut, etc.	Dust		
Prince Edward Island	3,765	.....	4,076	.....	4,121	836	8,982	.....
Nova Scotia	29,815	.....	27,473	.....	26,695	.....	14,153	.....
New Brunswick	37,432	2,183	49,484	.....	44,653	455	75,767	.....
Quebec	739,266	162,889	1,303,607	.....	682,533	148,763	1,242,180	.....
Ontario	2,065,158	151,993	12,318,948	.....	2,098,544	156,413	13,067,713	.....
Manitoba	8,321	1,809	97,002	.....	6,701	2,479	38,801	1,896
Saskatchewan	579	.....	2,536	60	365	.....	2,477	41
Alberta	.....	.....	1,360	.....	.....	.....	1,327	.....
British Columbia	.....	21	17,510	10,720	484	1	18,364	12,171
Yukon	.....	.....	40	.....	.....	.....	67	.....
Canada†	**2,884,336**	**318,895**	**13,822,036**	**10,780**	**2,864,096**	**308,947**	**14,469,831**	**14,108**

Table 198.—Imports and Anthracite of Bituminous Coal into Canada from Other Countries, by Provinces, 1928 and 1929

(Short tons)

Destination	Source	1928			1929		
		Anthracite		Bituminous, all grades	Anthracite		Bituminous, all grades
		Egg, nut, etc.	Dust		Egg, nut, etc.	Dust	
Nova Scotia	Russia	.....	.....	.....	5,601	.....	.....
New Brunswick	Russia	.....	.....	.....	12,697	.....	.....
Quebec	Netherlands	1,102	.....	.....	.....	.....	.....
	Belgium	1	.....	.....	.....	.....	.....
	Brit. S. Africa	328	.....	.....	.....	.....	.....
	Russia	6,204	.....	.....	99,006	.....	.....
	Newfoundland	.....	.....	2	.....	.....	76
British Columbia	Japan	.....	.....	.....	112	.....	.....
Canada	.....	**7,635**	.....	**2**	**117,416**	.....	**76**

Table 199.—Average Imports of Coal into Canada by Kinds and by Provinces for the Five Years 1925-1929

(Short tons)

Destination	Anthracite			Total bituminous	**Total all grades**
	Egg, nut, etc.	Dust	Total		
Prince Edward Island	5,521	168	5,689	8,475	**14,164**
Nova Scotia	57,889	1	57,890	61,638	**119,528**
New Brunswick	90,254	1,286	91,540	97,799	**189,339**
Quebec	1,317,302	177,222	1,494,524	1,771,059	**3,265,583**
Central Ontario	2,114,844	127,347	2,242,191	10,654,054	**12,896,245**
Head of Lakes	59,786	429	60,215	1,371,227	**1,431,442**
Total Ontario	2,174,630	127,776	2,302,406	12,025,281	**14,327,687**
Manitoba	13,987	3,529	17,516	115,538	**133,054**
Manitoba and Head of Lakes	73,773	3,958	77,731	1,486,765	**1,564,496**
Saskatchewan	519	.....	519	2,175	**2,694**
Alberta	6	.....	6	1,340	**1,346**
British Columbia	2,524	4	2,528	39,104	**41,632**
Yukon	.....	.....	.....	25	**25**
Canada	**3,662,632**	**309,986**	**3,972,618**	**14,122,434**	**18,095,052**

Table 200.—Average Imports of Coal into Central Canada by Principal Areas for the Five Years 1925-1929

(Short tons)

Destination	Anthracite			Total bituminous	Total all grades
	Egg, nut, etc.	Dust	Total		
Quebec	99,506	5,293	104,799	183,447	288,246
Montreal	1,191,547	170,237	1,361,784	1,470,366	2,832,150
Ottawa	231,361	42,391	273,752	939,493	1,213,245
Kingston	101,168	2,199	103,367	222,551	325,918
Toronto	1,509,537	79,259	1,588,796	5,095,926	6,684,722
Windsor	273,998	3,689	277,687	3,197,487	3,475,174
Total	**3,407,117**	**303,068**	**3,710,185**	**11,109,270**	**14,819,455**

Table 201.—Exports of Canadian Coal by Destination, 1927-1929

(Compiled in the *External Trade Branch*)

Destination	1927		1928		1929	
	Short tons	Value	Short tons	Value	Short tons	Value
		$		$		$
British Empire						
United Kingdom	62,163	451,451	27,390	202,252	26,605	195,958
Irish Free State	131,248	682,295	484	3,003	683	4,343
British South Africa	9,923	67,865	4,578	27,468	12,089	74,057
Bermuda	646	5,315	198	1,595	950	7,600
British Guiana	.....	.....	1,066	6,393	.....	.....
British India	157	1,413	514	4,266	.....	.....
British West Indies—						
Jamaica	575	3,536	3,017	25,040	.....	.....
Other B.W.I.	353	2,910	.....	.....	.....	.....
Gibraltar	790	4,740	3,924	23,892	1,335	8,010
Malta	.....	.....	161	1,328	.....	.....
Newfoundland	281,872	1,473,336	246,100	1,301,592	269,168	1,426,701
Sierra Leone	1,247	7,794	433	3,572	.....	.....
Australia	23,895	182,730	22,458	186,310	19,225	159,409
New Zealand	15,479	90,663	6,994	40,214	6,752	41,834
Total British Empire	528,318	2,974,048	317,317	1,826,925	336,807	1,917,912
Foreign Countries						
Argentina	.....	.....	4,046	24,276	1,066	6,396
Belgium	10,988	76,074	7,354	49,695	3,463	20,406
Brazil	.....	.....	4,046	24,276	.....	.....
China	2,155	15,192	499	4,141	4,994	41,448
Cuba	194	1,676	1,015	8,531	380	3,155
Denmark	909	5,762	513	3,163	758	4,548
Egypt	236	2,006	.....	.....	.....	.....
Finland	.....	.....	147	882	.....	.....
France	3,218	23,116	1,701	11,666	5,108	35,171
French Possessions—						
French Africa	226	1,356	1,737	10,419	.....	.....
French Oceania	637	3,758	.....	.....	.....	.....
Morocco	144	1,296	.....	.....	.....	.....
St. Pierre and Miquelon	5,291	32,380	5,742	34,831	2,248	13,746
Syria	.....	.....	333	1,998	290	1,740
Germany	10,353	71,084	5,622	36,843	2,140	12,741
Greece	2,027	12,264	3,283	20,139	1,085	8,097
Honduras	.....	.....	276	1,380	.....	.....
Iceland	.....	.....	135	814	.....	.....
Italy	18,108	113,814	8,181	50,338	3,327	22,991
Japan	6,664	47,635	5,970	38,870	.....	.....
Mexico	7,002	58,116	.....	.....	.....	.....
Netherlands	5,590	31,885	7,467	55,120	5,247	35,510
Norway	3,863	21,243	1,704	11,142	421	2,521
Poland and Danzig	.....	.....	398	2,491	371	2,489
Portugal	598	3,588	1,672	12,829	.....	.....
Russia	.....	.....	361	2,166	.....	.....
Spain	501	3,006	3,221	19,512	916	5,493
Sweden	477	2,911	680	4,080	552	3,162
Turkey	.....	.....	383	2,298	641	4,352
United States	477,362	2,163,374	455,495	2,028,482	451,516	2,080,807
Alaska	27,150	216,713	22,298	168,381	21,642	152,663
Porto Rico	.....	.....	264	1,650	.....	.....
Virgin Islands	518	3,056	.....	.....	.....	.....
Uruguay	801	5,006	2,021	12,634	.....	.....
Total foreign countries	585,012	2,916,311	546,624	2,643,074	506,165	2,457,416
Total	**1,113,330**	**5,890,359**	**863,941**	**4,469,999**	**842,972**	**4,375,328**

Table 202.—Annual Consumption of Coal in Canada, 1902-1929

Calendar year	Canadian†		Imported coal "entered for consumption"				Total	Per capita
			From U.S.A.	From Great Britain	Total*			
	Short tons	%	Short tons	Short tons	Short tons	%	Short tons	Short tons
1902	5,376,413	53·1	4,656,296	101,726	4,734,559	46·9	10,110,972	1·848
1903	6,005,735	47·3	6,520,931	184,593	6,678,450	52·7	12,684,185	2·212
1904	6,697,183	47·9	7,238,869	85,687	7,297,482	52·1	13,994,665	2·412
1905	7,032,661	49·4	7,233,738	68,500	7,215,446	50·6	14,249,107	2·341
1906	7,927,560	50·5	7,787,338	67,014	7,758,325	49·5	15,685,885	2·481
1907	8,617,352	45·0	10,588,697	54,325	10,549,503	55·0	19,166,855	2·947
1908	9,156,478	47·3	10,203,335	97,514	10,195,424	52·7	19,351,902	2·820
1909	8,913,376	47·9	9,805,253	67,671	9,711,826	52·1	18,625,202	2·682
1910	10,532,103	50·2	10,545,451	51,541	10,437,123	49·8	20,970,226	2·960
1911	9,822,749	40·5	14,510,129	48,963	14,424,949	59·5	24,247,698	3·365
1912	12,385,696	46·0	14,557,124	38,668	14,549,104	54·0	26,934,800	3·657
1913	13,450,158	42·6	18,145,769	37,825	18,132,387	57·4	31,582,545	4·196
1914	12,214,403	45·5	14,687,853	33,101	14,637,920	54·5	26,852,323	3·490
1915	11,500,480	48·1	12,450,796	15,098	12,406,212	51·9	23,906,692	3·041
1916	12,348,036	41·3	17,576,202	4,401	17,517,820	58·7	29,865,856	3·717
1917	12,313,603	37·2	20,848,009	9,451	20,810,132	62·8	33,123,735	4·049
1918	13,160,731	37·8	21,674,826	3,761	21,611,101	62·2	34,771,832	4·175
1919	11,611,168	40·3	17,292,913	344	17,236,269	59·7	28,847,437	3·402
1920	14,025,566	42·9	18,752,981	.....	18,668,741	57·1	32,694,307	3·788
1921	12,715,734	41·1	18,300,081	1,591	18,258,387	58·9	30,974,121	3·524
1922	13,044,352	50·2	12,255,555	765,980	12,962,189	49·8	26,006,541	2·909
1923	15,070,962	41·8	20,417,239	572,570	20,967,971	58·2	36,038,933	3·968
1924	12,529,358	42·8	16,405,344	317,112	16,714,143	57·2	29,243,501	3·100
1925	12,125,290	42·6	15,744,957	604,117	16,331,971	57·4	28,457,261	3·039
1926	15,449,831	48·3	16,204,405	287,299	16,565,555	51·7	32,015,386	3·329
1927	16,313,531	46·6	17,769,963	907,220	18,680,832	53·4	34,994,363	3·676
1928	16,700,352	49·3	16,515,149	682,755	17,200,043	50·7	33,900,395	3·510
1929	16,653,585	47·8	17,243,047	843,502	18,186,727	52·2	34,840,312	3·556

†The sum of Canadian coal mine sales, colliery consumption, coal supplied to employees, and coal used in making coke, etc., less the tonnage of coal exported.

*Includes small tonnages from countries other than Great Britain and United States. Deductions have been made to take account of foreign coal re-exported from Canada.

Table 203.—Summary Statistics for 1929-Output, Exports, Interprovincial Shipments, Imports and Coal made Available for Consumption in Canada, by Provinces

(Short tons)

Province	Canadian coal				Imported from U.S.A.	Imported from Great Britain	Imported from other countries	Coal available for consumption
	Output	Received from other provinces	Shipped to other provinces	Exported				
Prince Edward Island—								
Anthracite	.....	.....	.....	.....	4,957	2,223	.....	7,180
Bituminous	.....	82,585	.....	.....	8,982	.....	.....	91,567
Total	.....	82,585	.....	.....	13,939	2,223	.....	98,747
Nova Scotia—								
Anthracite	.....	.....	.....	.....	26,695	31,612	(a) 5,601	63,908
Bituminous	7,056,133	.....	2,889,053	351,176	14,153	21,991	.....	3,852,048
Total	7,056,133	.....	2,889,053	351,176	40,848	53,603	5,601	3,915,956
New Brunswick—								
Anthracite	.....	.....	.....	.....	45,108	52,709	(a) 12,697	110,514
Bituminous	218,706	427,236	295	20,609	75,767	341	.....	701,146
Total	218,706	427,236	295	20,609	120,875	53,050	12,697	811,660
Quebec—								
Anthracite	.....	.....	.....	.....	831,296	508,784	(a) 99,006	1,529,086
Bituminous	.....	2,372,541	.....	130	1,242,180	92,941	(b) 76	3,707,608
Total	.....	2,372,541	.....	130	2,073,476	691,725	99,082	5,236,694
Central Ontario—								
Anthracite	.....	.....	.....	.....	2,202,236	44,130	.....	2,246,366
Bituminous	.....	.....	.....	110	11,332,168	.....	.....	11,332,058
Sub-bituminous	.....	*10,195	.....	.....	.....	.....	.....	10,195
Lignite	.....	*46,074	.....	36	.....	.....	.....	46,038
Total	.....	56,269	.....	146	13,534,404	44,130	.....	13,634,657
Manitoba and Head of Lakes—								
Anthracite	.....	.....	.....	.....	61,901	.....	.....	61,901
Bituminous	.....	46,804	.....	397	1,774,346	.....	.....	1,820,753
Sub-bituminous	.....	91,867	.....	.....	.....	.....	.....	91,867
Lignite	.....	686,268	.....	2,937	1,896	.....	.....	685,227
Total	.....	824,939	.....	3,334	1,838,143	.....	.....	2,659,748
Saskatchewan—								
Anthracite	.....	.....	.....	.....	365	.....	.....	365
Bituminous	.....	150,612	.....	76	2,477	.....	.....	153,013
Sub-bituminous	.....	74,560	.....	.....	.....	.....	.....	74,560
Lignite	580,189	1,300,783	231,858	8,151	41	.....	.....	1,641,004
Total	580,189	1,525,955	231,858	8,227	2,883	.....	.....	1,868,942
Alberta—								
Bituminous	3,094,147	47,926	178,833	45	1,327	.....	.....	2,964,522
Sub-bituminous	668,702	.....	230,303	.....	.....	.....	.....	438,399
Lignite	3,387,844	.....	1,936,974	1,015	.....	.....	.....	1,449,855
Total	7,150,693	47,926	2,346,110	1,060	1,327	.....	.....	4,852,776
British Columbia—								
Anthracite	.....	.....	.....	.....	485	.....	(c) 112	597
Bituminous	2,490,378	52,402	111,925	438,286	18,364	95	.....	2,011,028
Sub-bituminous	.....	53,681	.....	.....	.....	.....	.....	53,681
Lignite	.....	135,707	.....	20,004	12,171	.....	.....	127,874
Total	2,490,378	241,790	111,925	458,290	31,020	95	112	2,193,180
Yukon—								
Bituminous	458	.....	.....	.....	67	.....	.....	525
Total	458	.....	.....	.....	67	.....	.....	525
Canada—								
Anthracite	.....	.....	.....	.....	3,173,043	729,458	117,416	4,019,917
Bituminous	12,859,822	3,180,106	3,180,106	810,829	14,469,831	115,368	76	26,634,268
Sub-bituminous	668,702	230,303	230,303	.....	.....	.....	.....	668,702
Lignite	3,968,033	2,168,832	2,168,832	32,143	14,108	.....	.....	3,949,998
Total	**17,496,557**	**5,579,241**	**5,579,241**	**842,972**	**17,656,982**	**844,826**	**117,492**	**35,272,885**

(a) Imported from Russia. (b) Imported from Newfoundland. (c) Imported from Japan.
*Includes all coal shipped to any point in Ontario from western mines.

Table 204.—World Production of Coal* 1925-1929

(Including brown coal)

(Long tons)

Country	1925	1926	1927	1928	1929
British Empire					
Great Britain—					
Anthracite	6,126,389	2,876,655	6,346,890	5,521,570	6,364,036
Bituminous	237,049,842	123,401,866	244,885,446	231,950,361	251,542,766
Lignite	.....	.....	502	640	322
Nigeria (b)	238,966	324,575	357,899	359,316	344,937
Southern Rhodesia	678,320	860,338	894,396	1,077,557	1,020,443
Union of South Africa	12,127,188	12,745,492	12,381,692	12,407,539	12,812,790
Canada—					
Bituminous	7,981,792	11,065,249	11,613,389	11,580,241	11,481,989
Sub-bituminous	509,513	437,204	532,281	661,157	597,055
Lignite	3,236,345	3,210,104	3,414,027	3,432,078	3,542,887
British Borneo—					
State of North Borneo	79,943	71,434	62,701	60,779	†
Sarawak	19,678	19,683	16,445	17,679	13,610
Federated Malay States	408,084	464,284	463,001	556,590	661,514
India—					
Gondwana Coalfields	20,447,898	20,583,202	21,664,488	22,153,314	23,418,734
Tertiary Coalfields	456,479	415,965	417,848	389,558	
Australia—					
Bituminous	13,626,777	13,250,000	13,522,960	11,839,780	10,365,319
Lignite	876,468	957,935	1,455,482	1,591,858	1,741,176
New Zealand—					
Bituminous	1,044,726	1,196,388	1,290,529	1,348,732	1,367,164
Brown coal	911,425	905,825	954,436	973,238	1,049,603
Lignite	158,844	137,786	121,775	114,783	119,097
Total	306,000,000	193,000,000	320,000,000	306,000,000	327,000,000
Foreign Countries					
Austria—					
Bituminous	142,907	154,824	172,828	198,906	204,735
Brown coal	2,985,470	2,911,015	3,015,675	3,211,042	3,469,123
Belgium—					
Anthracite and semi-anthracite	4,769,356	5,247,611	5,899,589	6,035,006	26,506,145
Bituminous	17,962,898	19,613,048	21,216,242	21,107,733	
Bulgaria—					
Anthracite	.....			1,183	
Bituminous	71,827	1,186,713	1,218,099	67,255	1,643,000
Brown coal	1,131,353			1,339,298	
Czechoslovakia—					
Bituminous	12,360,640	13,953,092	13,794,932	14,330,345	16,485,750
Brown coal	18,310,843	18,223,237	19,310,756	20,128,419	21,155,637
France—					
Saar	12,784,692	13,464,803	13,391,097	12,899,716	13,364,882
Other districts—					
Anthracite and bituminous	46,353,460	50,579,865	50,960,760	50,554,526	52,887,804
Lignite	977,663	1,044,363	1,050,434	1,046,891	1,168,653
Germany—					
Bituminous	130,527,542	143,000,979	151,173,466	148,477,965	160,855,794
Brown coal	137,517,857	136,952,867	148,126,913	162,972,863	172,411,240
Greece—					
Brown coal	139,832	150,899	141,082	118,734	†
Hungary—					
Bituminous	776,943	813,846	773,447	770,908	813,220
Brown coal	5,417,385	5,581,158	5,983,940	6,240,930	6,659,925
Lignite	.....	169,185	160,839	164,838	272,765
Italy—					
Anthracite	14,076	15,460	16,573	10,321	
Bituminous	171,468	190,495	149,293	115,590	945,000
Brown coal	1,088,015	1,162,684	898,047	686,024	
Jugoslavia—					
Bituminous	175,638	187,800	283,184	351,826	435,131
Brown coal	2,591,589	2,965,800	3,433,470	3,608,130	4,326,603
Lignite	959,027	921,754	954,586	1,012,136	1,036,945
Netherlands—					
Bituminous	6,740,404	8,471,616	9,175,868	10,525,314	11,398,293
Brown coal	204,344	207,858	198,201	193,589	154,095
Poland—					
Bituminous	28,622,028	35,182,768	37,482,601	39,974,905	45,685,654
Brown coal	64,638	74,825	77,225	72,398	
Portugal—					
Anthracite	133,306	197,353		195,705	175,864
Bituminous	.....	.....	201,127	2,460	18,098
Brown coal	17,716	34,306		26,031	28,880
Rumania—					
Bituminous	308,620	317,102	367,559	391,285	365,088
Brown coal	2,573,973	2,688,224	2,804,999	2,588,144	2,632,831

Table 204.—World Production of Coal* 1925-1929—Concluded

(Including brown coal)

(Long tons)

Country	1925	1926	1927	1928	1929
Russia—					
Anthracite	3,292,173	5,279,743			
Bituminous—					
European	9,850,930	15,009,393	32,026,639	34,657,125	38,084,000
Asiatic	1,603,818	2,830,323			
Brown coal	1,492,943	2,256,761			
Spain—					
Anthracite	311,047	396,494	423,106	383,243	532,705
Bituminous	5,709,680	6,036,364	6,036,177	5,885,667	6,340,606
Brown coal	396,330	393,515	422,817	415,831	395,695
Spitzbergen and Bear Island	406,768 (e)	286,531	314,380	280,418	†
Sweden	259,711	377,613	392,007	352,851	388,737
Algeria	9,879	13,514	20,932	16,368	15,873
Belgian Congo	80,000	88,800	86,000	88,000	112,642
Tunis (brown coal)	.....	.....	.....	(f)	.....
Greenland	2,500	1,500	2,000	2,500	†
Mexico	1,421,684	1,288,462	1,015,020	999,787	1,043,277
United States—					
Anthracite	55,193,883	75,390,582	71,513,896	67,275,062	65,918,031
Bituminous (c)	464,332,894	511,934,807	462,288,707	447,093,723	475,314,000
Brazil	386,070	400,000	231,294	246,327	†
Chile	1,430,277	1,466,968	1,458,113	1,353,890	1,482,661
Peru	100,142	168,063	159,806	175,675	†
Venezuela	24,528	15,676	15,850	15,660	10,593
China (d)	21,000,000	22,000,000	23,000,000	20,000,000	†
Dutch East Indies	1,378,602	1,443,200	1,594,616	1,676,472	1,583,000
Formosa	1,677,659	1,766,169	1,772,005	1,513,000	†
French Indo-China—					
Anthracite	1,288,888	1,226,943	1,422,083	1,883,409	1,883,400
Bituminous	46,907	37,428	38,041	39,826	38,200
Brown coal	5,648	5,510	7,038	15,228	30,300
Japan—					
Semi-anthracite	88,458	128,322	141,181	163,263	
Bituminous	30,874,100	30,801,888	32,859,856	33,162,143	31,451,000
Brown coal	166,750	158,589	175,792	119,997	
Karafuto	246,657	271,463	351,407	530,961	
Korea—					
Anthracite	614,379	672,111	698,371	457,611	529,744
Bituminous				315,322	393,345
Philippine Islands	47,183	47,912	23,040	27,417	†
Turkey in Asia (f)	733,235	1,215,095	892,310	912,646	1,406,415
New Caledonia	1,300	15,000	†	16,000	†
Total	1,040,000,000	1,150,000,000	1,130,000,000	1,130,000,000	1,200,000,000
Total	**1,350,000,000**	**1,343,000,000**	**1,450,000,000**	**1,410,000,000**	**1,530,000,000**

*Data obtained from *The Mineral Industry of the British Empire and Foreign Countries.*
† Information not available.
(a) Including a small quantity of anthracite mined in the Fife and Clackmannan districts.
(b) Years ended 31st March of the year following that stated.
(c) Including brown coal.
(d) Approximate production.
(e) Exports.
(f) Eregli-Zoungouldak coal basin.

COKE AND ARTIFICIAL GAS

Canada's coke and gas industry in 1929 included the operation of 43 establishments, with a total capital investment of $94,749,062. These plants furnished employment to 3,902 employees whose earnings totalled $5,938,814.

Output of gas-house and by-product coke in Canada during 1929 totalled 2,716,142 tons, an increase of 402,015 tons over the record production in 1928 of 2,314,127 tons. By-product coke plants produced 2,410,790 tons in 1929 while only 305,352 tons were obtained from artificial gas plants. In addition, 109,516 tons of petroleum coke were recovered as a by-product of pretroleum refining.

Production of gas totalled 38,925,086 M cu. ft. of which 9,913,999 M cu. ft. were produced in gas plants and 29,011,087 M cu. ft. in by-product coke ovens. Sales of gas reached 17,649,371 M cu. ft. worth $13,316,684; most of the remaining gas was used for fuel in the reporting plants or associated metallurgical works. In addition to the output shown above, 3,140,187 M cu. ft. of still gas were made in petroleum refineries for their own use.

Imports of coke into Canada amounted to 1,226, 853 tons in 1929, an increase of 16 per cent over the 1928 total of 1,060,029 tons. Exports of by-product and gas coke totalled 16,993 tons as compared with 25,058 tons in 1928. Petroleum coke amounting to 27,922 tons was exported during 1929 as against 19,857 tons in the preceding year.

Table 205.—Materials used in the Coke and Gas Industry in Canada, 1927-1929

Materials	1927		1928		1929	
	Quantity	Value	Quantity	Value	Quantity	Value
Bituminous coal:—		$		$		$
(a) Canadian ... tons	878,029	3,076,271	909,539	3,144,963	961,391	3,308,849
(b) Foreign ... tons	1,987,280	10,816,801	2,289,660	11,074,045	2,696,168	12,676,139
Anthracite coal for gas-making ... tons	225	3,130	1,317	15,362	...	...
Coke for gas-making:—						
(a) Purchased ... tons	6,729	72,957	9,630	102,462	7,728	73,080
(b) Companies' own make ... tons	144,834	870,423	96,476	637,083	140,078	1,006,941
Oil (gas oil) for gas-making ... imp. gal.	14,548,244	1,364,546	11,898,419	1,008,226	9,364,684	787,855
Calcium carbide ... lb.	293,090	13,004	148,410	6,272	82,740	3,398
Lime ... tons	1,355	14,867	2,527	20,508	2,302	21,769
Water ...	...	7,012	...	14,734	...	34,222
Oxide or purifying materials ... tons	2,948	32,315	2,753	21,882	4,959	49,775
Sulphuric acid, 66°Bé ... lb.	28,946,000	240,978	46,366,147	325,067	54,314,786	406,462
All other materials ...	...	102,599	...	193,642	...	148,724
Total cost ...	...	**16,614,903**	...	**17,164,246**	...	**18,517,214**

Table 206.—Production in Canada, Imports and Exports of Coke and its By-Products, 1927-1929

—	1927		1928		1929	
	Quantity	Value	Quantity	Value	Quantity	Value
Coke—		$		$		$
PRODUCTION—by provinces—						
Nova Scotia and New Brunswick ... tons	417,380	2,020,953	463,003	2,189,648	499,080	2,436,683
Quebec ... tons	144,538	794,959	240,204	1,736,843	351,372	2,822,763
Ontario ... tons	1,260,355	8,542,988	1,443,512	9,332,926	1,624,884	11,112,809
Manitoba ... tons	35,641	386,071	34,641	337,446	44,597	461,504
British Columbia ... tons	168,524	1,219,241	132,677	938,848	157,648	1,113,899
Total ... tons	2,026,438	12,964,212	2,314,127	14,535,711	2,677,581	17,947,658
IMPORTS ... tons	772,235	4,742,223	1,060,029	6,102,842	1,226,853	6,659,514
EXPORTS ... tons	74,109	533,638	25,058	183,728	25,208	189,247
APPARENT CONSUMPTION ... tons	2,724,564	17,172,798	3,349,0.8	20,454,825	3,879,226	...
Other Products						
*PRODUCTION—						
Ammonium sulphate ... tons	24,708	1,030,991	28,090	1,108,744	34,140	1,296,952
Gas: (a) Sales ... M cu. ft.	14,658,495	15,653,591	15,606,609	13,933,537	17,649,371	13,316,684
(b) Used in own plants ... M cu.ft.	6,312,346	1,136,816	7,058,981	1,369,655	7,671,383	1,758,741
(c) Used in metallurgical works ... M cu.ft.	10,560,393	1,268,200	11,237,155	1,295,644	12,870,553	1,411,670
(d) Not accounted for ... M cu.ft.	1,324,935	...	1,156,175	211,327	733,779	888,122
Light oils ... imp. gal.	2,965,583	316,557	4,052,859	500,365	6,058,061	874,012
Tar and tar products ... imp. gal.	25,047,309	1,631,276	27,141,332	1,721,432	30,119,476	1,963,746
Ammonia liquor ... pound $N.H_3$	1,438,888	38,034	1,644,516	25,867	1,694,538	25,631
All other products ...	...	5,072	...	6,145	...	4,979
IMPORTS—						
Ammonium sulphate ... tons	3,181	160,150	3,510	174,899	1,723	80,019
Coal tar and pitch ... gal.	3,812,637	286,307	6,003,182	438,244	6,429,566	518,878
EXPORTS—						
Ammonium sulphate ... tons	16,947	730,815	13,632	561,696	24,489	909,510
Tar and pitch ... gal.	2,914,642	277,793	3,572,781	311,031	3,069,247	140,541

*Production data include the output of the *Coke and its By-products Industry* and of the *Illuminating and Fuel Gas Industry*.

NATURAL GAS

Natural gas production in Canada continues to increase and during 1929 a new high mark was set up for the industry. Production during the year amounted to 28,378,462 thousand cubic feet valued at $9,977,124, an increase of 25·7 per cent in quantity and 15·8 per cent in value over the production in 1928 of 22,582,586 thousand cubic feet at $8,614,182. Alberta was the leading producing province with a production of 19,112,182 thousand cubic feet; Ontario came next with 8,586,475 thousand cubic feet; and New Brunswick followed with 678,456 thousand cubic feet. There was also a small production from several private wells in Manitoba. Average per thousand cubic feet were as follows: New Brunswick, 49·1 cents; Ontario, 57·8 cents; and Alberta, 24·5 cents.

New Brunswick's natural gas is obtained from wells in the Stoney Creek field near Moncton. In 1929, approximately 5,200 domestic and industrial consumers in Moncton and Hillsboro were supplied with gas from this field.

Notable features of the gas industry in Ontario during 1929 were the drilling of two large productive wells in Kent county, and the completion of a gas-producing plant at Windsor, to be used entirely as a stand-by, only operating when the supply of gas fails. This plant has a capacity of 6,000 thousand cubic feet per day. Causes contributory to the increase in natural gas production in Ontario during 1929 were threefold, first, an increase in the number of consumers, second, increased consumption by industrial users, and third, the prevailing cold weather in November and December.

The Turner Valley field, located about 35 miles southwest of Calgary, Alberta, was the principal producing field in Canada during 1929. Wet gas obtained from wells in this field is stripped of its naphtha, then the sulphur content of the gas to be piped to Calgary is removed by scrubbing. During 1929, there were over 17,400 domestic and industrial consumers of natural gas in Calgary. In addition to the Calgary consumption, considerable quantities of gas are used for drilling purposes in the Turner Valley. The total natural gas used from this field in 1929 amounted to 12,183,853 thousand cubic feet; it is estimated that an additional 45,202,400 thousand cubic feet were wasted.

Gas from the Bow Island and Foremost fields was piped to Calgary during the year under review

Consumption of natural gas in Medicine Hat amounted to 2,983,554 thousand cubic feet in 1929. The 28 wells in operation in this field supplied approximately 2,500 industrial and domestic consumers. Redcliff, 2 miles west of Medicine Hat had 8 producing wells in 1929 and 603,348 thousand cubic feet of natural gas were consumed by domestic and industrial users during the year; a glass plant and three clay products plants were the principal consumers.

Edmonton's supply of natural gas is obtained from the Viking field, located about 80 miles southeast of the city. In 1929, over 9,400 consumers in Edmonton used this gas. This field also supplied gas to approximately 600 users outside of Edmonton.

More than 300 consumers in Wainwright were supplied with gas from the Maple Leaf well in 1929. Bow Island, Suffield, and Wetaskiwin were users of gas obtained from local wells. Lethbridge and some smaller centres were furnished with gas from the Canadian Western Natural Gas Company's pipe line.

Imports of mixed gas (natural and artificial) into Canada from the United States in 1929 totalled 132,942 thousand cubic feet valued at $85,338; in the preceding year 128,004 thousand cubic feet with a value of $82,681 were imported.

The 145 firms operating in Canada during 1929 reported fixed and current assets amounting to $68,592,709. This industry provided employment to 1,953 salaried employees and wage-earners, who received a total remuneration of $2,275,147. The cost of fuel and electricity used during the year amounted to $41,590. Primary power employed in 1929 consisted of 147 units with a total manufacturers' rating of 2,555 h.p.

Table 207.—Production of Natural Gas in Canada, by Provinces, 1920-1929

(For the years 1892 to 1919 see Mineral Production of Canada, 1928)

Year	New Brunswick		Ontario		Manitoba		Alberta		Canada	
	M cu. ft.	Value	M cu. ft.	Value	M cu. ft.	Value	M cu. ft.	Value	M cu. ft.	Value
		$		$		$		$		$
1920.....	682,502	130,506	10,529,374	2,920,731	200	60	5,633,442	1,181,345	16,845,518	4,232,642
1921.....	708,743	139,375	8,422,774	3,080,130	200	60	4,945,884	1,374,599	14,077,601	4,594,164
1922.....	753,898	148,010	8,060,114	4,076,296	200	60	5,868,439	1,622,105	14,682,651	5,846,501
1923.....	640,300	126,068	8,128,413	4,066,244	200	60	7,191,670	1,692,246	15,960,583	5,884,618
1924.....	599,972	113,577	7,150,078	3,798,381	200	60	7,131,086	1,796,618	14,881,336	5,708,636
1925.....	639,235	122,394	7,143,962	3,958,006	200	60	9,119,500	2,752,545	16,902,897	6,833,005
1926.....	648,316	128,300	7,764,986	4,409,593	200	60	10,794,697	3,019,221	19,208,209	7,557,174
1927.....	630,755	124,637	7,311,215	4,331,780	200	60	13,434,621	3,586,533	21,376,791	8,043,010
1928.....	660,981	324,344	7,632,800	4,535,312	200	60	14,288,605	3,754,466	22,582,586	8,614,182
1929.....	678,456	333,002	8,586,475	4,959,695	600	180	19,112,931	4,684,247	28,378,462	9,977,124

Table 208.—Capital Employed in the Natural Gas Industry in Canada by Provinces, 1928 and 1929

—	1928			1929		
	Ontario	Alberta	Canada	Ontario	Alberta	Canada
	$	$	$	$	$	$
CAPITAL EMPLOYED AS REPRESENTED BY—						
Cost of lands, buildings, plant, machinery and tools.....	31,064,794	22,330,394	53,395,188	33,411,510	24,115,323	57,526,833
Cost of supplies and stocks on hand.....	620,221	270,555	890,776	623,512	269,115	892,627
Cash, trading and operating accounts and bills receivable.....	5,186,892	2,329,528	7,516,420	6,661,271	1,720,715	8,381,986
Total.....	**36,871,907**	**24,930,477**	*62,073,384	**40,696,293**	**26,105,153**	*68,592,709

* Includes data for New Brunswick.

Table 209.—Number of Gas Wells in Canada, by Provinces, 1927, 1928 and 1929

—		New Brunswick	Ontario	Manitoba	Alberta	Canada
Productive wells at beginning of year.....	1927	*35	2,126	2	84	2,247
	1928	26	2,172	3	86	2,287
	1929	28	1,922	3	84	2,037
Number of productive wells drilled.....	1927	3	119	.....	3	125
	1928	2	126	.....	2	130
	1929	2	118	.....	8	128
Number of dry wells drilled.....	1927	.....	30	.....	1	31
	1928	.....	51	.....	2	53
	1929	.....	76	.....	.....	76
Number of wells abandoned.....	1927	.....	62	.....	1	63
	1928	.....	54	.....	5	59
	1929	.....	42	.....	2	44
Productive wells at end of year.....	1927	*38	2,172	2	86	2,298
	1928	28	1,922	3	84	2,037
	1929	30	2,120	6	90	2,246

*Includes 12 oil wells from which gas was obtained.

Table 210.—Natural Gas Wells in Ontario, by Townships, 1928 and 1929

Township	1928				1929			
	No. of producing wells in operation Dec. 31, 1928	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, 1929	No. of wells abandoned this year	No. of dry wells drilled this year	No. of producing wells drilled this year
Amabel	2				2			
Ancaster								
Bayham	40				40	1		
Bertie	85	3			84	1		
Binbrook	43	3			42			
Brantford								
Caledon E	2							
Caistor	15				15	1	1	5
Canboro	111	1			117	1		
Cayuga, North	81	4	8	17	108	5	7	19
Cayuga, South	38	3	2	3	56	2		
Charlotteville	13		3		15			
Colchester, N							1	
Crowland	48	5		2	47	1	3	
Dawn	13		4	4	13		6	
Dorchester, N					3			
Dover, East					2		2	1
Dover, West	8	1		3	6	2	5	
Dunn	30	1	5	1	30		8	1
Enniskillen	3	1		1	2			
Euphemia	6					4	3	1
Gainsboro	4				3			
Glanford	11	6	4		11	3		
Gosfield	20			1	17			
Houghton	3				3			
Howard							3	
Humberstone	81	2		2	76	9		
Mersea	2				1			
Middleton	23	1			25			
Malahide	2				2			
Mosa							1	
Moulton	91	10			91	1		
Oneida	23				23			
Onondaga	32	1			25	2		
Rainham	105	1	5	23	144	1	8	33
Raleigh	14			1	14		1	2
Romney	117	1	2	10	143	1	4	3
Sarnia	14				5			
Seneca	120	8	3	6	144	1	14	24
Sherbrooke	11				11			
Tilbury, East	128	4		12	132	1		1
Townsend	1				1			
Tuscarara	3			7	9		1	9
Wainfleet	37			2	36	1		
Walpole	81	1	11	18	137	1	8	17
Walsingham, N	9			1	10			
Walsingham, S	9				7	1		
Windham	5				8			
Willoughby	39				37	2		
Woodhouse	28		2	6	52	1		2
Private wells	300	6	2	6	300			
Surface wells	71	1			71			
Total	**1,922**	**64**	**51**	**126**	**2,120**	**42**	**76**	**118**

Table 211.—Employees, Salaries and Wages in the Natural Gas Industry in Canada, by Provinces, 1928 and 1929

Province	*Average number of employees				Salaries and wages		
	Salaried employees		Wage-earners	Total	Salaries	Wages	Total
	Male	Female					
					$	$	$
1928							
New Brunswick	4	3	14	21	18,005	22,575	40,580
Ontario	317	112	859	1,288	571,414	928,163	1,499,577
Alberta	88	22	241	351	229,500	335,991	565,491
Canada	**409**	**137**	**1,114**	**1,660**	**818,919**	**1,286,729**	**2,105,648**
1929							
New Brunswick	12	5	53	70	31,181	50,938	82,119
Ontario	374	105	890	1,369	626,818	877,926	1,504,744
Alberta	89	27	398	514	223,526	464,758	688,284
Canada	**475**	**137**	**1,341**	**1,953**	**881,525**	**1,393,622**	**2,275,147**

* See note page 37.

Table 212.—Wage-Earners in the Natural Gas Industry in Canada, by Months and by Provinces, 1928 and 1929

Month	1928				1929			
	New Brunswick	Ontario	Alberta	Canada	New Brunswick	Ontario	Alberta	Canada
January	5	420	155	**580**	13	392	188	**593**
February	5	372	157	**534**	15	345	216	**576**
March	5	439	170	**614**	18	424	207	**649**
April	19	845	182	**1,046**	35	736	266	**1,037**
May	23	1,031	258	**1,312**	48	900	364	**1,312**
June	23	1,113	330	**1,466**	59	984	415	**1,458**
July	20	1,138	350	**1,508**	64	1,048	427	**1,539**
August	15	1,087	327	**1,429**	89	1,137	412	**1,638**
September	19	1,101	243	**1,363**	98	1,022	370	**1,490**
October	15	1,099	242	**1,356**	88	977	311	**1,376**
November	12	751	203	**966**	79	946	239	**1,264**
December	6	580	183	**769**	31	728	230	**989**

PEAT

In May, 1928, the peat manufacturing plant at Alfred, Ontario, resumed operations. Production was continued until September, 1928, and 10,000 tons of peat fuel were laid on the field. Of this quantity 6,000 tons were harvested, including over 5,000 tons laid down at the railway siding and about 750 tons on the field. By the end of the year 1,200 tons of peat fuel had been shipped from the bog. In addition to this 297 tons of humus were sold for soil dressing.

During 1929 the total Canadian shipments of peat amounted to 2,607 tons valued at $13,339. Production from the St. Hyacinthe peat bog in Quebec totalled 1,607 tons. This peat was delivered locally in Montreal by trucks at $6.50 a ton. Shipments from the Alfred bog during the year reached a total of 1,000 tons.

Table 213.—Production of Peat in Canada, 1900-1929

Year	Tons	Value	Year	Tons	Value	Year	Tons	Value
		$			$			$
1900	400	1,200	1910	841	2,604	1921	1,666	6,664
1901	220	600	1911	1,463	3,817	1922	3,000	14,500
1902	475	1,663	1912	700	2,900	1923–24	.....	.....
1903	1,100	3,300	1913	2,600	10,100	1925	1,370	8,394
1904	800	2,400	1914	685	2,470	1926–1927	.....	.....
1905	80	260	1915	300	1,050	1928	1,497	5,815
1906	474	1,422	1916	300	1,500	1929	2,607	13,339
1907	50	200	1917–18	.....	.....	**Total**	**26,284**	**109,859**
1908	60	180	1919	986	6,561			
1909	60	240	1920	4,550	18,650			

THE PETROLEUM INDUSTRY IN CANADA

Including (1) Production of Crude Petroleum; and (2) Petroleum Products.

1. Production of Crude Petroleum

Crude petroleum production in Canada advanced in 1929 to a new high record for the industry of 1,117,368 barrels valued at $3,731,764. In 1928, the output was 624,184 barrels with a value of $2,035,300. The 1929 production consisted of 7,499 barrels from New Brunswick, 121,194 barrels from Ontario, and 988,675 barrels from Alberta.

Production from Alberta wells was made up of 971,821 barrels from the Turner Valley field, 14,093 barrels from the Wainwright-Ribstone field and 2,761 barrels from the Red Coulee and Skiff fields. Fifty-four wells were in operation in Alberta at the close of the year and drilling was in progress on 108 other wells. Drilling operations were continued in the Turner Valley, Wainwright-Ribstone, Red Coulee and other fields in Alberta; the total footage drilled during the year was 312,251 feet. In addition to this footage, approximately 16,200 feet of drilling was done in structure testing. Twenty-four new wells were drilled into production in Alberta during 1929.

Petroleum production in Ontario declined in 1929 to the lowest point on record for the province. This falling-off in output was due principally to unfavourable weather conditions.

New Brunswick's production was obtained from wells in the Stoney Creek field.

Activities in the petroleum industry in Saskatchewan were centred around drilling operations in the Rosetown, Simpson, Pike Lake, and Unity Valley fields.

Imports of petroleum and its products into Canada in 1929 were valued at $77,839,410, an increase of 24 per cent over the 1928 total of $62,634,866. In 1929, Canada purchased 77 per cent of her imported crude petroleum from the United States, 13 per cent from Colombia, and 10 per cent from Peru. Gasoline imports in 1929 were obtained principally from the United States and totalled 175,151,570 imperial gallons. Fuel oil importations were at a high level in 1929 reaching a total of 95,749,518 imperial gallons.

Exports of petroleum and its products from Canada were valued at $2,728,072 in 1929. Gasoline exportations were recorded at 4,669,078 imperial gallons shipped principally to the United States, Newfoundland, Alaska, British Guiana, and St. Pierre and Miquelon. Fuel oil exports totalled 28,177,495 imperial gallons of which 56 per cent was shipped to the United States and 39 per cent to the United Kingdom.

Capital actually employed in operating and drilling oil wells in Canada during 1929 was $54,526,398. This industry furnished employment to 233 salaried employees and 1,988 wage-earners whose combined earnings were $3,748,689. The cost of fuel and electricity used during the year was $293,354. Primary power employed consisted of 174 units with a total rating of 8,072 h.p., in addition to which 96 electric motors rated at 1,048 h.p. were in use.

Table 214.—Production of Crude Petroleum in Canada by Provinces, 1920-1929

(For the years 1881 to 1919 see Mineral Production of Canada 1928.)

(Barrel = 35 Imp. gal.)

Year	New Brunswick		Ontario		Alberta		Canada	
	Barrels	Value	Barrels	Value	Barrels	Value	Barrels	Value
		$		$		$		$
1920	5,148	19,963	180,071	726,286	11,032	75,986	196,251	822,235
1921	7,479	33,022	172,859	559,198	7,203	49,313	187,541	641,533
1922	7,778	32,732	164,731	526,316	6,559	52,128	179,068	611,176
1923	8,826	35,642	159,400	478,149	1,943	8,227	170,169	522,018
1924	5,561	21,313	154,368	441,952	844	4,135	160,773	467,400
1925	5,376	18,756	143,134	386,555	183,491	845,394	332,001	1,250,705
1926	10,544	29,940	137,850	379,221	216,050	902,504	364,444	1,311,665
1927	18,244	41,748	139,606	288,347	318,741	1,185,948	476,591	1,516,043
1928	8,043	21,391	134,094	249,737	482,047	1,764,172	624,184	2,035,300
1929	7,499	19,909	121,194	253,678	988,675	3,458,177	1,117,368	3,731,764

Table 215.—Production of Crude Petroleum in Canada by Provinces, 1928 and 1929

Provinces	1928		1929	
	Barrels	Total value	Barrels	Total value
		$		$
New Brunswick	8,043	21,391	7,499	19,909
Ontario—				
Petrolia and Enniskillen	60,547	111,745	56,284	116,556
Oil Springs	35,653	68,086	30,789	65,915
Moore Township	2,148	3,952	1,230	2,547
Sarnia Township	1,221	2,246	749	1,551
Plympton Township	371	683	315	652
Bothwell	24,255	44,621	23,236	48,118
West Dover	773	1,422	715	1,481
Onondaga	116	406	311	1,192
Moza Township	7,268	13,371	6,851	14,187
Thamesville	1,006	1,851	427	884
Tilbury East	736	1,354	139	288
Dunwich	.....	.....	148	307
Total for Ontario	134,094	249,737	121,194	253,078
Alberta—				
Turner Valley	474,376	1,758,710	971,821	3,440,821
Wainwright-Ribstone	7,671	5,462	14,093	13,400
Red Coulee and Skiff	.....	.....	2,761	3,956
Total for Alberta	482,047	1,764,172	988,675	3,458,177
Canada	**624,184**	**2,035,300**	**1,117,368**	**3,731,764**

Table 216.—Petroleum Wells in Canada, by Provinces, 1928 and 1929

—		New Brunswick	Ontario	Alberta	Canada
Productive wells at beginning of year	1928	23	2,669	19	2,711
	1929	25	2,643	31	2,699
Number of productive wells drilled	1928	2	3	13	18
	1929	.....	1	24	25
Number of wells abandoned	1928	.....	91	2	93
	1929	.....	146	8	154
Number of dry wells drilled	1928	.....	.....	6	6
	1929	.....	13	7	20
Number of productive wells in operation at end of year	1928	25	2,643	31	2,699
	1929	25	2,443	54	2,522

Table 217.—Imports into Canada and Exports of Petroleum, Asphalt and their Products 1927-1929

—		1927		1928		1929	
		Quantity	Value	Quantity	Value	Quantity	Value
			$		$		$
Imports—							
Asphalt and Its Products							
Asphaltum, or asphalt, solid	tons	47,737	856,225	47,991	822,425	53,750	829,328
Asphalt, not solid		.....	38,566	.....	46,890	.....	99,704
Asphaltum oil for paving purposes		.....	70,986	.....	95,562	.....	23,448
Crude Petroleum, Fuel and Gas Oils							
Crude petroleum in its natural state, ·7900 specific gravity or heavier at 60 degrees temperature, when imported by oil refiners to be refined in their own factories	gals.	684,269,831	31,043,180	853,889,703	35,237,350	1,060,000,971	46,154,347
Crude petroleum, gas oils other than naphtha, benzine and gasoline lighter than ·8235 but not less than ·775 specific gravity at 60 degrees	gals.	398,046	30,043	247,624	20,269	182,035	19,599
Petroleum, crude, not in its natural state, ·725 specific gravity or heavier but not heavier than ·770 specific gravity at 60 degrees temperature, when imported by oil refiners to be refined in their own factories	gals.	45,500	4,226	263,771	26,378	5,726,147	376,001
Petroleum (not including crude petroleum imported to be refined or illuminating or lubricating oils) ·8235 specific gravity or heavier at 60 degrees temperature	gals.	81,343,133	3,524,132	62,680,093	2,452,504	63,264,841	2,444,259
Petroleum, and other oils, imported by miners or mining companies or concerns for use in the concentration of ores of metals in their own concentrating establishments	gals.	206,332	56,435	236,516	66,727	144,890	81,691
Fuel oil, ex-warehoused for ships' stores (From April 1, 1927)	gals	37,870,909	1,543,316	32,539,383	981,622	32,302,642	868,925
Kerosene and Illuminating Oils							
Coal oil and kerosene, distilled, purified or refined	gals.	4,002,839	346,848	3,950,094	353,339	4,506,255	398,010
Illuminating oils, composed wholly or in part of the products of petroleum, coal, shale or lignite, costing more than 30 cents per gallon	gals.	8,389	4,155	3,952	2,959	9,486	3,910
Coal oil and kerosene, distilled, known as "engine distillate", when ·725 specific gravity and heavier, but not heavier than ·770 specific gravity at 60 degrees temperature	gals.	26,127	2,523	14,568	1,588	17,092	1,714
Lubricating Oils							
Lubricating oils, composed wholly or in part of petroleum, and costing less than 25 cents per gallon	gals.	5,706,327	947,128	6,797,536	1,144,645	7,369,099	1,289,594
Lubricating oils, n.o.p.	gals.	6,741,630	2,797,435	8,690,409	3,357,818	10,035,095	4,155,353
Gasoline and Other Oils							
Gasoline under ·725 specific gravity at 60 degrees temperature	gals.	85,432,311	8,794,848	116,062,590	13,526,618	135,558,699	15,096,277
Gasoline ·725 specific gravity and heavier, but not heavier than ·770 specific gravity at 60 degrees temperature	gals.	22,503,290	2,602,949	27,531,961	3,278,465	39,551,756	4,702,487
Gasoline, n.o.p.	gals.	232,727	20,897	58,565	7,335	41,115	5,322
All other oils, n.o.p.	gals.	190,983	124,033	211,832	149,548	194,794	137,337
Other Products of Petroleum							
Grease, axle	lb.	4,920,965	277,128	5,245,699	293,682	7,010,528	383,513
Paraffine wax	lb.	3,820,893	182,725	2,247,547	107,223	3,299,236	135,169
Paraffine wax candles	lb.	435,602	96,183	396,717	88,798	393,158	85,543
Vaseline and all similar preparations of petroleum for toilet, medicinal or other purposes		.....	198,501	.....	240,966	.....	250,753
Petroleum, products of, n.o.p.	gals.	1,745,896	282,032	1,860,009	332,155	1,828,536	297,126
Total		.....	**53,844,494**	.....	**62,634,866**	.....	**77,839,410**
Exports—							
Oil petroleum, crude	gals.	18,793,254	923,948	21,531,929	1,693,586	28,177,495	1,548,288
Oil, coal and kerosene, refined	gals.	1,759,838	191,533	1,297,081	127,391	1,367,241	137,160
Oil, gasoline and naphtha	gals.	2,463,370	431,011	3,957,557	686,256	4,660,078	875,027
Oil, mineral, n.o.p.	gals.	258,251	81,147	279,946	85,014	433,634	105,426
Wax, mineral	cwt.	3,609	21,327	10,010	54,501	11,556	62,171
Total		.....	**1,648,966**	.....	**2,051,748**	.....	**2,728,072**

Table 218.—Capital Employed in the Petroleum Industry in Canada, by Provinces, 1928 and 1929

—	1928				1929			
	Ontario	Saskatchewan	Alberta	Canada	Ontario	Saskatchewan	Alberta	Canada
CAPITAL EMPLOYED AS REPRESENTED BY—	$	$	$	$	$	$	$	$
Cost of lands, buildings, plant machinery and tools	1,958,936	250,000	22,274,176	24,483,112	1,940,658	397,161	43,638,703	45,976,522
Cost of supplies and stocks on hand	23,800	9,000	1,214,735	1,247,541	23,132	3,632	1,669,549	1,696,313
Cash, trading and operating accounts and bills receivable	29,181	.....	5,422,518	5,451,699	27,011	811	6,825,741	6,853,563
Total	2,011,923	259,000	28,911,429	31,182,352	1,990,801	401,604	52,133,993	54,526,398

Table 219.—Employees, Salaries and Wages in the Petroleum Industry in Canada, by Provinces, 1928 and 1929

Province	*Average number of employees				Salaries and wages		
	Salaried employees		Wage-earners	Total	Salaries	Wages	Total
	Male	Female					
1928					$	$	$
Ontario	15	2	114	131	13,720	95,145	108,865
Saskatchewan	1	1	27	29	1,500	36,165	37,665
Alberta	63	13	882	958	141,380	1,628,715	1,770,095
Canada	79	16	1,023	1,118	156,600	1,760,025	1,916,625
1929							
Ontario	14	1	119	134	11,753	91,766	103,519
Saskatchewan	4	.....	41	45	2,070	72,270	74,340
Alberta	160	54	1,828	2,042	369,667	3,201,163	3,570,830
Canada	178	55	1,988	2,221	383,490	3,365,199	3,748,689

*See note page 37.

Table 220.—Wage-Earners in the Petroleum Industry in Canada, by Provinces and by Months, 1928 and 1929

Month	1928				1929			
	Ontario	Saskatchewan	Alberta	Canada	Ontario	Saskatchewan	Alberta	Canada
January	109	1	537	647	107	21	780	908
February	109	1	588	698	107	7	769	883
March	109	1	581	691	107	7	793	907
April	106	6	682	794	109	39	1,008	1,156
May	110	20	858	988	117	31	1,331	1,479
June	113	27	898	1,038	120	15	1,698	1,833
July	110	27	917	1,054	115	15	1,811	1,941
August	113	27	963	1,103	113	15	2,027	2,155
September	107	27	907	1,041	107	24	2,040	2,171
October	108	27	918	1,053	105	24	2,058	2,187
November	102	27	871	1,000	99	15	1,946	2,060
December	101	22	863	986	98	9	1,658	1,765

2. The Petroleum Products Industry in Canada

Fifteen plants in Canada were engaged during 1929 in the refining of oils for the production of gasoline, kerosene, lubricating oils, waxes and petroleum coke. These Canadian refineries were located at strategic points across the Dominion for convenience in marketing their products. During 1929 these plants treated about 37·3 million gallons of oil from Canadian wells (including naphtha from the Turner Valley field in Alberta), and 1,035 million gallons of imported oils, obtained chiefly from the United States, Colombia and Peru. Gasoline production totalled 436·6 million gallons, including 132·6 million gallons made by the cracking process. Sales of fuel and gas oils amounted to 387 million gallons; in addition to which the refiners used 61·6 million gallons for fuel purposes. Fuel and gas oils made and used in the pressure cracking process was reported at 351 million gallons.

Ten plants in Canada were engaged during 1929 in compounding lubricating oils and greases. The total production of these plants was valued at $1,024,134.

In the separation and purification of the various products obtained by the refineries in the treatment of crude oil, large quantities of sulphuric acid, caustic soda, and other chemical pro-

ducts are used. It appears that the consumption of 66°Bé. sulphuric acid in petroleum refining is approximately one pound of acid to six gallons of crude oil; for caustic soda, the average seems to be about one pound to 100 gallons of oil. The comsumption of containers, cooperage stock, etc., reaches large figures annually, even though some shipping containers used for oil are return able. The total cost of materials used in manufacturing in 1929 was $76,861,939.

Capital employed in Canada's petroleum refining and blending industry in 1929 totalled $71,260,459. Salaries and wages paid to the 4,978 salaried employees and wage-earners during the year amounted to $8,153,625. The total value of the output of this industry was $99,408,314.

Table 221.—Materials Used and Products Made by the Oil Refineries of Canada, 1927-1929

—	1927		1928		1929	
	Quantity	Value	Quantity	Value	Quantity	Value
		$		$		$
MATERIALS USED—						
Petroleum refining—						
Crude oil, product of Canadian wells ... imp. gal.	15,632,271	1,783,413	20,324,814	2,112,314	37,338,402	4,026,272
Crude oil, imported ... imp. gal.	700,737,619	47,376,673	829,608,956	50,952,144	1,035,490,094	68,082,715
Imported fuel and gas oils for use in cracking process ... imp. gal.	...	...	...	...	440,475	18,270
Sulphuric acid (66° Bé) (Not made by firm reporting) ... lb.	49,728,504	407,894	51,828,643	408,905	49,610,612	425,853
Sulphur (not used in acid manufacture lb.	145,980	4,498	164,044	5,105	201,032	6,770
Caustic soda ... lb.	3,798,427	147,684	4,345,466	159,803	6,699,874	243,319
Soda ash ... lb.	412,489	8,594	381,196	8,023	404,185	9,315
Litharge ... lb.	473,785	48,714	659,882	57,527	799,464	69,698
Fullers' earth ... lb.	8,304,713	80,611	11,707,839	109,221	18,513,820	207,931
Other materials ...	...	691,442	...	860,055	...	758,246
Shipping containers ...	...	2,194,007	...	2,360,088	...	2,440,793
Total ...	...	**52,743,530**	...	**57,033,185**	...	**76,289,182**
Lubrication oils and greases—Total ...	...	...	...	**359,656**	...	**572,757**
Grand total ...	...	...	...	**57,383,841**	...	**76,861,939**
PRODUCTS MADE—						
Petroleum refining—						
Made for sale—						
Gasoline (a) straight run ... imp. gal.	184,793,169	24,553,479	226,904,777	33,574,295	303,911,713	43,250,498
(b) by cracking process ... imp. gal.	73,722,859	10,614,360	117,175,542	18,647,134	132,646,696	20,242,805
Fuel and gas oils ... imp. gal.	239,272,246	11,394,422	309,185,187	12,543,505	387,069,829	15,586,290
V.M. & P. or solvent naphtha imp. gal.	6,195,040	720,360	4,949,743	643,350	7,259,910	974,348
Kerosene ... imp. gal.	54,287,118	6,017,819	55,939,530	7,335,353	49,297,417	6,870,711
Lubricating oils ... imp. gal.	18,514,655	3,431,326	19,022,749	3,340,097	22,900,238	3,943,418
Grease ... lb.	11,098,402	239,778	14,439,030	266,590	17,042,195	316,848
Tar ... lb.	...	...	...	...	1,032,500	8,260
Asphalt ... imp. gal.	21,800,573	2,287,139	22,326,606	2,016,630	35,233,347	2,688,579
Petroleum coke ... tons	69,379	403,555	80,361	467,548	84,108	465,753
Wax and candles ... lb.	2,525,909	505,125	15,872,946	599,335	10,776,352	537,886
Other products ...	...	464,787	...	368,915	...	258,113
Total for sale ...	...	61,232,150	...	79,802,752	...	95,143,509
Made for own use:—						
Gasoline (a) straight run ... imp. gal.	25,209	3,514	49,542	7,413	62,205	8,813
(b) by cracking process ... imp. gal.	8,487	1,995	...	...	...	...
Fuel and gas oils (except for cracking) ... imp. gal.	47,253,487	2,189,990	52,206,663	1,907,829	61,029,931	2,308,963
V.M. & P. or solvent naphtha imp. gal.	10,498	1,258	9,728	1,376	11,371	1,490
Kerosene ... imp. gal.	28,961	3,594	42,389	5,191	64,964	8,763
Lubricating oils ... imp. gal.	17,417	3,117	26,297	3,884	24,960	4,191
Petroleum coke ... tons	6,850	45,663	15,547	93,882	25,408	140,230
Still gas ... M cu. ft.	1,719,394	450,301	2,489,346	572,847	3,140,187	708,781
Acid sludge ...	...	48,267	...	53,218	...	53,909
Other products ...						5,531
Total for own use ...	...	2,747,699	...	2,645,640	...	3,240,671
Total Petroleum refining ...	...	**63,979,849**	...	**82,448,392**	...	**98,384,180**
Fuel and gas oils made and used in pressure cracking process ... imp. gal.	189,962,745	...	284,510,884	...	351,436,512	...
Lubricating oils and greases—						
Lubricating oils ... imp. gal.	1,059,225	375,840	1,244,350	464,613	1,522,045	745,876
Lubricating greases ... lb.	424,243	67,668	657,708	82,269	688,384	92,604
Soaps ... lb.	...	58,344	...	70,859	465,064	66,395
Other products ...	...	47,119	...	56,039	...	119,859
Total lubricating oils and greases ...	...	**548,971**	...	**673,780**	...	**1,024,134**
Grand total ...	...	**64,528,820**	...	**83,122,172**	...	**99,408,314**

CHAPTER EIGHT

THE NON-METAL MINING INDUSTRIES IN CANADA. (Other than Fuels)

Including detailed data relating to operations in the following industries:—

Abrasives
Asbestos
Feldspar
Graphite
Gypsum
Iron oxides
Mica
Quartz
Salt
Talc and soapstone

Miscellaneous—
Actinolite
Barytes
Bituminous sands
Fluorspar
Lithium minerals
Magnesite
Magnesium sulphate
Manganese, bog
Mineral waters
Natro-alunite
Phosphate
Pyrites
Silica brick
Sodium carbonate
Sodium sulphate

THE ABRASIVES INDUSTRY IN CANADA

The abrasives industry in Canada includes two main divisions: (1) The natural abrasives industry, covering the production of natural abrasives such as grindstones, pulpstones and scythestones, corundum, diatomite, volcanic dust, etc.; and (2) The artificial abrasives and abrasive products industry which covers the manufacture of silicon carbide, fused alumina, abrasive wheels, abrasive paper, etc.

(1) Abrasives, natural

This group of industries includes the production of corundum, diatomite, garnets, grinding pebbles, grindstones, pulpstones and scythestones, and volcanic dust.

Corundum.—Corundum is found in an area embracing several townships in Renfrew and Hastings counties in the province of Ontario. The industry made its appearance in these areas in 1900 and production reached a maximum in 1906. In 1921, grain corundum amounting to 403 tons valued at $55,965 was exported to the United States, since that year no shipments of corundum have been reported.

Diatomite.—Prior to 1928 the Canadian production of diatomite was obtained from deposits in the province of Nova Scotia. In 1896, shipments of diatomite totalling 644 tons were made; this was the first official record of production in Canada. Deposits at Silica lake and near St. Ann's, Cape Breton, have been worked. This company's shipments prior to 1927 were made from deposits located in the vicinity of Silica lake, Colchester county. The diatomite was calcined in rotary furnaces before shipment to a plant at Haverstraw, New York. Development work was carried on during 1926 in connection with a diatomite deposit at East New Annan, Nova Scotia and in 1927 shipments of diatomite amounting to 266 tons were made.

In 1929 shipments of diatomite amounted to 429 tons valued at $10,330. These shipments were made from deposits at East New Annan, Nova Scotia, and Quesnel, British Columbia.

Diatomite, sometimes called tripolite, is a silicious fossil material closely related to quartz in composition and is used principally for heat and sound insulation, as an absorbent, a filtering medium, a filler, a mild abrasive, and as a structural material.

Garnets.— A deposit of garnets in Ashby township, Ontario, was operated during 1923 and 1,250 tons of garnet concentrates and crude garnets were shipped to Niagara Falls, New York, for use as an abrasive material. In 1924, a shipment of 360 tons of garnets was made but there has been no production from this deposit since that date. In 1927, development work was done on a garnet deposit in Joly township, Labelle county, Quebec, and a shipment of 2 tons was made. During 1929, garnet deposits in Bauden, Joly and Trevet townships, Quebec, were being developed.

Grinding Pebbles.—Grinding pebbles have been obtained for a number of years along the shore of Lake Superior, near Jackfish, Ontario. During 1920 the production amounted to 560 tons; in 1925 the total was 105 tons; and in 1926 shipments were considerably lower, amounting to only 64 tons. Since 1926 there was no production of grinding pebbles in Canada.

The Hedley Gold Mining Company used pebbles obtained from Hedley, Similkameen district, British Columbia, in 1922. These pebbles were produced at a cost of $4 per ton as compared with $35 per ton for the imported Danish pebbles.

Grindstones, Pulpstones and Scythestones.—In Nova Scotia at Lower Cove near Joggins and at Minudie, grindstones were produced as early as 1750. Production from these quarries is reported to have been over 4,000 tons annually for a number of years around 1850. In 1873 shipments from Minudie amounted to 1,590 tons and in the following year the output from Lower Cove was 750 tons valued at $12,000; and from Shore Cove 350 tons worth $4,200.

Sandstone deposits near Pictou and Merigomish Harbour were operated between 1840 and 1865. The Mic Mac Quarry, east of Woodburn, produced grindstones up to 1927. This quarry averaged 300 tons annually from 1913 to 1926. The majority of the stones were shipped to the United States for saw and machine knife grinding.

Quarry Island has been the scene of operations for 60 years, and during the period 1870 to 1914 a production of 200 tons to 300 tons was recorded annually. However, since that time only a small quantity has been shipped each year.

In New Brunswick considerable activity was evidenced in this industry on Grindstone Island during the period 1800-1850, but since the latter date no shipments appear to have been made. From 1835 to 1885, a large number of quarries were operated in the southern part of the peninsula, between Petitcodiac and Memramcook rivers. These grindstones were exported mainly to the United States for file and spring grinding purposes. The Beaumont quarry was opened up in this district in 1899 and was closed down in 1919. In 1923, the Rockland quarry situated north of the Beaumont was opened up and since then some experimental shipments have been made.

Grindstone production started at Rockport, New Brunswick in 1815. Practically all of the stones cut since 1890 were sent to the Wood Point Plant in crude form for finishing. Prior to 1880, a small quantity of grindstones was produced from the sandstone reefs near Wood Point. From 1896 to 1906, production from these quarries ranged between 200 tons and 300 tons annually, which was increased to 800 tons to 1,000 tons during the next ten years. There have been no grindstones produced here since 1918.

In Northumberland county the production of grindstones commenced in 1870. Quarries have been operated at various points near Newcastle, but, with the introduction of Ohio stones on the New England markets operations were curtailed and only the Miramichi, Read and Fish quarries remained active.

New Brunswick grindstone quarries in operation in 1871 employed 200 men earning $30,635 and made $40,953 worth of products. In 1881 eight quarries were operated, seven in Gloucester county and one in Westmoreland, with a capital investment of $10,250; a payroll of 136 men receiving $20,975 in wages and a production valued at $30,297. The high record for the industry, according to available information, was reached in 1907 when 4,833 tons were produced.

About 1830 the grey sandstones on the east side of Grindstone Island, the centre island of the Magdalen group in Quebec were worked by the French inhabitants and grindstones made for local use.

Some grindstones and scythestones have been shipped from sandstone deposits in Clara and Nottawasaga townships, Ontario. Shipments from the former township were made between 1870 and 1875 and from the latter between 1860 and 1870.

A sandstone quarry situated on Newcastle Island about one mile northeast of Nanaimo, British Columbia commenced shipping pulpstones in 1923. These stones are mainly of smaller sizes, although a few magazine grinders have been produced.

Volcanic Dust.—The extensive beds of volcanic dust that occur near Waldeck, 11 miles northeast of Swift Current, were first discovered in 1918. Shipments have been made from these deposits annually for the past six years. During 1929, production amounted to 300 tons valued at $6,000.

Volcanic dust is used for purposes similar to ground pumice, particularly in the manufacture of cleansers and scouring powders and in some instances as a substitute for fuller's earth in the refining of hard oils and fats. The domestic market is not large, nevertheless, only about 2 per cent is supplied by the home product.

Table 222.—Capital Employed in the Natural Abrasives Industry in Canada, 1928 and 1929

—	1928	1929
	$	$
CAPITAL EMPLOYED AS REPRESENTED BY—		
Cost of lands, buildings, machinery and tools	339,166	631,639
Cost of supplies and stocks on hand	58,253	72,785
Cash, trading and operating accounts and bills receivable	51,199	86,367
Total	**448,618**	**790,791**

Table 223.—Wage-Earners in the Natural Abrasives Industry in Canada, by Months, 1928 and 1929

Month	Number		Month	Number	
	1928	1929		1928	1929
January	10	83	July	180	213
February	10	94	August	158	189
March	12	97	September	109	158
April	40	109	October	83	135
May	126	175	November	72	76
June	158	176	December	90	22

Table 224.—Production of Corundum in Canada, 1900-1929

(Short tons)

Year	Corundum-bearing rock treated	Grain corundum graded	Per cent recovery	Shipments of grain corundum				Average price in cents per pound
				Sold in Canada	Exported	Total shipments	Total value	
	Tons	Tons		Tons	Tons	Tons	$	
1900	.....	60	.....	3	.....	3	300	5·00
1901	4,134	434	10·7	85	302	387	46,415	5·97
1902	7,996	805	10·1	106	662	768	84,465	5·49
1903	(a) 8,877	839	9·5	85	618	703	77,510	5·51
1904	28,187	1,654	5·9	116	877	993	109,545	5·51
1905	23,571	1,681	7·1	140	1,504	1,644	149,153	4·48
1906	45,719	2,914	6·4	162	2,112	2,274	204,973	4·50
1907	60,532	2,682	4·4	164	1,728	1,892	177,922	4·70
1908	2,678	105	4·0	99	990	1,089	100,398	4·60
1909	35,894	1,579	4·4	129	1,362	1,491	162,492	5·45
1910	37,183	1,686	4·5	106	1,764	1,870	198,680	5·31
1911	41,975	1,641	3·9	92	1,380	1,472	161,873	5·50
1912	36,879	1,620	4·4	63	1,897	1,960	239,091	6·10
1913	12,290	763	6·2	23	1,154	1,177	137,036	5·82
1914	12,111	695	5·7	14	534	548	72,176	6·59
1915	1,724	116	6·7	21	241	262	33,138	6·33
1916	1,864	67	3·6	8	59	67	10,307	7·65
1917	4,659	188	4·0	16	172	188	32,153	8·55
1918	3,184	137	4·3	.....	137	137	26,112	9·90
1919	1,300	26	2·0	.....	.....	.....	.....	.....
1920	(b) 13,025	322	2·5	20	176	196	24,547	6·25
1921	(b) 11,256	407	3·6	.....	403	403	55,965	6·94
1922-1929	.....	.....	.....	.....	.....	.....	.....	.....
Total	**395,038**	**20,422**	.....	**1,452**	**18,072**	**19,524**	**2,104,251**	.....

(a) In addition to this amount which was milled in Canada, 267 tons of ore were mined and shipped to the United States for treatment there.

(b) Tailings only.

Table 225.—Production of Diatomite in Canada, 1896-1929

Year	Tons	Value	Year	Tons	Value	Year	Tons	Value
		$			$			$
1896	644	9,960	1907	30	225	1919	565	11,300
1897	15	150	1908	30	195	1920	260	8,600
1898	1,017	16,660	1909	.....	.....			
1899	1,000	15,000	1910	22	134	1921	341	11,268
1900	336	1,950				1922	219	5,781
			1911	20	122	1923	130	3,250
1901	850	15,300	1912	38	230	1924	33	838
1902	1,052	16,470	1913	620	12,138	1925-1926	.....	.....
1903	835	16,700	1914	650	13,000			
1904	320	6,400	1915	317	12,119	1927	266	6,650
1905	300	3,600				1928	368	8,960
			1916	620	12,139	1929	429	10,330
1906	.....	.....	1917	600	18,000			
			1918	500	12,500	**Total**	**12,427**	**249,969**

Table 226.—Production of Grindstones in Canada, by Provinces, 1920-1929

(For the years 1886 to 1919 see Mineral Production of Canada 1928)

Year	Nova Scotia		New Brunswick		**Canada**	
	Tons	Value	Tons	Value	**Tons**	**Value**
		$		$		$
1920	211	8,440	2,051	65,679	**2,262**	**74,119**
1921	183	6,990	881	33,647	**1,064**	**40,637**
1922	102	3,692	735	26,600	**837**	**30,292**
1923	254	7,906	1,463	43,577	**1,717**	**51,483**
1924	338	12,525	1,693	56,586	**2,031**	**69,111**
1925	439	16,723	1,296	45,061	**1,735**	**61,784**
1926	311	15,136	1,202	43,850	**1,513**	**58,986**
1927	11	220	1,306	47,255	**1,317**	**47,475**
1928	.....	.....	1,250	45,901	**1,250**	**45,901**
1929	6	110	1,032	37,291	**1,038**	**37,401**

Table 227.—Production of Pulpstones, Sharpening Stones, and Polishing Grit in Canada, 1920-1929

(For the years 1892 see Mineral Production of Canada 1928)

Year	Pulpstones		Sharpening stones		Polishing grit	
	Tons	Value	Tons	Value	Tons	Value
		$		$		$
1920	125	10,000	56	3,987	1	30
1921	200	22,000	17	1,430	.....	.....
1922	150	12,000	18	1,450	.....	.....
1923	260	25,100	35	3,500	.....	.....
1924	624	58,113	36	3,600	.....	.....
1925	781	57,781	46	4,600	.....	.....
1926	1,155	89,541	27	2,700	.....	.....
1927	911	75,242	23	2,300	.....	.....
1928	581	52,659	24	2,400	.....	.....
1929	754	62,336	155	6,617	.....	.....

Table 228.—Production of Grindstones, Pulpstones and Scythestones in Canada, by Provinces, 1927-1929

Province	1927		1928		1929	
	Tons	Value	Tons	Value	Tons	Value
		$		$		$
Nova Scotia	11	220	.....	.....	6	110
New Brunswick	1,860	97,197	1,609	80,451	1,731	103,514
British Columbia	380	27,600	246	20,509	210	2,730
Total	**2,251**	**125,017**	**1,855**	**100,960**	**1,947**	**106,354**

Table 229.—Imports into Canada and Exports of Abrasives, 1927-1929

Item	1927		1928		1929	
	Quantity	Value	Quantity	Value	Quantity	Value
		$		$		$
IMPORTS—						
Abrasives—						
Artificial abrasives in bulk, crushed or ground, when imported for use in the manufacture of abrasive wheels and polishing composition	.....	216,174	.....	244,771	.....	251,704
Carborundum wheels or stones not further manufactured than moulded and burned	.....	131,428	.....	222,386	.....	219,475
Diamond dust or bort, and black diamonds for borers	.....	1,396,122	.....	2,281,249	.....	2,727,285
Diatomaceous earth or infusorial earth (Kieselguhr) ground or unground (from April 1, 1928) ..... cwt.	.....	.....	5,354	9,594	23,857	40,539
Emery in bulk, crushed or ground	.....	46,649	.....	53,289	.....	54,433
Emery wheels and carborundum wheels, n.o.p.	.....	56,916	.....	109,185	.....	133,779
Emery or carborundum, manufactures of, including carborundum stones, n.o.p.	.....	76,987	.....	83,942	.....	99,036
Grindstones, not mounted, and not less than 36 inches in diameter	.....	815,257	.....	612,792	.....	424,613
Grindstones, n.o.p.	.....	96,451	.....	40,598	.....	23,769
Pumice and pumice stone, lava and calcareous tufa, not further manufactured than ground	.....	35,211	.....	48,062	.....	35,955
Sand paper, glass, flint and emery paper or emery cloth	.....	348,652	.....	423,357	.....	498,328
Iron sand or globules for polishing and sawing	.....	12,052	.....	18,110	.....	41,934
Burrstones in blocks, rough or unmanufactured, not bound up or prepared for binding into mill-stones ..... No.	3	450	119	9[illegible]5	30	1,310
Total	.....	**3,232,349**	.....	**4,148,260**	.....	**4,552,160**
EXPORTS—						
Grindstones, manufactured	.....	50,866	.....	28,747	.....	36,536
Abrasives—						
Natural, n.o.p. ..... cwt.	5,516	6,426	5,871	7,071	8,287	9,757
Artificial, crude, including carborundum ..... cwt.	1,000,321	2,645,347	1,235,302	3,295,460	1,571,816	3,815,804
Artificial, made up into wheels, stones, etc.	.....	38,463	.....	63,745	.....	53,666
Total	.....	**2,741,102**	.....	**3,395,023**	.....	**3,915,763**

2. Abrasives, Artificial and Abrasive Products.

Manufactures of artificial abrasives and abrasive products in Canada amounted in value to $8,961,951 in 1929. This was an increase of 26 per cent over the corresponding selling value for 1928. The principal products were fused alumina, 53,857 tons worth $4,974,789; crude silicon carbide, 21,592 tons valued at $2,577,033; and abrasive wheels valued at $819,884. Other products were ferrosilicon, abrasive cloth and paper, firesand and sharpening stones.

For 1929 reports were received from 12 plants of which 11 were in Ontario and 1 in Quebec. Capital employed amounted to $6,683,533 distributed as follows: cost of lands, buildings, equipments, etc., $4,166,186; supplies and stock on hand, $1,331,556; cash trading and operating accounts and bills receivable, $1,185,791. The average number of employees was 828 and salaries and wages for the year totalled $1,270,898. Materials used in manufacturing cost $2,905,928 at the works, and the value added by manufacturing processes was $6,056,023.

ASBESTOS

Asbestos was discovered in the Des Plantes river region, between St. Joseph and St. Francis villages, Quebec, about 1862. Operation of these deposits was found, however, to be unprofitable owing to their limited character.

The next discovery of asbestos was made in the district of Thetford and Coleraine in 1877. In the following year mining was commenced on a small scale and some fifty tons were produced The fibre produced was excellent but it was difficult to find a market.

In the course of the next twelve years developments in the industry were rapid. Seven quarries were in operation in 1885 and the exports during that year totalled 2,440 tons. First quality asbestos sold for $80 per ton; however, a gradual increase in price was recorded and in 1900 when the total production was 29,141 tons this grade brought $300 per ton. Production in 1910 advanced to 102,215 tons; employees numbered 3,693 with total wages of $1,528,544. In 1920, there were 18 mines in operation, the quantity sold was 199,573 tons valued at $14,792,201 employees totalled 3,572 and wages paid were $4,765,305.

Canada, the world's leading asbestos producer, attained a new high record, in the production of this mineral during 1929. Shipments for the year amounted to 306,055 tons valued at $13,172,581, an increase of 12·1 per cent in quantity and 17·2 per cent in value as compared with the production of the previous year. The average value received by the seven operating firms was $43.04 per ton as compared with $41.16 in 1928. Asbestos rock mined during the year totalled 6,208,970 tons of which 4,384,120 tons were milled.

Production of asbestos increased in Rhodesia, South Africa and in the United States during 1929. The output from deposits in Rhodesia totalled 42,634 tons, from South Africa, 33,024 tons, and from the United States, 3,155 tons; a decrease was recorded in the production from Cyprus.

Twelve plants in Canada manufactured asbestos products including paper and mill board, asbestos roofing of all kinds, asbestos rigid shingles, asbestos building materials, asbestos cellular and sponge-felted pipe insulation, insulating sheets and blocks, asbestos brake linings and clutch facings (woven on special looms), and asbestos packings for steam, oil and hydraulic operations. In 1929 production from these plants was valued at $2,286,638.

Table 230.—Production of Asbestos in Canada, 1920-1929

(For the years 1880 to 1919 see Mineral Production of Canada, 1928)

Year	Short tons	Value	Year	Short tons	Value
		$			$
1920	199,573	14,792,201	1925	273,524	8,977,546
1921	92,761	4,906,230	1926	279,403	10,099,423
1922	163,706	5,552,723	1927	274,778	10,621,013
1923	231,482	7,522,506	1928	273,033	11,238,360
1924	225,744	6,710,830	1929	306,055	13,172,581

Table 231.—Mill Output and Shipments of Canadian Asbestos, 1928 and 1929

Classification	1928				1929			
	Total output	Sold or shipped			Total output	Sold or shipped		
		Quantity	Total sales value at mill	Average value per ton		Quantity	Total sales value at mill	Average value per ton
	Tons	Tons	$	$	Tons	Tons	$	$
Crude No. 1	706	893	477,640	534·87	883	802	447,259	557·68
Crude No. 2	2,784	2,757	818,174	296·76	2,864	2,625	870,888	331·77
Other crudes	507	516	65,868	127·65	1,053	931	168,226	180·69
Spinning stocks	14,051	13,570	2,017,884	148·70	19,615	17,545	3,110,848	177·31
Shingle stocks	41,975	34,961	2,580,160	73·80	34,038	34,177	2,572,216	75·26
Mill board and paper stocks	71,141	78,443	3,038,227	38·73	91,892	91,157	3,515,209	38·56
Fillers, floats and other short fibres	142,701	141,893	2,240,407	15·79	163,859	158,818	2,487,935	15·66
Total	**273,865**	**273,033**	**11,238,360**	**41·16**	**311,204**	**306,055**	**13,172,581**	**43·04**
Sand and gravel*	23,441	22,787	13,469	0·59	18,976	18,976	7,303	0·38

*This production has been included under the "Sand and Gravel Industry."

Table 232.—Imports of Asbestos into Canada, 1927-1929

Item	1927		1928		1929	
	Tons	Value	Tons	Value	Tons	Value
		$		$		$
Asbestos in any form other than crude, and all manufactures of, n.o.p.	.....	562,794	.....	727,843	.....	897,229
Asbestos packing	114	109,088	101	108,044	113	116,207
Total	.....	**671,882**	.....	**835,887**	.....	**1,013,436**

Table 233.—Exports of Canadian Asbestos by Countries of Destination, 1927-1929

Commodity and Destination	1927		1928		1929	
	Tons	Value	Tons	Value	Tons	Value
		$				$
ASBESTOS—						
Great Britain	11,673	818,858	6,886	547,250	3,508	350,410
United States	75,930	4,706,247	80,765	5,157,955	91,876	6,033,946
Australia	1,697	119,965	1,390	104,275	1,463	137,087
Belgium	8,068	540,655	3,841	309,149	14,291	987,896
France	5,486	409,840	7,012	505,825	6,583	504,539
Germany	16,317	1,223,768	13,589	1,153,177	11,329	1,189,580
Italy	3,687	246,633	3,431	296,148	2,424	234,971
Japan	7,553	402,075	9,165	507,758	10,557	567,809
Netherlands	2,533	209,299	2,464	168,289	1,240	87,215
Spain	22	1,210	431	33,055	92	6,569
Other countries	259	18,835	218	19,677	362	27,209
Total	**133,225**	**8,697,376**	**129,192**	**8,802,558**	**143,725**	**10,127,208**
SAND AND WASTE—						
Great Britain	2,823	65,479	1,904	40,727	2,335	55,850
United States	120,378	1,830,728	126,417	1,960,491	140,588	2,320,084
Germany	3,512	73,173	3,460	84,950	2,667	66,625
Netherlands	2,203	46,939	1,988	48,900	1,201	30,025
Other countries	1,149	21,616	1,900	42,661	1,514	34,890
Total	**130,065**	**2,037,935**	**135,729**	**2,177,729**	**148,305**	**2,507,474**
ASBESTOS MANUFACTURES INCLUDING ASBESTOS ROOFING—						
Great Britain	.....	7,479	.....	7,738	.....	58,769
United States	.....	18,599	.....	22,711	.....	21,556
British South Africa	.....	831	.....	.....	.....	.....
Newfoundland	.....	5,383	.....	5,765	.....	4,707
New Zealand	.....	859	.....	1,571	.....	592
Other countries	.....	33,183	.....	28,110	.....	28,328
Total	.....	**66,334**	.....	**65,895**	.....	**113,952**

Table 234.—Monthly Average Prices of Asbestos by Grades, 1928 and 1929

(Per short ton)

(Computed from quotations in the *Engineering and Mining World*)

Month	Crude No. 1	Crude No. 2	Spinning fibres	Magnesia and compressed sheet fibres	Shingle stock	Paper stock	Cement stock	Short fibres	Floats
	$	$	$	$	$	$	$	$	$
1928									
January	650	450	212	168	100	48	25	15	15
February	650	450	212	168	90	48	25	15	15
March	650	450	212	170	90	48	25	15	15
April	650	400	212	168	90	48	25	15	15
May	625	388	208	168	85	48	25	15	15
June	625	388	208	168	85	48	25	15	15
July	625	388	208	168	85	48	25	15	15
August	625	388	208	168	85	48	25	15	15
September	625	388	208	168	85	48	25	15	15
October	625	388	208	168	85	48	25	15	15
November	625	388	208	168	85	48	25	15	15
December	625	388	208	168	85	48	25	15	15
Average	**633**	**406**	**209**	**168**	**88**	**48**	**25**	**15**	**15**
1929									
January	650	512	250	200	85	47	25	15	13
February	650	512	250	200	85	47	25	15	13
March	650	512	250	200	85	47	25	15	13
April	650	512	250	200	85	47	25	15	13
May	650	512	250	200	85	47	25	15	13
June	650	512	250	200	85	47	25	15	13
July	650	512	250	200	85	47	25	15	13
August	650	512	250	200	85	47	25	15	13
September	650	512	250	200	85	47	25	15	13
October	650	512	250	200	85	47	25	15	13
November	650	512	250	200	85	47	25	15	13
December	650	512	250	200	85	47	25	15	13
Average	**650**	**512**	**250**	**200**	**85**	**47**	**25**	**15**	**13**

Table 235.—Capital Employed in the Asbestos Industry in Canada, 1927-1929

—	1927	1928	1929
	$	$	$
CAPITAL EMPLOYED AS REPRESENTED BY—			
Cost of lands, buildings, machinery and tools	30,837,295	32,262,720	29,776,658
Cost of supplies and stocks on hand	1,686,084	1,850,799	1,893,501
Cash, trading and operating accounts and bills receivable	2,793,442	1,591,684	1,578,798
Total	**35,316,821**	**35,705,212**	**33,248,957**

Table 236.—Employees, Salaries and Wages in the Asbestos Industry in Canada, 1928 and 1929

—	1928				1929			
	Number			Salaries and wages	Number			Salaries and wages
	Male	Female	Total		Male	Female	Total	
				$				$
Salaried Employees	128	19	147	372,070	172	25	197	419,799
Wage-Earners—								
Mine	1,739	.....	1,739	.....	1,835	.....	1,835	
Mill	1,284	.....	1,284	.....	1,359	.....	1,359	.....
Total	3,023	.....	3,023	3,617,574	3,194	.....	3,194	3,990,736
Grand total	**3,151**	**19**	**3,170**	**3,989,644**	**3,366**	**25**	**3,391**	**4,410,535**

Table 237.—Wage-Earners in the Asbestos Industry in Canada by Months, 1928 and 1929

Month	1928		1929		Month	1928		1929	
	Mine	Mill	Mine	Mill		Mine	Mill	Mine	Mill
January	1,514	1,219	1,491	1,095	July	1,670	1,306	1,931	1,441
February	1,553	1,165	1,659	1,168	August	1,779	1,352	1,912	1,451
March	1,595	1,170	1,761	1,294	September	1,886	1,435	1,944	1,499
April	1,578	1,171	1,733	1,271	October	1,924	1,409	1,947	1,454
May	1,652	1,199	1,816	1,400	November	1,914	1,388	1,957	1,457
June	1,733	1,258	1,867	1,388	December	1,856	1,308	1,943	1,434

Table 238.—*World Production of Asbestos, 1925-1929

(Long tons)

Country	1925	1926	1927	1928	1929
BRITISH EMPIRE					
Canada[1]	259,275	249,467	245,337	243,780	273,264
Southern Rhodesia[2]	30,669	29,771	29,621	35,679	38,066
Union of South Africa[2]	9,078	13,884	21,004	24,197	28,717
Australia[2]	51	109	11	5	255
Cyprus[2] (exports)	3,221	6,313	11,380	16,287	14,110
India[2]	16	80	68	157	318
Total	302,310	299,624	307,421	320,105	354,730
FOREIGN COUNTRIES					
China[2]	213	(a)	(a)	(a)	(a)
Finland[2]	1,700	2,133	2,385	2,241	1,538
Italy[2]	2,071	2,500	4,470	4,724	(a)
Russia[2]	10,000	18,044	20,822	26,000	(a)
United States[3]	1,123	1,213	2,662	1,999	2,817
France[2]	654	650	790	(a)	(a)
Japan[2]	1,155	1,000	1,000	1,000	1,000
Total	16,916	25,540	32,129	35,964	5,355
Grand total	**319,226**	**325,164**	**339,550**	**356,069**	**360,085**

*Source—
[1]Dominion Bureau of Statistics, Canada.
[2]Imperial Institute publications.
[3]Mineral Resources of the United States.
(a) Data not available.

FELDSPAR

The first record of production in the feldspar industry in Canada dates back to about the year 1890. The production during that year was approximately 700 tons and since that date an increase has been recorded until in 1924 the maximum output for the industry, namely, 44,804 tons, was produced.

Feldspar production in Canada during 1929 increased 17·6 per cent in quantity and 19·5 per cent in value over the totals for 1928. The 1929 production was 37,527 tons valued at $340,471 as compared with shipments of 31,897 tons worth $284,942 in the previous year.

All of the feldspar mined in Canada is of the potash variety known as orthoclase or microline. Soda feldspar (albite) is known to occur, but there is little demand for this variety and none is mined.

The principal producing localities in 1929 were the Hybla, Perth, and Verona areas, in Ontario, and Aylwin township and the Buckingham area in Quebec. The last named came to the fore in 1921, when development work proved up several bodies of exceptionally good feldspar and resulted in a production of 10,000 tons from one quarry alone in that year. The Richardson mine, near Verona, Ontario, formerly an important producer but idle for many years, was re-opened during 1928.

The Kingston plant for the fine grinding of feldspar was in operation during 1929.

Exports of Canadian crude feldspar in 1929 totalled 29,896 tons appraised at $242,915. These exports were principally to the United States. An increase of 24·7 per cent was recorded in the imports of feldspar into Canada in 1929. There were 19 firms reported as operating in Canada during the past year.

Table 239.—Production of Feldspar in Canada, by Provinces, 1920-1929

(For the years 1890-1919 see Mineral Production of Canada, 1928)

Year	Quebec		Ontario		Canada	
	Tons	Value	Tons	Value	Tons	Value
		$		$		$
1920	649	10,052	37,224	270,843	37,873	280,895
1921	9,737	80,180	20,115	150,457	†29,868	†230,754
1922	12,472	127,826	15,255	120,576	27,727	248,402
1923	12,026	102,779	17,199	134,822	29,225	237,601
1924	16,147	142,118	28,657	216,422	44,804	358,540
1925	11,287	94,730	17,394	141,059	28,681	235,789
1926	13,168	111,136	22,783	199,102	35,951	310,238
1927	12,730	104,618	17,119	154,533	29,849	259,151
1928	12,943	104,789	18,954	180,153	31,897	284,942
1929	15,790	133,492	21,737	206,979	37,527	340,471

†Includes Nova Scotia production of 16 tons valued at $117.

Table 240.—Production in Canada, Imports and Exports of Feldspar, 1927-1929

—	1927		1928		1929	
	Tons	Value	Tons	Value	Tons	Value
		$		$		$
PRODUCTION—						
Quebec	12,730	104,618	12,943	104,789	15,790	133,492
Ontario	17,119	154,533	18,954	180,153	21,737	206,979
Total	**29,849**	**259,151**	**31,897**	**284,942**	**37,527**	**340,471**
IMPORTS	3,040	50,875	3,171	53,818	3,955	65,997
EXPORTS	28,648	225,955	28,101	230,945	29,896	242,915

Table 241.—Capital Employed in the Feldspar Industry in Canada, 1928 and 1929

—	1928	1929
	$	$
CAPITAL EMPLOYED AS REPRESENTED BY—		
Cost of lands, buildings, machinery and tools	146,480	116,005
Cost of supplies and stocks on hand	18,838	34,696
Cash, trading and operating accounts and bills receivable	72,073	72,742
Total	**237,400**	**223,443**

Table 242.—Employees, Salaries and Wages in the Feldspar Industry in Canada, 1928 and 1929

—	1928				1929			
	Number			Salaries and wages	Number			Salaries and wages
	Male	Female	Total		Male	Female	Total	
				$				$
Salaried employees	7	1	8	14,172	5	4	9	19,936
Wage-earners	215	.....	215	130,488	200	.....	200	144,504
Total	**222**	**1**	**223**	**144,660**	**205**	**4**	**209**	**164,440**

Table 243.—Wage-Earners in the Feldspar Industry in Canada, by Months, 1928 and 1929

Month	Number		Month	Number	
	1928	1929		1928	1929
January	144	150	July	205	182
February	152	132	August	198	215
March	122	127	September	207	208
April	109	119	October	188	175
May	133	201	November	189	167
June	176	210	December	184	148

Table 244.—*World Production of Feldspar, 1925-1929

(Long tons)

Country	1925	1926	1927	1928	1929
BRITISH EMPIRE					
United Kingdom (b)	57,379	47,769	63,612	61,579	64,558
Canada	25,608	32,099	26,651	28,481	33,506
Australia	32	122	108	161	(b) 78
Union of South Africa	.....	99	29	29	.....
Total	83,019	80,089	90,400	90,250	98,142
FOREIGN COUNTRIES					
Czechoslovakia (estimated)	(a)	30,000	30,000	30,000	30,000
Finland	788	800	643	700	(a)
France	.....	18,951	15,000	(a)	(a)
Germany (Bavaria)	10,093	6,553	7,204	6,132	7,574
Italy	2,500	5,785	3,990	4,882	(a)
Japan	18,743	(a)	(a)	(a)	(a)
Norway (Exports)	26,355	20,181	27,213	23,894	26,104
Rumania	.....	1,662	1,912	2,790	2,440
Russia (fiscal years Sept. 30th)	8,477	20,629	19,019	(a)	(a)
Sweden	26,321	33,434	30,152	39,290	(a)
United States (sales)	185,706	209,989	202,497	210,811	197,699
Total	278,983	347,984	337,630	318,499	263,817
Grand total	**362,002**	**428,073**	**428,030**	**408,749**	**361,959**

* Source—Imperial Institute publications.
(a) Data not available.
(b) Including China Stone.

GRAPHITE

The first operations in the graphite industry in Canada were carried on in the province of Quebec in 1846, when a deposit of crystalline graphite was worked in Grenville township. During 1869 an estimated value of $72,000 was placed on shipments of graphite from New Brunswick and Quebec. Ten years later exports from Canada were valued at $1,167. During the three-year period 1869-1871, a property in Buckingham township, Quebec was operated with an average production of 450 tons; employment was furnished 18 men during this period. From 1888 to 1899, operations were carried on intermittently in Buckingham township, however, from that date to 1906 little work was done on these deposits. In 1916, mills at Buckingham and St. Remi d'Amherst, shipped 479 tons.

Mining and milling of graphite in Ontario had its inception in 1870 when the Port Elmsley deposit was opened up and the Oliver's Ferry refining plant was constructed. A deposit in Bedford township was operated prior to 1890 and a small quantity of crystalline graphite was produced. In 1896 another producer commenced operations, namely, the Black Donald Company. This company's deposit is located near Calabogie in Renfrew county and is the largest and richest body of graphite known in North America. Operations have been practically continuous since the opening up of this property. The graphite is shipped as refined product, the higher grades which are used in lubricating compounds, being 90 to 99 per cent pure. These products are used principally in lubricants, foundry facings, stove polishes and in the manufacture of paints for iron and steel structural work. In 1919 the N. A. Timmins deposit in North Burgess township was opened up.

The demand for Canadian graphite during the war years had its peak in 1916 and the production in that year amounted to 3,955 tons valued at $325,362. The six plants in operation employed 344 men, whose wages totalled $191,876. Although the 1917 tonnage was 241 tons less than that of the preceding year, the value received by the operators was considerably higher, the total being, $402,892. No. 1 flake graphite sold for an average of $293.80 per ton in 1917; No. 2 flake, $153.26 per ton; and amorphous and dust, $57.30 a ton.

Table 245.—Production of Graphite in Canada, by Provinces, 1920-1929

(For production from 1886 to 1919 see Mineral Production of Canada, 1928)

Year	Quebec		Ontario		Canada	
	Tons	Value	Tons	Value	Tons	Value
		$		$		$
1920	233	31,913	1,957	133,704	2,190	165,617
1921	38	2,423	899	63,439	937	65,862
1922	24	1,500	573	29,853	597	31,353
1923	45	2,316	1,068	65,557	1,113	67,873
1924	46	3,275	1,288	72,842	1,334	76,117
1925	359	30,900	2,210	127,863	2,569	158,763
1926	326	29,516	2,401	165,344	2,727	194,860
1927	34	2,043	1,795	109,613	1,829	111,656
1928	50	4,668	1,047	52,373	1,097	57,041
1929	173	12,652	1,288	90,522	1,461	103,174

Table 246.—Production in Canada, Imports and Exports of Graphite, 1927-1929

—	1927		1928		1929	
	Tons	Value	Tons	Value	Tons	Value
		$		$		$
Ore milled	7,743	.....	392	.....	5,448	.....
Production	1,829	111,656	1,097	57,041	1,461	103,174
IMPORTS—						
Crucibles, plumbago	.....	60,783	.....	55,488	.....	66,833
Plumbago, not ground or otherwise manufactured	.....	1,457	.....	4,023	.....	6,546
Plumbago, ground and manufactures of, n.o.p.	.....	60,897	.....	68,515	.....	82,391
EXPORTS—						
Graphite or plumbago, crude or refined	1,699	102,476	1,053	45,384	1,582	88,647

Table 247.—*World Production of Graphite, 1925-1929

(Long tons)

(From the Mineral Industry of the British Empire—Imperial Institute)

—	1925	1926	1927	1928	1929
BRITISH EMPIRE					
Canada	2,294	2,435	1,633	940	1,304
Australia	.....	.....	10	.....	50
Ceylon (exports)	15,426	11,623	12,884	14,347	12,739
Tanganyika Territory	.....	.....	.....	6	.....
Union of South Africa	47	46	57	50	52
India	.....	.....	.....	.....	39
Total	17,767	14,104	14,584	15,343	14,200
FOREIGN COUNTRIES					
Austria	12,868	14,523	17,773	23,843	24,897
Czechoslovakia	18,169	30,323	40,464	31,821	(a)
France	1,121	935	(a)	(a)	(a)
Germany	16,582	14,078	17,492	17,187	21,012
Italy	9,777	9,453	8,262	6,919	5,954
Norway	.....	.....	.....	.....	.....
Russia (years ended Sept. 30)	1,277	6,304	6,749	1,867	(a)
Spain	1,914	593	346	(a)	(a)
Sweden	.....	.....	.....	.....	.....
Greenland	.....	.....	(a)	.....	.....
Indo-China (French)	218	801	405	.....	(a)
Japan	994	491	623	435	(a)
Korea	13,852	15,504	17,600	22,124	24,751
Madagascar (exports)	12,796	15,651	14,526	13,680	15,795
Mexico	5,745	4,364	5,745	4,894	5,630
United States (sales)	4,165	4,884	4,649	5,010	5,766
Total	99,478	117,904	134,634	129,000	138,000
Grand total	**117,245**	**132,008**	**149,218**	**144,000**	**152,000**

(a) Information not available.

ARTIFICIAL GRAPHITE

Artificial graphite is manufactured in electric furnaces at Niagara Falls, Ontario, by the Acheson Graphite Company. The annual production over a period of fifteen years is shown in the following table:

Table 248.—Artificial Graphite made in Canada, 1914-1929

Year	Pounds	Year	Pounds	Year	Pounds
1915	497,271	1920	207,180	1925	1,291,311
1916	525,048	1921	376,508	1926	1,246,291
1917	1,096,172	1922	724,524	1927	1,187,011
1918	1,808,698	1923	1,554,376	1928	830,680
1919	358,524	1924	816,455	1929	1,149,920

GYPSUM

Gypsum production from Canadian deposits during 1929 amounted to 1,211,689 tons valued at $3,345,696 as compared with the high record for the industry of 1,246,368 tons worth $3,743,648 set up in 1928. Gypsum quarried during 1929 totalled 1,225,728 tons of which quantity 248,000 tons or 20·2 per cent was calcined in Canada.

Canadian production was obtained from quarries in Hants, Inverness, and Victoria counties, N.S.; Albert and Victoria counties, N.B.; near Paris, Ontario; Gypsumville, Manitoba; and in the Fort Steele, Kamloops and Clinton mining divisions, B.C.

Approximately 92 per cent of the Nova Scotia production was shipped as crude gypsum to the United States during 1929. Two plants were operated in this province for the calcining of gypsum. At Windsor, N.S., hardwall and selenite plasters were produced; these products were shipped to various points in the Maritime Provinces and some as far west as Montreal; shipments were also made to Newfoundland and New Zealand. A plant at Iona, N.S. produced plaster of Paris, hardwall plaster, stucco and dental plaster; the Maritimes, Quebec and Ontario provided the principal market for these products although some shipments were made to the United States and to New Zealand.

The New Brunswick output consisted of a very pure quality gypsum produced from deposits at Hillsborough. Hardwall, finishing and dental plasters were produced at Hillsborough and marketed throughout Canada and in the United States. Finishing plasters were also exported to New Zealand, Australia, South Africa, and the British West Indies. In addition to these products, shipments of crude gypsum were made to the United States. Small shipments of land plaster were made from a quarry at Plaster Rock, N.B.

Ontario's production consisted of crude and calcined gypsum produced at Caledonia and Lythmore.

In Manitoba crude gypsum was obtained from deposits at Gypsumville, 170 miles north of Winnipeg. This crude material was shipped to Winnipeg for processing.

British Columbia's production was extracted from quarries at Falkland, Mayook and Kelly Lake. Shipments from Mayook consisted of crude gypsum for use in the manufacture of cement. The Falkland gypsum was shipped to a gypsum products plants at Port Mann. Gypsite was obtained from several deposits located near Kelly Lake, on the Pacific Great Eastern Railway.

Exports of crude gypsum during 1929 amounted to 893,445 tons; this tonnage was shipped the United States. Ground gypsum and prepared wall plaster exported during the year totalled 7,938 tons and consisted of shipments principally to New Zealand, the United States, Newfoundland and Australia.

Table 249.—Annual Production of Gypsum in Canada, by Provinces, 1920-1929

(For the years 1874 to 1919 see Mineral Production of Canada, 1928)

Year	Nova Scotia		New Brunswick		Ontario		Manitoba		British Columbia		Canada	
	Tons	Value	Tons	Value	Tons	Value	Tons	Value	Tons	Value	Tons	Value
		$		$		$		$		$		$
1920..	260,661	573,752	49,405	428,183	74,707	404,162	44,371	487,894	.....	.....	429,144	1,893,991
1921..	206,831	511,883	54,030	360,220	84,790	433,053	40,859	480,282	40	100	386,550	1,785,538
1922..	332,404	580,148	82,462	517,668	110,227	621,668	34,072	440,914	100	500	559,265	2,160,898
1923..	341,705	747,934	104,740	564,680	99,958	542,317	31,575	386,554	323	1,615	578,301	2,243,100
1924..	441,752	915,845	86,738	476,804	88,121	467,007	29,375	348,212	30	150	646,016	2,208,108
1925..	551,230	1,070,408	71,745	408,917	82,020	491,833	35,088	417,868	240	865	740,323	2,389,891
1926..	678,107	1,187,918	59,546	468,411	89,987	496,059	35,172	461,461	20,916	156,964	883,728	2,770,813
1927..	829,438	1,512,015	85,293	524,550	83,998	500,688	39,895	512,008	24,493	201,754	1,064,117	3,251,015
1928..	1,013,257	1,850,243	75,033	501,252	85,811	553,271	51,285	609,039	20,982	229,843	1,246,368	3,743,648
1929 .	948,895	1,152,160	70,482	485,982	100,347	832,689	67,269	631,051	24,696	243,814	1,211,689	3,345,696

Table 250—Summary of Statistics on Gypsum in Canada, 1927-1929

—	1927		1928		1929	
	Tons	Value	Tons	Value	Tons	Value
		$		$		$
Crude gypsum mined	1,105,704	.....	1,311,642	.....	1,225,728	.....
Crude gypsum calcined	196,232	.....	226,997	.....	218,005	.....
PRODUCTION BY GRADES—						
Crude—						
Lump	225,264	371,488	43,224	80,467	44,818	90,071
Crushed	665,499	1,223,070	1,018,172	1,770,077	964,875	1,147,289
Fine ground	7,065	42,633	9,576	55,170	2,201	17,271
Calcined	165,289	1,613,824	175,396	1,837,934	199,765	2,091,065
Total	**1,063,117**	**3,251,015**	**1,246,368**	**3,743,648**	**1,211,689**	**3,345,696**
PRODUCTION BY PROVINCES—						
Nova Scotia	829,438	1,512,015	1,013,257	1,850,243	918,835	1,152,160
New Brunswick	85,293	524,550	75,033	501,252	70,482	485,982
Ontario	83,998	501,688	85,811	553,271	100,347	832,689
Manitoba	39,895	512,098	51,285	609,039	67,269	631,051
British Columbia	24,493	201,754	20,982	229,843	24,696	243,814
Total	**1,063,117**	**3,251,015**	**1,246,368**	**3,743,648**	**1,211,689**	**3,345,606**
IMPORTS—						
Gypsum, crude (sulphate of lime)*	1,092	42,741	1,097	40,312	1,244	18,671
Plaster of Paris, or gypsum ground not calcined	111	2,996	256	7,379	165	5,283
Plaster of Paris, or gypsum calcined and prepared wall plaster	7,016	101,823	10,563	142,550	16,356	189,438
Total	**8,219**	**147,560**	**11,916**	**193,241**	**17,765**	**213,392**
EXPORTS—						
Gypsum or plaster crude	588,808	959,858	824,536	1,240,987	893,445	1,086,939
Plaster of Paris, ground and prepared wall plaster	6,556	113,049	8,232	140,946	7,938	137,046
Total	**595,364**	**1,072,907**	**832,768**	**1,381,933**	**901,383**	**1,223,985**

* Consists of crown filler and anhydrous sulphate of lime.

Table 251.—Capital Employed in the Gypsum Industry in Canada by Provinces, 1928 and 1929

—	1928			1929		
	Nova Scotia	New Brunswick, Ontario, Manitoba and British Columbia	Canada	Nova Scotia	New Brunswick, Ontario, Manitoba and British Columbia	Canada
CAPITAL EMPLOYED AS REPRESENTED BY—	$	$	$	$	$	$
Cost of lands, buildings, machinery and tools	4,440,028	2,019,119	6,459,147	3,822,349	2,415,357	6,237,706
Cost of all supplies and stocks on hand	417,152	220,728	637,880	396,096	279,878	675,974
Cash, trading and operating accounts and bills receivable	76,390	861,893	938,293	307,027	217,898	524,925
Total	**4,933,570**	**3,101,740**	**8,035,310**	**4,525,472**	**2,913,133**	**7,438,605**

Table 252.—Employees, Salaries and Wages in the Gypsum Industry in Canada, 1928 and 1929

—	1928				1929			
	Number			Salaries and wages	Number			Salaries and wages
	Male	Female	Total		Male	Female	Total	
				$				$
Salaried employees	57	18	75	180,870	58	13	71	175,256
Wage-earners—								
Mine	733	.....	733	.....	622	.....	622	.....
Mill	351	.....	351	.....	293	1	294	.....
Total	1,084	.....	1,084	990,944	915	1	916	878,957
Grand total	**1,141**	**18**	**1,159**	**1,171,814**	**973**	**14**	**987**	**1,054,213**

Table 253.—Wage-Earners in the Gypsum Industry in Canada by Provinces and by months, 1929

Month	Nova Scotia		New Brunswick, Ontario, Manitoba and British Columbia		Canada	
	Mine	Mill	Mine	Mill	Mine	Mill
January	172	32	153	243	325	275
February	172	30	155	225	327	255
March	165	30	189	213	354	243
April	295	30	192	247	487	277
May	464	33	240	266	704	299
June	455	51	240	283	695	334
July	514	36	229	289	743	325
August	521	36	231	275	752	311
September	568	36	222	249	790	285
October	540	36	195	261	735	297
November	440	34	183	247	623	281
December	255	30	150	246	405	276

Table 254.—*World Production of Gypsum 1925-1929

(Long tons)

(From the Mineral Industry of the British Empire—Imperial Institute)

Country	1925	1926	1927	1928	1929
British Empire					
United Kingdom	414,529	465,191	506,350	634,645	967,491
Canada (shipments)	661,003	789,043	949,211	1,112,829	1,081,592
Union of South Africa	7,123	(b) 11,029	(b) 15,187	14,637	16,973
Cyprus (shipments)	24,193	17,677	15,139	(b) 11,426	12,555
Palestine	.....	.....	1,140	1,341	1,475
India	36,244	34,473	38,105	59,050	52,726
Australia	90,150	80,565	122,842	118,867	15,707
Total	1,233,242	1,397,978	1,647,974	1,952,795	2,150,000
Foreign Countries					
Austria (exports less imports)	24,067	21,741	24,799	28,100	†50,000
Esthonia	3,821	4,751	11,979	7,856	9,835
France	2,293,000	2,412,900	2,040,240	(a)	(a)
Germany (Bavaria)	57,352	44,956	58,779	53,622	59,241
Greece	9,898	9,158	1,982	.....	(a)
Italy (including alabaster)	662,707	645,194	663,287	640,587	(a)
Jugoslavia (Serbia only)	.....	610	1,046	1,152	1,585
Luxemburg	24,556	33,447	7,724	2,466	7,092
Rumania	52,994	43,616	76,496	47,030	75,414
Russia (years ended Sept. 30)	166,353	303,295	278,532	(a)	(a)
Spain (exports)	2,958	719,816	896,950	1,037,368	(a)
Sweden	.....	135	88	114	(a)
Algeria	71,700	72,408	72,000	76,349	101,394
United States	5,066,964	5,031,644	4,774,007	4,555,580	4,478,689
Argentina (exports)	1,833	(a)	51,128	40,949	(a)
Chile	8,310	6,880	8,245	8,969	(a)
Peru	14,413	11,521	9,891	15,388	19,830
China (exports)	6,984	3,721	2,431	3,214	3,098
Japan	152,736	260,803	74,306	67,433	(a)
Philippine Islands	.....	381	(a)	(a)	(a)
Egypt	.....	.....	130,000	130,000	130,000
Total	8,620,646	9,626,977	9,200,000	9,100,000	(a)
Grand total	**9,853,888**	**11,024,955**	**10,900,000**	**11,100,000**	(a)

(a) Data not available.
(b) Shipments.
† Estimated.

IRON OXIDES

In 1851, an important deposit of ochre was worked at Pointe du Lac, St. Maurice county, Quebec, and shipments of dried ochre were made to the United States, subsequently this property was abandoned. Thirty-two years later the manufacture of dry ochre was commenced on a small scale in Iberville township on the Little Romaine river. This deposit was later abandoned but in 1916 it was re-opened and a small quantity of crude ochre was taken out for use as a pigment in the paper industry. A deposit was opened up at St. Malo, Champlain county, in 1885 and a calcining plant erected. Calcined ochre was shipped from this mill to Montreal where it was further prepared for use in the manufacture of paint.

Deposits of iron oxides in the Three Rivers district, Quebec, are important. The Canada Paint Company Limited, operates a large plant at Red Mill for calcining, washing and grinding pigments.

About 1½ miles east of Red Mill, the Champlain Oxide Company operated a calcining plant. No shipments have been made from this plant since 1923.

For a number of years Thos. H. Argall operated a calcining plant near the Champlain mill. Operations ceased, however, due to labour troubles and this producer opened up another deposit at Pointe-du-Lac from which crude iron oxides are shipped for use in the purifying of illuminating gas.

The Montmorency Paint Products Co., have operated a deposit at Beaupré, Pelletier township, Quebec for several years.

Prior to 1911 small quantities of ochre were produced intermittently from a deposit at Campbellville, Halton county, Ontario. No production has been recorded in this province since that date.

In 1921 a trial shipment of bog iron ore was made from Alta lake, British Columbia. The following year an experimental consignment was sent to Calgary by a small operator in the Windermere district, British Columbia. Shipments totalling 500 tons were made from these two deposits during 1923. There has been a small annual production during the past five years.

The Canadian production of iron oxides is marketed in two forms, namely, crude and calcined. Crude oxides are dried before shipment, and are mostly used in the purification of illuminating gas, while the calcined product is ground usually for consumption in the paint industry.

Table 255.—Production of Iron Oxides in Canada, 1920-1929

(For the Years 1886 to 1919 see Mineral Production of Canada, 1928)

Year	Tons	Value	Year	Tons	Value
		$			$
1920	19,128	157,909	1925	7,118	91,913
1921	9,048	93,610	1926	6,626	101,843
1922	7,285	110,608	1927	6,125	103,536
1923	10,424	129,636	1928	5,414	111,198
1924	7,266	91,160	1929	6,518	115,932

Table 256.—Production in Canada, Imports and Exports of Iron Oxides, 1927-1929

—	1927		1928		1929	
	Tons	Value	Tons	Value	Tons	Value
		$		$		$
Production	6,125	103,536	5,414	111,198	6,518	115,932
Imports—						
Ochres, ochrey earths, siennas, and umbers	2,654	90,614	3,279	111,751	3,495	121,698
Oxides, fire proofs, rough stuffs, fillers and colours, dry, n.o.p.	3,356	632,470	3,485	709,539	3,683	790,654
Exports—						
Mineral pigments, iron oxides and ochres	852	34,800	1,124	44,342	1,113	42,554

Table 257.—Capital Employed in the Iron Oxides Industry in Canada, 1928 and 1929

—	1928	1929
	$	$
CAPITAL EMPLOYED AS REPRESENTED BY—		
Cost of lands, buildings, machinery and tools	134,854	133,736
Cost of supplies and stocks on hand	18,924	24,645
Cash, trading and operating accounts and bills receivable	473	1,142
Total	**154,251**	**159,523**

Table 258.—Employees, Salaries and Wages in the Iron Oxides Industry in Canada, 1928 and 1929

Class	1928		1929	
	Number of employees	Salaries and wages	Number of employees	Salaries and wages
		$		$
Salaried employees	3	4,074	2	3,560
Wage-earners	42	34,760	46	43,764
Grand total	**45**	**38,834**	**48**	**47,324**

Table 259.— Wage-Earners in the Iron Oxides Industry in Canada, by Months, 1928 and 1929

Month	Number		Month	Number	
	1928	1929		1928	1929
January	23	23	July	43	49
February	23	23	August	49	53
March	23	29	September	46	53
April	23	29	October	48	52
May	28	45	November	38	39
June	39	44	December	37	28

MICA

Important deposits of mica in Canada are located in the counties of Hull and Labelle in Quebec, and Lanark, Leeds and Frontenac in Ontario. The product of these mines, in the main part, is shipped first to mica-trimming shops, conveniently located, where it is either rough-cobbed or split and trimmed prior to exportation to the United States or Great Britain.

Mica from the island of Madagascar, the main source of phlogopite outside of Canada, is being imported into the United States, Canada's principal market, at a price below that at which the Canadian operator can afford to sell. Imports into Canada of mica and mica in manufactured form from both the United States and British India increased during the year.

Rough cobbed and thumb-trimmed mica exported amounted to 2 tons; splittings, 91 tons; and scrap and waste, 4,789 tons. The total value of Canadian mica exported during 1929 was $213,059, which included shipments worth $209,300 to the United States and $2,228 to the United Kingdom.

It will be noted that the stated value of the exports of Canadian mica exceeded by a considerable amount the value placed on shipments reported by operators. An explanation of this, lies in the fact, that a large percentage of the value of exported material consisted of mica splittings shipped from large trimming shops situated in Ontario and Quebec.

Table 260.—Production of Mica in Canada, by Provinces, 1920-1929

(For the years 1886 to 1919 see Mineral Production of Canada, 1928)

Year	Quebec		Ontario		Canada	
	Tons	Value	Tons	Value	Tons	Value
		$		$		$
1920	737	281,460	1,466	94,562	2,203	376,022
1921	484	41,172	218	28,891	702	70,063
1922	1,360	97,748	1,989	54,515	3,349	152,263
1923	1,545	216,684	1,980	110,290	3,525	326,974
1924	1,677	185,020	2,414	172,252	4,091	357,272
1925	2,415	178,800	1,605	82,663	4,020	261,463
1926	1,664	170,118	881	59,086	2,545	229,204
1927	1,454	99,194	1,284	75,183	2,738	174,377
1928	1,101	54,224	2,559	32,944	3,660	87,168
1929	1,062	72,630	2,991	45,919	4,053	118,549

Table 261.—Production of Mica in Canada by Grades, 1928 and 1929

—	1928			1929		
	Pounds	Value f. o. b. shipping point	Price per pound	Pounds	Value f. o. b. shipping point	Price per pound
		$	$		$	$
Rough cobbed	.....	.....	.....	.....	.....	.....
Thumb-trimmed	91,662	16,887	0·18	97,331	17,131	0·18
Splittings only	25,367	14,974	0·59	22,750	13,732	0·60
Scrap	7,202,795	55,307	0·008	7,986,878	87,686	0·01
Total	**7,319,824**	**87,168**	**0·01**	**8,106,959**	**118,549**	**0·015**

Table 262.—Production in Canada, Imports and Exports of Mica, 1927-1929

—	1927		1928		1929	
	Tons	Value	Tons	Value	Tons	Value
		$		$		$
PRODUCTION—						
Quebec	1,454	99,194	1,101	54,224	1,062	72,630
Ontario	1,284	75,183	2,559	32,944	2,991	45,919
Total	**2,738**	**174,377**	**3,660**	**87,168**	**4,053**	**118,549**
IMPORTS—						
Mica and manufactures of, n.o.p.	.....	97,000	.....	135,301	.....	169,018
EXPORTS—						
Rough cobbed and thumb-trimmed	165	54,937	32	15,951	2	1,342
Splitting	159	213,651	84	89,932	91	96,726
Scrap and waste	4,536	57,499	4,346	78,262	4,789	112,905
Plate and manufactures (micanite)	.....	759	.....	616	.....	2,086
Total	.....	**326,846**	.....	**175,761**	.....	**213,059**

Table 263.—Capital Employed in the Mica Mining Industry in Canada, by Provinces, 1928 and 1929

—	1928			1929		
	Quebec	Ontario	Canada	Quebec	Ontario	Canada
	$	$	$	$	$	$
CAPITAL EMPLOYED AS REPRESENTED BY—						
Cost of lands, buildings, machinery and tools	97,351	27,842	125,193	157,887	29,037	186,924
Cost of supplies and stocks on hand	58,408	10,160	68,568	46,803	5,147	51,950
Cash, trading and operating accounts and bills receivable	49,017	17,296	66,313	39,921	2,500	42,421
Total	**204,776**	**55,298**	**260,074**	**244,611**	**36,684**	**281,295**

Table 264.—Wage-Earners in the Mica Mining Industry in Canada, by Months, 1928 and 1929

Month	Number		Month	Number	
	1928	1929		1928	1929
January	69	37	July	52	83
February	68	41	August	51	87
March	71	42	September	44	100
April	59	38	October	49	71
May	52	73	November	50	39
June	51	89	December	60	18

Table 265.—Employees, Salaries and Wages in the Mica Mining Industry in Canada, 1928 and 1929

—	1928		1929	
	Number of employees	Salaries and wages	Number of employees	Salaries and wages
		$		$
Salaried employees	6	6,480	5	11,116
Wage-earners	88	35,679	78	36,246
Total	**94**	**42,159**	**83**	**47,362**

Table 266.—World Production of Mica, 1925-1929

(From the Mineral Industry of the British Empire—Imperial Institute)

(Long tons)

Country	1925	1926	1927	1928	1929
British Empire					
Canada (shipments)	3,589	2,272	2,445	3,197	3,752
India (exports)	4,985	4,497	3,874	4,774	5,804
Northern Rhodesia	.....	4	8	4	3
Southern Rhodesia	130	163	(b) 183	183	169
Tanganyika Territory	68	52	42	33	29
Union of South Africa	1,054	1,130	1,660	3,572	1,525
Ceylon	1	(a)	.....	.....	1
Australia	4	11	5	12	27
Total	9,831	8,129	8,217	11,775	11,310
Foreign Countries					
United States (sales)	9,457	7,258	6,282	7,680	[illegible]
Madagascar	282	325	497	625	[illegible]
Argentina (exports)	117	83	75	118	(a)
Brazil	64	51	39	74	(a)
France (lithium mica)	.....	246	(a)	(a)	(a)
Japan	1,065	(a)	(a)	(a)	(a)
Germany (lithium mica)	493	654	(a)	265	(a)
Guatemala	16	12	7	13	(a)
Chosen (Korea)	20	16	(a)	45	41
Norway	23	41	8	84	58
Portugal (lithium mica)	.....	184	379	336	740
Russia (years ended Sept. 30)	190	478	1,496	96	(a)
Sweden	93	52	10	12	(a)
Total	11,820	9,400	8,793	9,348	7,750
Grand total	**21,651**	**17,529**	**17,010**	**21,194**	**18,927**

(a) Data not available.
(b) In addition 19 tons of lithium mica were produced.

QUARTZ

Quartz production in Canada, prior to 1906, was not remunerative enough to cause much activity in this industry. The earliest record available show that in 1890 a shipment of 200 tons valued at $1,000 was made from a Quebec deposit. Small shipments were recorded in 1893, 1896, 1898 and 1899. During 1906 production commenced for the purpose of supplying flux and furnace linings to the industries in the Sudbury district of Ontario. Shipments from the Ontario quarries have been continuous since that date.

Quartz for use as a flux was produced in Ontario and British Columbia. Silica sand for the manufacture of silica brick was obtained from deposits in Nova Scotia and Ontario. Considerable tonnages of silica sand were shipped from Quebec and Manitoba deposits for use in the manufacture of glass. Some shipments of quartz were made from Quebec quarries to chemical works during 1929.

Imports into Canada of silex or crystallized quartz totalled 3,995 tons evaluated at $79,653; in 1928 the imports were recorded at 2,865 tons at $73,755. Flint importations in 1929 reached a total of 3,595 tons appraised at $39,272, as agaisnt 3,545 tons worth $36,204 imported in the preceding year. Silex was obtained principally from the United States; flint was imported mainly from France and the United States.

Capital employed in the operation of the 20 quarries active during 1929 totalled $1,000,232. Employment was furnished 279 salaried employees and wage-earners, whose combined earnings amounted to $189,541. Fuel used during the year cost $27,340.

Table 267.—Production of Quartz in Canada, 1920-1929

(For the years 1890 to 1919 see Mineral Production of Canada, 1928)

Year	Tons	Value	Year	Tons	Value
		$			$
1920	128,295	467,821	1925	197,224	363,612
1921	100,350	312,947	1926	232,682	553,161
1922	109,947	208,598	1927	233,984	496,364
1923	264,076	599,250	1928	282,522	523,933
1924	150,896	323,156	1929	265,949	561,527

Table 268.—Production in Canada, and Imports of Quartz, 1927-1929

—	1927		1928		1929	
	Tons	Value	Tons	Value	Tons	Value
		$		$		$
PRODUCTION—						
Nova Scotia	4,834	16,721	7,424	28,022	11,845	31,388
Quebec	49,141	132,015	64,577	143,067	46,444	132,532
Ontario	159,150	266,204	194,503	308,608	187,973	316,050
Manitoba	.....	.....	*1	360	10,045	35,610
British Columbia	20,859	80,824	16,017	43,876	9,642	45,947
Total	**233,984**	**496,364**	**282,522**	**523,933**	**265,949**	**561,527**
IMPORTS—						
Silex or crystallized quartz, ground or unground	3,188	75,230	2,865	73,755	3,995	79,653
Flint	4,311	46,551	3,545	36,204	3,595	39,272

*Rose Quartz.

Table 269.—Capital Employed in the Quartz Mining Industry in Canada, 1928 and 1929

—	1928	1929
	$	$
CAPITAL EMPLOYED AS REPRESENTED BY—		
Cost of lands, buildings, machinery and tools	1,090,256	900,387
Cost of supplies and stocks on hand	51,246	79,581
Cash, trading and operating accounts and bills receivable	17,583	20,264
Total	**1,159,085**	**1,000,232**

Table 270.—Employees, Salaries and Wages in the Quartz Mining Industry in Canada, 1928 and 1929

—	1928				1929			
	Number			Salaries and wages	Number			Salaries and wages
	Male	Female	Total		Male	Female	Total	
				$				$
Salaried employees	15	2	17	24,881	17	1	18	22,311
Wage-earners	241	.....	241	197,788	261	.....	261	167,140
Total	256	2	258	222,672	278	1	279	189,451

Table 271.—Wage-Earners in the Quartz Mining Industry in Canada, by Months, 1928 and 1929

Month	1928	1929	Month	1928	1929
January	106	95	July	224	208
February	129	101	August	238	212
March	96	95	September	207	180
April	110	121	October	188	161
May	174	212	November	124	129
June	196	225	December	103	81

SALT

The production of salt in the province of Ontario was first recorded in 1866 when a company was formed to drill for oil on the north bank of the Maitland river, and, while no success attended the efforts of the drillers in their search for oil, a bed of rock salt was found at a depth of 964 feet. In September, 1866, this company (incorporated under the name of the *Godrrich Petroleum Company*, later changed to *Goderich Salt Company*) commenced pumping brine. In the initial working in connection with these deposits the refining was done by the kettle method, which was soon discarded and replaced by the pan method of evaporation. Wells were drilled and plants erected at Clinton and Seaforth, Ontario, and four refineries were in operation at Goderich in 1879; at the present time there only two firms operating at Goderich.

Census reports show that there were 16 salt works in operation in Ontario and 2 in Nova Scotia during 1871. The Ontario plants employed 175 men with a total wage of $60,990 while the products made were valued at $119,999. In Nova Scotia during that year there were 10 employees who received $2,040 and the total value of the plant production was $16,600. According to the 1881 census, 26 plants were in operation in Ontario and 1 each in Nova Scotia and New Brunswick. Total employees that year numbered 247 earning $78,517; products made were valued at $395,848 and the capital invested in the operating plants was $298,100. The development of the industry has reached the point where in 1929 the 8 plants in operation reported a capital investment of $4,576,543 and the number of employees was 424 who received salaries and wages amounting to $546,453.

Salt production in Canada established a new high mark in 1929, the output being 330,264 tons valued at $1,578,086, an increase of 10·3 per cent in quantity and 5·5 per cent in value over the 1928 total of 299,445 tons at $1,495,971. Shipments in 1929, exclusive of the salt content of brine used in the manufacture of chemicals, averaged $8.70 per ton as compared with $8.28 per ton in the previous year.

An increase of 8 per cent was recorded in Ontario's production; the total for 1929 was 302,445 tons or 91·6 per cent of the Canadian production. Output from the Malagash mine Nova Scotia continues to advance and the 1929 production was 42 per cent higher than the total in the previous year.

Canadian imports of salt decreased 6·6 per cent to 176,566 tons with a value of $936,820. Salt exported from Canada amounted to 9,359 tons evaluated at $70,762 as compared with 2,930 tons worth $36,399 exported last year.

Table 272.—Production of Salt in Canada, 1920-1929

(For the years 1886 to 1929 see Mineral Production of Canada, 1928)

Year	Tons	Value	Year	Tons	Value
		$			$
1920	209,855	1,544,724	1925	233,746	1,410,697
1921	164,658	1,673,685	1926	262,547	1,480,149
1922	181,794	1,628,323	1927	268,672	1,614,667
1923	202,397	1,713,516	1928	299,445	1,495,971
1924	207,979	1,374,780	1929	330,264	1,578,086

Table 273.—Production of Salt in Canada, by Grades, 1928 and 1929

Grade	1928			1929		
	Manufactured	Sold	Value of salt sold (Not including packages)	Manufactured	Sold	Value of salt sold (Not including packages)
	Tons	Tons	$	Tons	Tons	$
Table and dairy	56,252	56,214	708,927	54,618	54,138	785,559
Common fine	52,112	51,055	258,781	49,538	49,869	235,335
Common coarse	47,328	46,146	311,301	50,399	50,383	322,600
Land salt	3,662	3,685	17,798	1,407	1,919	7,209
Other grades	7,019	7,207	63,874	5,875	5,628	58,607
Brine for chemical works (Salt equivalent sold or used)	135,138	135,138	135,290	168,327	168,327	168,776
Total	**301,511**	**299,445**	**1,495,971**	**330,164**	**330,264**	**1,578,086**
Value of packages	.....	.....	560,822			543,022
Grand total	.....	.....	**2,056,793**	.....	.....	**2,121,108**

Table 274.—Production in Canada, Imports, Exports and Consumption of Salt, 1927-1929

—	1927		1928		1929	
	Tons	Value	Tons	Value	Tons	Value
		$		$		$
PRODUCTION	268,672	1,614,667	299,445	1,495,971	330,264	1,578,086
IMPORTS—						
Salt, for the use of the sea or gulf fisheries	62,102	328,824	74,192	417,591	82,530	370,211
Salt, in bulk, n.o.p.	72,933	321,534	68,765	254,218	54,997	208,130
Salt, n.o.p., in bags, barrels, etc.	40,832	376,648	45,589	416,149	38,794	342,302
Salt, table, made by an admixture of other ingredients, when containing not less than 90 per cent of pure salt. (From April 1, 1926)	844	55,070	479	35,007	245	16,177
Total	**176,761**	**1,082,080**	**189,025**	**1,122,968**	**176,566**	**936,820**
EXPORTS	1,212	22,793	2,930	36,399	9,359	70,762
APPARENT CONSUMPTION OF SALT	444,221	2,673,954	485,510	2,582,540	497,471	2,444,144

Table 275.—Capital Employed in the Salt Industry in Canada, 1928 and 1929

—	1928	1929
	$	$
CAPITAL EMPLOYED AS REPRESENTED BY—		
Cost of lands, buildings, machinery and tools	3,731,953	3,865,994
Cost of supplies and stocks on hand	235,405	334,338
Cash, trading and operating accounts and bills receivable	455,564	376,211
Total	**4,422,922**	**4,576,543**

Table 276.—Employees, Salaries and Wages in the Salt Industry in Canada, 1928 and 1929

—	1928				1929			
	Number of employees		Total	Salaries and wages	Number of employees		Total	Salaries and wages
	Male	Female			Male	Female		
				$				$
Salaried employees	45	15	61	117,376	41	12	53	102,502
Wage-earners	394	.....	394	422,399	329	42	371	413,951
Total	**439**	**16**	**455**	**539,775**	**370**	**54**	**424**	**516,453**

Table 277.—Wage-Earners in the Salt Industry in Canada, by Months, 1928 and 1929

Month	1928		1929		Month	1928		1929	
	Male	Female	Male	Female		Male	Female	Male	Female
January	316	30	263	39	July	380	33	339	43
February	342	31	313	39	August	377	34	335	47
March	346	34	340	41	September	347	4[illegible]	335	45
April	365	37	365	39	October	340	39	350	46
May	401	34	361	40	November	351	31	303	44
June	377	37	344	42	December	330	37	290	43

Table 278.—World Production of Salt, 1925-1929

(From the "Mineral Industry of the British Empire"—Imperial Institute)

(Long tons)

Country	1925	1926	1927	1928	1929
British Empire					
United Kingdom	1,933,590	1,727,443	1,983,486	1,946,318	1,974,170
Mauritius (estimated)†	1,500	1,500	1,500	1,500	1,500
Nigeria (estimated)	400	400	400	400	400
Somaliland (exports)†	2,336	2,077	2,367	1,678	3,100
South-West Africa Territory	425	357	338	144	334
Anglo-Egyptian Sudan	9,000	9,194	9,716	12,284	14,715
Tanganyika Territory	4,000	3,105	4,775	5,053	7,270
Uganda	.....	1,715	2,017	2,034	2,244
Union of South Africa (years ended June 30)	58,333	79,245	79,146	82,412	(a) [illegible]
Canada (shipments)	208,702	234,417	239,886	269,206	294,789
West Indies (exports)†—					
Bahamas	1,291	7,400	1,900	700	800
Turks & Caicos Islands	62,432	53,958	27,923	50,043	61,153
Ceylon	20,263	15,962	25,668	43,576	(a)
Cyprus (estimated)	3,000	3,000	3,000	3,000	3,000
India (including Aden)	1,295,144	1,638,749	1,611,945	1,515,349	1,709,099
Weihaiwei (estimated)	2,000	2,000	2,000	2,000	2,000
Palestine	.....	.....	.....	1,628	2,468
Australia	126,251	139,101	123,212	130,785	84,457
Total	3,728,667	3,919,623	4,119,279	4,100,000	4,161,499
Foreign Countries					
Italian East Africa	.....	.....	67,000	100,000	(a)
Angola (estimated)	.....	.....	10,000	10,000	10,[illegible]
Austria	128,705	142,849	145,741	151,389	175,[illegible]
Bulgaria	25,000	.....	3,919	4,043	3,[illegible]
Czechoslovakia	75,591	96,556	120,272	151,678	(a)
France	(b) 1,327,049	(b) 1,617,405	1,315,300	1,571,699	(b) 1,486,435
Germany	2,188,347	2,406,772	2,758,524	2,863,384	2,904,461
Greece	3,507	88,309	102,730	(c) 57,661	(a)
Italy	900,922	754,150	1,030,475	889,121	(a)
Jugoslavia	53,638	51,435	53,900	51,305	(a)
Netherlands	34,191	34,894	37,439	40,815	44,205
Poland	423,197	450,646	530,694	560,337	560,000
Portugal	.....	54	21	31	28
Rumania	325,139	338,628	322,847	337,365	316,422
Russia	1,404,862	1,823,344	2,387,651	2,286,563	(a)
Spain	846,556	1,079,939	963,754	967,533	(a)
Switzerland	73,954	76,047	77,026	78,719	85,110
Algeria	26,579	42,534	36,353	10,802	15,063

Table 278.—World Production of Salt, 1925-1929—Concluded

(From the "Mineral Industry of the British Empire"—Imperial Institute)

(Long tons)

Country	1925	1926	1927	1928	1929
FOREIGN COUNTRIES—Concluded					
Belgian Congo (estimated)	80	80	80	80	80
Panama (estimated)	.....	.....	50,000	50,000	50,000
Egypt (exports)	207,795	177,394	219,020	165,222	146,669
Eritrea (estimated)	20,000	20,000	20,000	20,000	(a)
French Morrocco	.....	1,200	3,500	(a)	(a)
French Somaliland	.....	31,474	16,381	28,272	38,356
French West Africa (Mauritania)	.....	4,400	4,200	4,000	(a)
Tripoli (estimated)	19,000	19,000	19,000	19,000	19,000
Tunis	126,378	130,978	142,501	(a)	(a)
Dutch West Indies (exports)	18,087	9,999	8,088	(a)	(a)
Mexico (estimated)	66,000	66,000	66,000	66,000	66,000
United States	6,604,909	6,581,786	6,757,759	7,209,553	7,628,179
Argentina (railway shipments)	74,160	95,128	150,793	164,970	(a)
Chile	28,863	34,352	70,419	34,197	(a)
Colombia (estimated)	29,000	29,000	29,000	29,000	29,000
Peru	23,002	29,638	29,695	32,222	(a)
Venezuela (estimated)	30,000	30,000	30,000	30,000	30,000
China including Kwantung Peninsula (estimated)	2,000,000	2,000,000	2,194,188	2,400,570	2,408,019
Dutch East Indies	434,364	375,173	247,484	238,298	(a)
Formosa	136,000	133,059	111,600	116,513	(a)
French Indo-China (exports)	5,861	20,152	27,203	35,249	25,231
Japan	657,935	710,528	1,067,944	627,813	(a)
Portuguese India (estimated)	12,000	12,000	12,000	12,000	12,000
Siam	124,094	123,685	113,534	117,447	(a)
Turkey (Anatolia) (estimated)	100,000	100,000	100,000	100,000	100,000
Philippine Islands	30,120	23,695	65,616	(a)	(a)
Total	18,584,885	19,762,283	22,000,000	22,000,000	23,000,000
Grand total	**22,313,552**	**23,681,906**	**26,000,000**	**26,000,000**	**27,000,000**

(a) Data not available.
(b) Exclusive of sea salt.
(c) Sales.
†Sea salt.

TALC AND SOAPSTONE

Shipments of talc and soapstone ranging from 50 tons to 1,420 tons were made from Canadian deposits during the period 1886 to 1906. Prior to 1900 the production consisted mainly of impure talc and soapstone shipped from Quebec. It was not until 1900 that mining operations were commenced on the high grade talc deposits of the Madoc district. Ground talc was shipped from this district in 1906. Production advanced during the ensuing years until 1920 the high mark for the industry was reached, namely 21,671 tons valued at $166,934, an average of $7.70 per ton. In the following year the 4 companies operating employed 34 men and produced 10,124 tons with an average value of $14.28 per ton. During 1929, the 5 firms operating in this industry employed 86 persons.

The Quebec production consisted of soapstone blocks and powder shipped from a quarry in Broughton township. Ontario operators near Madoc, Hastings county, shipped 15,463 tons of talc during the year. A small shipment was made from a talc deposit in the Lillooet mining division, B.C.

Table 279.—Production of Talc and Soapstone in Canada, 1920-1929

(For the years 1886 to 1919 see Mineral Production of Canada, 1928)

Year	Tons	Value	Year	Tons	Value
		$			$
1920	21,671	166,934	1925	14,474	205,835
1921	10,124	144,565	1926	15,767	217,195
1922	13,195	188,458	1927	16,521	236,105
1923	10,366	150,507	1928	16,058	219,358
1924	11,332	154,480	1929	15,509	229,198

Table 280.—Production in Canada, Imports and Exports of Talc and Soapstone, 1927-1929

—	1927		1928		1929	
	Tons	Value	Tons	Value	Tons	Value
		$		$		$
PRODUCTION—						
Soapstone	1,411	57,174	.....	40,171	.....	47,986
Talc	15,110	178,931	14,925	179,187	15,509	181,212
Total	**16,521**	**236,105**	.....	**219,358**	.....	**229,198**
IMPORTS—						
Talc or soapstone, ground or unground	4,907	86,858	5,421	91,702	5,516	109,675
EXPORTS—						
Talc, crude	12	154	10,946	133,601	11,399	139,096
Talc, refined	10,692	125,123				

Table 281.—Capital Employed in the Talc and Soapstone Industry in Canada, 1928 and 1929

—	1928	1929
	$	$
CAPITAL EMPLOYED AS REPRESENTED BY—		
Cost of lands, buildings, machinery and tools	616,457	575,502
Cost of all supplies and stocks on hand	31,494	26,592
Cash, trading and operating accounts and bills receivable	84,657	52,541
Total	**732,608**	**654,635**

Table 282.—Employees, Salaries and Wages in the Talc and Soapstone Industry in Canada, 1928 and 1929

—	1928				1929			
	Number of employees		Total	Salaries and wages	Number of employees		Total	Salaries and wages
	Male	Female			Male	Female		
				$				$
Salaried employees	7	2	9	17,410	7	2	9	13,705
Wage-earners	82	.....	82	67,751	77	.....	77	60,595
Total	**89**	**2**	**91**	**85,161**	**84**	**2**	**86**	**74,300**

Table 283.—Wage-Earners in the Talc and Soapstone Industry in Canada, by Months, 1928 and 1929

Month	1928	1929	Month	1928	1929
January	78	80	July	82	76
February	75	77	August	81	70
March	75	75	September	82	75
April	78	74	October	86	75
May	80	77	November	77	76
June	75	78	December	75	68

Table 284.—*World Production of Talc and Soapstone, 1925-1929

(From the "Mineral Industry of British Empire"—"Imperial Institute")

(Long tons)

Country	1925	1926	1927	1928	1929
British Empire					
United Kingdom	.....	.....	.....	161	29
Union of South Africa	85	41	344	518	435
Canada (shipments)	12,923	14,078	14,751	13,326	13,847
India	8,525	9,674	5,053	5,539	7,217
Australia	1,052	911	1,069	1,327	569
Total	22,585	24,704	21,217	20,871	22,097
Foreign Countries					
Austria (exports)	12,679	13,642	16,864	24,000	19,293
China	50	(a)	(a)	.....	.....
Finland	.....	.....	1,033	4,650	(a)
France	68,256	74,544	74,400	(a)	(a)
Germany (Bavaria)	3,405	3,772	6,280	7,748	(a)
Greece	92	149	210	30	(a)
Italy	33,089	42,355	32,400	32,469	34,000
Norway (exports)	8,889	7,488	7,487	7,698	8,200
Rumania	.....	480	860	2,130	1,060
Russia (years ended Sept. 30)	.....	2,948	2,085	2,717	(a)
Spain	898	3,800	2,777	3,278	(a)
Sweden	2,337	2,876	3,420	4,799	(a)
Morocco (French zone) (exports)	.....	.....	2	527	600
United States	(b) 162,727	(b) 162,114	171,711	181,229	198,071
Uruguay (exports)	899	883	1,085	1,727	928
Japan	43,385	(a)	59,000	(a)	(a)
Total	336,706	315,051	379,614	273,002	262,152
Grand total	**359,291**	**339,755**	**400,831**	**293,873**	**284,249**

(a) Data not available. (b) Talc only.

MISCELLANEOUS NON-METAL MINING INDUSTRIES

Included under this heading are the following non-metallic minerals:

Actinolite	Manganese, bog
Barytes	Mineral waters
Beryl	Natro-alunite
Bituminous sands	Phosphate
Fluorspar	Pyrites
Lithium minerals	Silica brick
Magnesite	Sodium carbonate
Magnesium sulphate	Sodium sulphate

Statistics relating to capital, labour, fuel and power are combined for these industries and are shown in Tables 285 to 287.

In addition to the foregoing, data are also shown for production, imports and exports of sulphuric acid.

Table 285.—Capital Employed in the Miscellaneous Non-Metal Mining Industries in Canada, 1928 and 1929

—	1928	1929
	$	$
Capital Employed as Represented by—		
Cost of lands, buildings, machinery and tools	3,954,644	3,516,650
Cost of supplies and stocks on hand	367,064	333,404
Cash, trading and operating accounts and bills receivable	156,773	192,524
Total	**4,478,481**	**4,042,638**

Table 286.—Employees, Salaries and Wages in the Miscellaneous Non-Metal Mining Industries, 1928 and 1929

—	1928				1929			
	Number of employees			Salaries and wages	Number of employees			Salaries and wages
	Male	Female	Total		Male	Female	Total	
				$				$
Salaried employees	36	5	41	73,118	46	4	50	80,716
Wage-earners	353	.....	353	341,532	456	.....	456	464,500
Total	**389**	**5**	**394**	**414,650**	**502**	**4**	**506**	**545,216**

Table 287.—Wage-Earners in the Miscellaneous Non-Metal Mining Industries, by Months, 1928 and 1929

Month	Number		Month	Number	
	1928	1929		1928	1929
January	205	199	July	284	452
February	206	194	August	288	456
March	219	189	September	327	465
April	201	290	October	329	470
May	320	400	November	289	336
June	319	406	December	228	281

ACTINOLITE

Actinolite, which is a calcium-magnesium-iron silicate, is used in the manufacture of coal-tar roofing compounds. Mining of this mineral in Canada commenced in 1883. Canadian deposits from which production has been derived are located in Elzevir and Kaladar townships, Hastings county; Actinolite is the centre of this industry. In 1902 and 1903 production was at its peak and 550 tons were shipped; however, during the following six years, no operations were carried on. Shipments recommenced in 1910 and have continued up to the present. Annual production of ground actinolite during the past 9 years has ranged between 30 tons and 100 tons. In 1929, shipments to the United States from Canadian deposits amounted to 30 tons valued at $375.

Table 288.—Production of Actinolite in Canada, 1920-1929

(For production from 1897 to 1919 see Mineral Production of Canada 1928)

Year	Tons	Value	Year	Tons	Value
		$			$
1920	100	1,160	1925	40	500
1921	78	975	1926	80	1,000
1922	50	575	1927	86	1,075
1923	53	583	1928	70	875
1924	90	1,225	1929	30	375

BARYTES

Deposits of barytes at Five Islands, Colchester county, and Brookfield, Hants county, Nova Scotia were first operated between 1865 and 1870. These deposits have produced about 5,000 tons of barytes. The McKellar Island deposit in Thunder Bay district, Ontario, in the course of its operations produced several thousand tons of ore. Work ceased on this property in 1894.

Large deposits of barytes at Lake Ainslie, Cape Breton Island, were opened up in 1894 and operations in this district have been practically continuous since that date. Between 1900 and 1903 the Cap Rouge deposit in North Cheticamp district was operated.

During 1918 a deposit in Langmuir township, Ontario, was operated and a mill for grinding and preparing barytes was completed shortly before the close of navigation. A shipment of 60 tons was made. Development work was done on the Bellew mine in North Burgess township in 1918. A deposit near Tionaga station was operated in 1923 and 200 tons of barytes were shipped.

There is a growing demand for barium products particularly in the pigment industries Production of metallic barium began commercially in the United States during 1929; it is being used in a high-nickel alloy.

The 1929 Canadian barytes production was obtained from the Johnson mine at Lake Ainslie, Inverness county, Nova Scotia.

Table 289.—Production of Barytes in Canada, 1920-1929

(For the years 1885 to 1919 see Mineral Production of Canada 1928)

Year	Tons	Value	Year	Tons	Value
		$			$
1920	751	22,983	1925	95	2,259
1921	270	9,567	1926	100	2,307
1922	289	9,537	1927	56	1,268
1923	409	8,548	1928	127	2,847
1924	151	3,308	1929	105	2,341

Table 290.—Production in Canada and Imports of Barytes, 1927-1929

—	1927		1928		1929	
	Tons	Value	Tons	Value	Tons	Value
		$		$		$
Production	56	1,268	127	2,847	105	2,341
Imports—						
Barium proxide	35	3,195	7	1,304	14	2,216
Blanc fixé	511	28,053	622	35,470	946	52,473
Barytes	2,841	58,504	2,878	58,710	2,646	52,078
Lithopone	7,902	644,175	8,144	717,207	9,704	852,079
Satin white	1,044	29,528	1,413	46,703	1,252	38,315

BITUMINOUS SANDS

Bituminous sands are found in the Fort McMurray district, Alberta. This deposit is the largest occurrence of solid asphaltic material known. Considerable research work has been done in connection with these sands by the *Scientific and Industrial Research Council of Alberta* and the *Dominion Department of Mines*. Shipments of bituminous sands up to 1924 amounted to 531 tons. In 1925, the production was 1,148 tons at $4,594; in 1926, shipments totalled 528 tons at $2,112; and in 1927, the total was 2,706 tons valued at $10,824. During these three years, the McMurray Asphaltum and Oil Company and the Federal Department of Mines were the only producers. During 1929, shipments amounting to 989 tons valued at $3,956 were made.

Table 311.—Production of Bituminous Sands in Canada and Imports of Asphalt, 1927-1928

—	1927		1928		1929	
	Tons	Value	Tons	Value	Tons	Value
		$		$		$
Production—						
Bituminous sands	2,706	10,824	94	374	989	3,956
Imports—						
Asphalt, solid	47,737	856,225	47,991	822,425	53,760	829,328
Asphalt, not solid	.....	38,566	.....	46,890	.....	99,704
Asphalt in oil for paving purposes	.....	70,986	.....	95,562	.....	23,448
Total	.....	**965,777**	.....	**964,877**	.....	**952,480**

FLUORSPAR

The first recorded shipment of fluorspar from a Canadian deposit was made in 1905, when 12 tons were shipped from a mine in Madoc township, Ontario. Five years later about 200 tons were mined in Huntingdon township of which quantity 2 tons were shipped. In 1911, the metallurgical works at Deloro and the steel foundries at Welland received small shipments. The next year a further small production was recorded, however in the following three years no shipments were made. During 1916, Ontario companies shipped 1,284 tons and increasing tonnages were produced during 1917 and 1918. In the latter year British Columbia became a factor in this industry as the Rock Candy mine near Grand Forks commenced operations.

The largest production from Canadian deposits took place in 1920 when 11,235 tons were shipped. Four mines were operated in that year employing 119 men whose wages totalled $123,050.

Production of fluorspar in Canada during 1929 totalled 17,870 tons worth $268,120. This year's production was obtained principally from the Consolidated Mining and Smelting Company's Rock Candy mine in British Columbia.

Table 292.—Production of Fluorspar in Canada, by Provinces, 1920-1929

(For the years 1905 to 1919 see Mineral Production of Canada 1928)

—	Ontario		British Columbia		Canada	
	Tons	Value	Tons	Value	Tons	Value
		$		$		$
1920	3,758	68,475	7,477	171,971	11,235	240,446
1921	116	1,744	5,403	134,523	5,519	136,267
1922	284	3,905	4,219	98,233	4,503	102,138
1923	64	597	75	1,135	139	1,732
1924	76	1,343	.....	.....	76	1,343
1925	12	200	3,874	19,034	3,886	19,234
1926-1928	.....	.....	.....	.....	.....	.....
1929	70	1,120	17,800	267,000	17,870	268,120

Table 293.—Production in Canada and Imports of Fluorspar, 1927-1929

—	1927		1928		1929	
	Tons.	Value	Tons	Value	Tons	Value
		$		$		$
Production	.....	.....	.....	.....	17,870	268,120
Imports—						
Hydrofluosilicic acid	5	811	6	1,646	36	4,706
Fluorspar	4,561	58,707	14,362	153,046	12,092	159,798

LITHIUM MINERALS

Canada

In a statement prepared by J. F. Wright, *Federal Department of Mines*, Ottawa, Canada, on the subject of lithium minerals, there are the following remarks:—

An outcrop of massive lepidolite was discovered in July, 1924, about one mile south of the Winnipeg river, some 10 miles east and a little north of Pointe du Bois. The Manitoba lithium deposits are the only ones of possible commercial value known within the British Empire.

At the Silver Leaf Mining Syndicate deposit, the lithium minerals occur in pockets and lenses in the central portion of a body of pegmatite which is exposed for 125 feet in a general east-west direction and across an average width of 80 feet. An analysis of a hand-picked sample, judged to represent approximately the lithium-bearing rock after the gangue has been removed, gave 4·76 per cent lithia (Li_2O). There is estimated to be between 2,500 and 3,000 tons of this type of ore for each 10 feet in depth within a horizontal area equal to that at the surface. Two lens-shaped bodies of lepidolite, or a lithia mica of like character, estimated to contain about 540 tons of lithia ore for each 10 feet in depth and averaging 3·87 per cent lithia, occur near the south side of the pegmatite mass. This lithia mica contains only one-tenth of one per cent iron (Fe_2O_3), and therefore probably will be found satisfactory for the manufacture of opal, white and flint glass."

Active development commenced in 1925, camps being put up, and a compressor, drills, and gasoline engines installed. Three miles of pole tram-line and winter road were built to a point on the Winnipeg river a short distance below Lamprey Falls. A considerable tonnage of ore has been blasted out and some small shipments made to England, Germany and the United States. Transportation is not difficult as barges may be floated down the river to the railhead, Pointe du Bois.

MAGNESITE

Magnesite was discovered in Grenville township in 1900 but it was not until 1907 that work on a small scale was started on the deposits. The following year 120 tons were shipped for the manufacture of carbonic acid gas for the aerated waters industry and for use in making flooring cement.

The cutting off of the Austrian supply of magnesite to North America in 1914 brought attention to the Grenville deposits as a substitute in the manufacture of refractory brick and lining for metallurgical furnaces.

Operations in 1915 accounted for the employment of 110 men whose wages amounted to $23,607 and the year's production was 14,779 tons. The next year 183 men were employed earning $144,987 and producing 55,413 tons. From the point of tonnage produced 1917 was the record year for the magnesite industry in Canada as 58,090 tons were shipped with an average value of $12.54 per ton; 296 men were on the payrolls with wages totalling $194,864. Advances in prices took place in 1918 and consequently, although the production of 39,365 tons was 32·5 per cent less than the previous year, the value of $1,016,765 was a record one for the industry. In 1918 employment was furnished 305 men who received $326,417.

The hydromagnesite deposits near Atlin, British Columbia, were operated during 1915 and 1916; shipments recorded for the latter year amounted to 635 tons and were made to the eastern United States and to Great Britain. During 1921 a further shipment of 803 tons was made from these deposits. However, there has been no production since that date.

The Canadian production fell off sharply in 1921 to 3,730 tons but recovered somewhat in 1923 to 4,801 tons. In 1925 shipments totalled 5,576 tons valued at $122,325; during 1927 a total of 7,337 tons were shipped with a valuation of $230,309. An appreciable increase was recorded in the shipments of magnesite in 1928, when 13,195 tons worth $346,990 were produced.

All the magnesite mined during 1928 was produced in the province of Quebec and was sold in two forms, namely, dead-burned and calcined. Dead-burned magnesite is used entirely in the metallurgical industry as a refractory lining for furnaces. Calcined magnesite is used as a plastic material for floors and walls in buildings and also in the manufacture of pipe and furnace coverings, as it has strong insulating properties. Considerable quantities of the metal magnesium are being utilized in the construction of motor car and aeroplane engines.

Shipments of dead-burned and calcined magnesite from Canadian deposits during 1929 reached a total of 18,809 tons valued at $491,170, as compared with 13,195 tons at $346,990 shipped in 1928. Exports of magnesite were recorded at 5,279 tons, a considerable increase over the 1928 total of 1,827 tons. These exportations were principally to the United Kingdom.

Table 294.—Production of Magnesite in Canada, 1920-1929

(For the years 1908 to 1919 see Mineral Production of Canada 1928)

Year	Tons	Value	Year	Tons	Value
		$			$
1920	18,378	512,756	1925	5,576	122,325
1921	3,730	81,320	1926	4,571	137,431
1922	2,849	76,294	1927	7,337	230,309
1923	4,801	134,382	1928	13,195	346,990
1924	3,873	101,356	1929	18,809	491,170

Table 295.—Production in Canada, Imports and Exports of Magnesite, 1927-1929

—	1927		1928		1929	
	Tons	Value	Tons	Value	Tons	Value
		$		$		$
Crude, mined	20,418	.....	36,719	.....	43,229	.....
Crude, calcined	18,593	.....	31,488	.....	39,514	.....
PRODUCTION—Calcined and dead-burned	7,337	230,309	13,195	346,990	18,809	491,170
IMPORTS—						
Magnesia pipe covering	.....	157,982	.....	187,381	.....	259,080
Magnesite	166	5,805	220	9,543	125	4,423
Magnesite firebrick	.....	118,457	.....	140,944	.....	256,635
EXPORTS—						
Magnesite, calcined or dead-burned	1,953	47,487	1,837	44,101	5,279	125,613

Table 296.—World Production of Magnesite, 1925-1929

(From the "Mineral Industry of the British Empire"—"Imperial Institute")

(Long tons)

Producing country and description	1925	1926	1927	1928	1929
BRITISH EMPIRE					
Union of South Africa—					
Crude magnesite	1,795	1,854	1,810	1,457	1,682
Canada—					
Crude magnesite (mined)	3,767	11,248	18,231	32,785	38,597
Caustic magnesia } Dead-burnt magnesia	4,979	4,081	6,551	11,781	16,697
India—					
Crude magnesite	29,620	30,461	19,638	24,406	23,497
Australia—					
Crude magnesite	14,721	10,583	10,419	10,786	8,980
FOREIGN COUNTRIES					
Crude magnesite	336	233,000	350,000	305,000	430,000
Caustic magnesia (b)	10,425	9,000	20,000	37,000	(a)
Dead-burnt magnesia (b)	76,788	94,000	123,000	69,000	88,400
Bricks	.....	(a)	45,000	41,000	45,000
Czechoslovakia—					
Crude magnesite (b)	7,098	12,374	11,550	8,278	10,027
Calcined magnesite (b)	29,207	33,070	34,132	37,018	42,616
Greece—					
Crude magnesite	89,394	94,128	83,150	102,772	(a)
Caustic magnesia	28,829	26,368	27,000	25,787	(a)
Dead-burnt magnesia	.....	1,194	1,343	128	(a)
Italy—					
Crude magnesite	14,907	19,529	16,047	11,505	(a)
Jugoslavia (Serbia only)—					
Crude magnesite	.....	(a)	1,653	6,168	5,777
Norway—					
Crude magnesite	1,672	704	1,073	917	1,012
Calcined magnesite (exports)	445	198	262	314	503
Magnesia bricks (exports)	405	304	269	387	362
Russia—					
Crude magnesite	74,642	101,390	104,900	118,000	130,614
Caustic magnesia	2,190	2,046	2,933	(a)	(a)
Dead-burnt magnesia	19,691	27,252	28,924	(a)	(a)
Magnesia bricks	10,535	11,865	13,900	(a)	(a)
United States—					
Crude magnesite	107,732	119,200	108,473	113,571	167,554
Caustic (sales)	.....	16,589	12,402	11,884	10,170
Dead-burned (sales)	.....	37,982	35,902	40,384	70,268
Turkey—					
Crude magnesite	.....	.....	.....	.....	281

(a) Data not available.
(b) Exports less imports.

MAGNESIUM SULPHATE

In 1915 work commenced on the Spotted Lake deposit of magnesium sulphate, near Kruger mountain, Osoyoos division, British Columbia. Shipments were made of this material to the drug trade during 1915 and 1916. Crude magnesium sulphate to a total of 2,600 tons was extracted in 1917 of which quantity 929 tons were shipped to Oroville, Washington. The following year a deposit near Clinton, Lillooet district, was also operated. Preliminary shipments were made in 1920 from several lakes, containing these salts, on the Basque ranch, near Ashcroft, British Columbia.

No activities have been reported in this industry since 1923. In that year 121 tons of refined magnesium sulphate were shipped from a deposit near Ashcroft, British Columbia. Imports of magnesium sulphate or epsom salts during 1929 reached a total of 2,565 tons valued at $53,481; in the previous year 2,508 tons worth $47,717 were brought into Canada.

Table 297.—Production of Magnesium Sulphate in Canada, 1917-1929

Year	Tons	Value
		$
1917	929	4,645
1918	1,949	14,565
1919	738	9,115
1920	1,947	39,886
1921	2,029	39,506
1922	1,021	24,017
1923	121	6,580
1924-1929	.....	.....
Total	**8,734**	**138,314**

MANGANESE BOG

A deposit of bog manganese at Dawson Settlement, near Hillsborough, New Brunswick, was operated during 1929. The shipments from this property were consigned to the province of Quebec for use as a colouring agent in the brick trade.

MINERAL WATERS

A record of all the natural mineral waters produced in Canada and sold to the general public for medicinal purposes since 1888 has been compiled. In that year 124,850 gallons were produced and during the following ten years production varied between 424,600 gallons and 767,460 gallons. However, from 1899 to 1920 only the value of the shipments has been recorded; the high mark for the industry was reached in 1911 when the production was valued at $223,758. Since 1920 shipments have fallen off to a marked degree; in 1922, production was 221,433 gallons worth $14,220.

Production of mineral waters in Canada during 1929 amounted to 321,905 gallons valued at $16,139, made up of 12,205 gallons from Quebec and 309,700 gallons from Ontario springs.

Table 298.—Production of Mineral Waters in Canada, 1920-1929

(For the years 1888 to 1919 see the Mineral Production of Canada, 1928)

Year	Imp. gal.	Value	Year	Imp. gal.	Value
		$			$
1920	.....	24,582	1925	190,134	28,413
1921	328,273	21,716	1926	215,356	29,721
1922	221,433	14,220	1927	303,530	14,624
1923	232,451	16,455	1928	269,045	33,498
1924	209,353	15,421	1929	321,905	16,139

Table 299.—Production in Canada, Imports and Exports of Mineral Waters, 1927-1929

—	1927		1928		1929	
	Imp. gal.	Value	Imp. gal.	Value	Imp. gal.	Value
		$		$		$
PRODUCTION, by provinces—						
Quebec	10,330	1,813	15,415	5,608	12,205	2,488
Ontario	293,200	12,811	253,630	27,890	309,700	13,651
Total	**303,530**	**14,624**	**269,045**	**33,498**	**321,905**	**16,139**
IMPORTS—Mineral and aerated waters	.....	216,793	.....	209,714	.....	253,940
EXPORTS—Mineral and aerated waters	.....	16,780	.....	31,621	.....	12,320

NATRO-ALUNITE

Production of natro-alunite from a deposit at Kyuquot Sound, Vancouver Island, British Columbia, amounted to 30 tons in 1921. Small shipments were made during 1922, 1923 and 1925, but in 1926 there was no production. During 1927, a shipment of 7 tons of natro-alunite valued at $248 was made, but since that year no shipments were reported. The preparation of natro-alunite for the market consists in crushing, grinding and roasting; the resultant product, calcined alunite, may be used as a fertilizer because of the potash content.

Table 300.—Production of Natro-Alunite in Canada, 1921-1929

Year	Tons	Value
		$
1921	30	1,500
1922	50	2,500
1923	15	750
1924	.....	.....
1925	20	1,000
1926	.....	.....
1927	7	248
1928	.....	.....
1929	.....	.....
Total	**122**	**5,998**

PHOSPHATE

The existence of the extensive Lievre river deposits of crystalline phosphate lime or apatite was first noted in 1829. However, the first commercial shipments of this mineral in Canada were made between 1870 and 1877 from North Burgess township, Ontario to a superphosphate plant at Brockville. An active market was open in Europe for raw phosphate for fertilizer purposes and this added impetus to the mining of phosphate in Ontario and Quebec. From 1878 to 1892 inclusive, the industry in Canada was at its highest point, and 296,695 tons were produced. Exports during this 15-year period totalled 281,329 tons of which quantity Great Britain received approximately 86 per cent; the United States, 8 per cent; Germany, 5 per cent; and France, Denmark, Spain and Holland, the remainder. The maximum shipment of 31,753 tons was made in 1890. Since 1899, however, the annual production has exceeded the 1,500 ton mark only once.

The discovery and opening up in the United States of the large phosphate deposits in Florida in the nineties and later of those in Tennessee caused a sharp falling-off in prices for phosphate and resulted in the closing of the large Canadian mines.

The production of Canadian phosphate since 1895 has been mainly obtained as a by-product in the mining of mica.

Activity in the phosphate industry in Canada has been practically negligible for a number of years. In 1927 shipments of phosphate rock amounting to 151 tons valued at $1,717 were made.

Construction was commenced in 1929 by the Consolidated Mining and Smelting Company on a large fertilizer plant at Trail, B.C. These works, when in operation, will consume considerable quantities of phosphate rock.

Shipments of phosphate from Canadian deposits amounted to $1,185 tons valued at $5,380; in 1928 the production was 641 tons worth $8,276. The 1929 production was made up of 40 tons from Templeton township, Quebec, and 1,145 tons from a deposit near Fernie, B.C. Imports of phosphate into Canada during the year came entirely from the United States and totalled 18,192 tons valued at $114,741.

Table 301.—Production of Phosphate in Canada, by Provinces, 1920-1929

(For the years 1870 to 1919 see Mineral Production of Canada 1928)

Year	Quebec		Ontario		Canada	
	Tons	Value	Tons	Value	Tons	Value
		$		$		$
1920	.....	.....	.....	.....	.....	.....
1921	30	450	.....	.....	30	450
1922	131	1,320	59	476	190	1,796
1923	30	600	.....	.....	30	600
1924	.....	.....	.....	.....	.....	.....
1925	16	189	.....	.....	16	189
1926	40	800	.....	.....	40	800
1927	31	399	82	824	(a) 151	1,717
1928	91	1,126	.....	.....	(b) 641	8,276
1929	40	800	.....	.....	(c) 1,185	5,380

†No record of production.
(a) Includes 38 tons valued at $494 shipped from British Columbia deposits.
(b) Includes 550 tons valued at $7,150 shipped from British Columbia deposits.
(c) Includes 1,145 tons valued at $4,580 shipped from British Columbia deposits.

Table 302.—Production in Canada, Imports and Exports of Phosphate, 1927-1929.

—	1927		1928		1929	
	Tons	Value	Tons	Value	Tons	Value
		$		$		$
PRODUCTION	151	1,717	641	8,276	1,185	5,380
IMPORTS—						
Phosphate rock	17,485	94,758	10,388	68,266	18,192	114,741
Acid phosphate (not medicinal)	1,557	228,433	1,632	245,518	1,491	223,157
Phosphorus	44	34,618	21	14,795	39	29,777
Superphosphate or acid phosphate of lime	86,589	979,261	97,489	1,188,537	97,925	1,147,839
EXPORTS—Phosphate rock	.....	33	.....	44	52	1,408

PYRITES

Census returns for 1871 record a production of 2,800 tons of pyrites in Canada, made up of 2,300 tons from Quebec deposits and 500 tons from Ontario. However, it is only since 1886 that a continuous official record of pyrites production is available. Customs' records for the period 1881 to 1885 inclusive, show exports of 120,126 tons of pyrites to the United States. The 1886 output of pyrites was 42,906 tons, all of which was obtained from the Albert and Crown mines, Sherbrooke county, Quebec. In 1889, the production totalled 72,225 tons; shipments ranged from 27,687 tons to 158,566 tons during the following 24 years. The war years, 1914-1918, brought about an increased demand for sulphuric acid and a consequent advance in the production of pyrites. Shipments during this period reached a grand total of 1·6 million tons or approximately 46 per cent of the total Canadian production from 1886 to 1927.

It has been the practice of the Bureau in past years to report export shipments of pyrites in terms of the sulphur content of the pyrites. In view of the fact that there is now an important production of sulphur in the form of sulphuric acid made from waste bessemer gases, it has been decided to modify the method of reporting production so as to show the total sulphur content of pyrites shipped and of bessemer gases used in the manufacture of sulphuric acid.

The sulphur content of pyrites shipped and of waste bessemer gases used in the manufacture of sulphuric acid amounted to 42,781 tons valued at $350,843 as compared with 38,589 tons worth $321,033 produced in 1928. Pyrites shipments were made from Quebec, Ontario and British Columbia properties; sulphur was recovered from waste bessemer gases in Ontario and British Columbia. The total imports of sulphur and brimstone, crude or in roll or flour, during 1929 were recorded at 234,926 tons appraised at $3,789,243 and were obtained principally from the United States.

Table 303.—Production of Pyrites in Canada, 1920-1929

(For the years 1886 to 1919 see Mineral Production of Canada, 1928)

Year	Pyrites	Sulphur Content	Value	Year	Pyrites	Sulphur Content	Value
	tons	tons	$		tons	tons	$
1920	174,744	67,608	719,110	1925	15,005	7,587	58,899
1921	33,368	12,213	116,326	1926	17,845	8,975	63,899
1922	18,143	6,900	74,303	1927	50,863	25,229	198,388
1923	28,591	11,073	113,020	1928	68,836 †	38,589	321,033
1924	23,552	9,742	95,620	1929	.....	42,781	350,843

† Since 1928 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.

Table 304.—Production in Canada, Imports and Exports of Pyrites, 1927-1929

—	1927		1928			1929		
	Tons	Value	Tons		Value	Tons		Value
			Pyrites	Sulphur content		Pyrites	Sulphur content	
		$			$			$
PRODUCTION—								
Quebec	13,021	42,795	4,389	1,552	12,061	20,186	9,926	73,119
Ontario	463	6,077	464	*4,974	54,100	677	4,579	51,516
British Columbia	37,379	149,516	63,983	32,063	254,872	56,395	28,276	226,208
Total	**50,863**	**198,388**	**68,836**	**38,589**	***321,033**	**77,258**	**42,781**	**350,843**
IMPORTS—								
Brimstone or sulphur, crude or in roll or flour	177,686	2,918,047	182,343		2,962,935	234,926		3,789,243
EXPORTS—								
Sulphur contained in pyrites	13,611	105,981	31,596		249,705	31,987		246,771

* Since 1928 includes sulphur content of pyrites and estimated figures for quantity and value of sulphur in smelter gases used for acid making.

SULPHURIC ACID

Statistics collected from 7 establishments manufacturing sulphuric acid in Canada during 1929 gave the production of the commodity in terms of the standard grades of 50° Bé, 60° Bé and 66° Bé. For comparative purposes it has been deemed advisable to reduce the first two grades to their equivalent in 66° Bé acid. The production of 66° Bé sulphuric acid in Canada during 1929 totalled 110,749 tons vauled at $1,375,599. Five of the producing companies used 10,461 tons of pyrites and 25,978 tons of brimstone, while two concerns used waste smelter gases.

Table 305.—Production, Imports and Exports of Sulphuric Acid, 1927-1929

—	1927		1928		1929	
	Tons	Value	Tons	Value	Tons	Value
		$		$		$
PRODUCTION—						
Sulphur used	19,805	386,557	18,903	381,806	25,978	542,194
Pyrites used	19,379	100,374	18,494	88,889	10,461	53,008
Acid made*	98,470	1,172,507	96,227	1,077,836	110,749	1,375,599
IMPORTS of acid	53	8,548	55	8,652	111	10,287
EXPORTS of acid	17,407	191,926	13,329	152,544	8,397	91,634

* Expressed in terms of 66° Bé acid. Includes also the production of the Canadian Industries, Ltd., at Coniston, Ont., who now produce sulphuric acid from waste smelter gases.

SILICA BRICK

Silica brick is produced in Canada at Sydney, Nova Scotia, and Sault Ste. Marie, Ontario. The Nova Scotia raw material is obtained from a quarry located at Leitches Creek in Cape Breton county. In Ontario the quartz is extracted from a quarry in Deroche township, and is used in the production of refractory brick for the lining of steel furnaces.

The total production during 1929 amounted to 3,951 thousand valued at $173,581. The imports of silica brick during 1929 were valued at $330,592.

SODIUM CARBONATE

The commercial deposits of natural sodium carbonate now being worked in Canada occur on the line of the Pacific Great Eastern Railway in the Clinton mining district of British Columbia, in the vicinity of 70 Mile House. Small annual shipments have been recorded from the British Columbia deposits since 1921; the maximum production, 1,120 tons valued at $8,140, being shipped in 1925. During 1929 shipments amounted to 600 tons valued at $8,100 as compared with 519 tons worth $4,922 shipped in 1928.

Sodium carbonate is used largely in chemical and hydro-metallurgical plants. Its principal uses are, in the manufacture of glass, soap and paper; the bleaching and washing of linen, cotton, wool, etc., and the dyeing and printing of fabrics. Sodium carbonate has been utilized for some time as a means of removing, and of preventing the formation of boiler scale.

Soda ash from salt brine is made in Canada on a very large scale by Brunner-Mond Company Limited, at Amherstburg, Ontario.

Table 306.—Production of Sodium Carbonate in Canada, 1921-1929

Year	Tons	Value
		$
1921	197	14,773
1922	202	3,027
1923	265	3,975
1924	510	5,173
1925	1,120	8,140
1926	595	5,370
1927	805	9,995
1928	519	4,922
1929	600	8,100
Total	**4,813**	**63,477**

SODIUM SULPHATE

Sodium sulphate is produced in Canada from natural deposits in Saskatchewan. The material produced may be hydrated sodium sulphate, known as Glauber's salt, or anhydrous sodium sulphate known to the trade as salt cake. It occurs as hydrous crystals or in the form of saturated brines in numerous lakes throughout Western Canada. Shipments from this source commenced in 1920 and 811 tons were produced during that year. There has been an annual production from these deposits since that date.

Sodium sulphate is used extensively in the pulp and paper, nickel, glass, dye and textile industries and to a smaller extent for medicinal and tanning purposes.

Three companies operated deposits of natural sodium sulphate in Saskatchewan during 1929. Shipments from these deposits were recorded at 5,018 tons valued at $64,112 as compared with 6,016 tons at $68,804 shipped in 1928.

Table 307.—Production of Sodium Sulphate in Canada, 1920-1929

Year	Tons	Value	Year	Tons	Value
		$			$
1920	811	19,496	1926	6,775	13,550
1921	623	18,850	1927	5,659	11,319
1922	504	11,980	1928	6,016	68,804
1923	733	10,189	1929	5,018	64,112
1924	1,083	6,004			
1925	3,870	19,380	**Total**	**31,098**	**243,684**

Table 308.—Production in Canada and Imports of Sodium Sulphate, 1927-1929

—	1927		1928		1929	
	Tons	Value	Tons	Value	Tons	Value
		$		$		$
PRODUCTION—						
Natural Sodium Sulphate—						
Crude	5,659	11,319	6,016	68,804	5,018	64,112
Artificial Sodium Sulphate—						
Sodium sulphate	375	6,624	2,160	41,042	2,452	44,494
Glauber's salt	2,226	45,239	2,199	45,484	1,589	34,962
IMPORTS—						
Soda, bisulphate of, or nitre cake	13,143	50,698	36,561	311,606	80,872	1,081,984
Soda, sulphate of, crude, known as salt cake	42,333	686,458	38,835	445,244	39,512	514,212
Glauber's salt	288	5,276	356	5,386	362	4,450

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, Slate, and Stone.

Production in the clay products and the other structural materials industries in Canada has increased over four-fold in the past twenty-two years; from a valuation of $12,863,049 in 1907, the total for these industries rose to $58,534,834 in 1929. This advance has been spread over all the industries included under this group. Cement production in Canada in 1887 amounted to 69,843 barrels worth $81,909; in 1929 the total was 12,284,081 barrels valued at $19,337,235. The value of clay products produced increased from $1,126,057 in 1886 to $13,904,643 in 1929. Lime shipments in 1886 were valued at $283,755 or only 5 per cent of the 1929 value of $5,908,610. The stone industry has also shown substantial growth; data for 1886 place the value of stone production at $723,593, while the 1929 total was $12,066,532. Sand and gravel production records date back no further than 1912; shipments during that year were valued at $1,512,099 or only 20 per cent of the 1929 total of $7,317,814.

Contracts awarded for building and construction in Canada in 1912 as reported by the *MacLean Building Review* were valued at $463,083,000. In 1913 contract awards totalled $384,157,000, and in the following year a decrease to $244,952,000 was recorded. During the war period (1915-1918) construction work was largely neglected and the value of building awards remained below the 100-million-dollar mark during these years. A revival of building set in after the war, and in each year since 1920, the volume of building has been well above the 200-million-dollar mark. In 1929 the total value of building contracts awarded reached $576,652,000, establishing a new high record in the building industry of Canada.

Table 309.—Value of Clay Products and Other Structural Materials Produced in Canada, by Provinces, 1927-1929

Province	1927	1928	1929
	$	$	$
Nova Scotia	1,160,201	997,331	1,334,934
New Brunswick	475,365	400,140	585,696
Quebec	15,073,707	16,849,955	18,424,828
Ontario	19,662,038	20,438,279	25,001,461
Manitoba	2,373,075	3,166,797	4,291,397
Saskatchewan	574,301	809,371	1,190,168
Alberta	2,541,689	3,478,580	3,665,321
British Columbia	2,949,040	3,596,728	4,041,029
Canada	**44,809,419**	**49,737,181**	**58,534,834**

Table 310.—Production, Imports, Exports and Apparent Consumption of Clay Products and Other Structural Materials in Canada, 1927-1929

Item		Production	Imports	Exports	Apparent consumption
		$	$	$	$
Cement, portland	1927	14,391,937	105,490	308,144	14,189,213
	1928	16,739,163	177,758	340,624	16,576,297
	1929	19,337,235	254,111	252,955	19,338,391
Clay and clay products	1927	11,173,189	9,638,216	282,712	20,528,693
	1928	12,381,718	10,023,747	284,518	22,120,947
	1929	13,904,643	12,159,506	375,506	25,688,703
Lime	1927	3,923,388	70,075	367,939	3,625,524
	1928	4,534,568	61,811	357,085	4,242,294
	1929	5,908,610	49,395	428,209	5,529,796
Sand and gravel	1927	6,055,601	546,608	177,999	6,424,210
	1928	5,809,431	607,600	232,422	6,184,669
	1929	7,317,814	707,476	441,798	7,583,492
Slate	1927	.....	203,066	.....	203,066
	1928	.....	239,296	.....	239,296
	1929	.....	296,638	.....	296,638
Stone	1927	9,265,304	1,110,100	141,306	10,234,098
	1928	10,272,301	1,550,447	250,215	11,572,533
	1929	12,066,532	2,068,453	237,121	13,897,864
Total	**1927**	**44,809,419**	**11,676,485**	**1,278,100**	**55,207,804**
	1928	**49,737,181**	**12,663,719**	**1,464,864**	**60,936,036**
	1929	**58,534,834**	**15,535,639**	**1,735,589**	**72,334,884**

CEMENT

Although the first official record of the production of cement in Canada is that of the manufacture of hydraulic cement from the black limestones of Quebec in 1856, it is understood that lime and hydraulic cement were made at Hull between 1830 and 1840. The cement was manufactured from a grey argillaceous magnesian limestone obtained nearby. Plants were also operated at an early date at the mouth of the Magdalen river, Gaspé county, and in Argenteuil county, Quebec; in Ontario, at Kingston and Thorold.

It was not until 1887 that serious competition to the domestic production showed itself in large importations of Portland cement. In order to cope with this competition two Canadian manufacturers of natural cement changed their mills and processes. Canadian Portland cement made its appearance on the market in 1889. Two additional plants were constructed about this time; one at Shallow Lake, Ontario, and another at Longue Pointe, Quebec.

The period 1898 to 1905 was the scene of a boom in the construction and promotion of cement plants in Canada. Eleven marl plants were erected during these years, of which only three were really successful.

In Nova Scotia puzzolan cement was first produced from blast furnace slag and lime at Sydney in 1905. This plant was closed down in 1915, re-opened in 1920, but has been idle since 1921.

Hydraulic cement was made at the Wright plant in Hull, Quebec, between 1830 and 1840. This cement sold at prices ranging between $1.50 and $2.50 per barrel of 300 pounds. Only natural cement was produced at this plant until the invasion of the Canadian market by imported Portland cement necessitated the changing of the processes in order to retain the local business. In 1889, the first Portland cement produced by this concern was placed on the market. Operations were carried on until the destruction of the plant by fire in 1900.

During 1888, a small plant was erected at Pointe Claire, near Montreal; a small quantity of Portland cement was produced but the operations were not successful and were discontinued. A plant was constructed in 1889 at Longue Pointe on the bank of the St. Lawrence river, east of Montreal and early the following year shipments of Portland cement commenced. The first dry process rotary kiln used in Canada was installed at this plant in 1899. Eight years later, the Vulcan Company purchased this property and built a new mill with the most modern equipment. Operations at this plant also ceased in 1914.

The construction of the International plant at Hull was started in 1903 and within two years shipments were being made. This plant was enlarged in 1908 and the following year it became a unit in the large merger company. Owing to lack of market, because of the war, the plant was closed in 1914. Considerable work was done on the mill in 1925 and in June, 1926, operations recommenced. Cement is now being made by the wet process at this plant.

A new plant was started in 1907 on the north side of the St. Lawrence river near the eastern limit of Montreal. Within two years the company was absorbed in the consolidation of thirteen plants in Canada. Very extensive alterations and additions were made to this plant, and it has been in continuous operation since 1909.

In August, 1925, the Unic plant was opened up at St. Francois de Sales, about 20 miles northeast of Montreal; operations ceased here in 1926.

The National plant at Montreal East commenced shipments in 1926.

In Ontario cement was produced at Napanee Mills (now Strathcona) in 1867. Clinker was made in kilns at this place and hauled by wagons to Napanee for grinding and packing. A new plant was constructed at Napanee Mills in 1891 for the production of Portland cement from marl and clay. Marl was transported 25 miles by rail from Marlbank and clay was obtained locally. Operations at this Strathcona mill commenced in December, 1891. During the same year a small Portland cement plant was erected at Marlbank which obtained its raw materials from Lime Lake. The following year, the Marlbank plant was opened up and operated until 1898 when it was remodelled. In 1900 the Strathcona and Marlbank plants were taken over by a new company, and three years later the Marlbank mill was enlarged and improved, with the result that, in 1904, the Strathcona mill was closed permanently. Marlbank operations continued only until 1914 and since then the plant has been dismantled.

A company was incorporated in April, 1888, for the purpose of making Portland cement at Shallow lake, Ontario. At that time the rotary kiln was a new departure in the cement industry in England and one of these kilns was purchased and put into operation at the newly erected plant. After many vicissitudes, the company was re-organized in 1902; new equipment was obtained, and operations were made commercially successful. The plant was active until 1914 but it has since been dismantled.

The Hanover plant in Ontario was built in 1898 to use marl and clay as raw materials. Marl was used at this plant until 1920 when it was replaced by limestone shipped by rail from Walkerton. In September, 1925, the mill was closed.

The Lakefield plant, in Ontario, another marl and clay proposition, was erected in 1901, and operated until 1914. This plant has been rebuilt and is again in operation.

Another mill was commenced in 1907 at Point Anne, near Belleville; shipments were started in the following year. Since that time the plant has been enlarged and operations have been carried on continuously.

Construction of a new plant at Port Colborne, near the lake Erie entrance to the Welland canal was started in 1907 and shipping commenced during 1908. In 1909, it became a unit of the merger company and was enlarged considerably; operations have been maintained since that date.

A departure from the dry process employed in the rock plants was instituted in 1912 when the St. Mary's mill was brought into operation using the wet process. This concern has been active during the past 14 years and is still a large producer.

Records for 1869 show two cement plants in Ontario, with an investment in plant and machinery of $28,000, operating at Thorold and Napanee Mills and producing products valued at $3,825. The following year these two plants employed 26 men and produced $4,950 worth of products. In 1871 employment was furnished 28 men and the value of the mill output was $11,700. The growth of the industry through the natural cement stage to the final concentration of the producers on the manufacture of Portland cement may be traced by the inception and subsequent disappearance of many companies. An idea of the magnitude of the industry can be obtained by a glance at the data for 1913 after consulting the figures for the earlier years, and then comparing these with the statistics for 1925 and 1927. In 1913 the 14 Ontario plants

with a production of 3,992,998 barrels, employed 1,382 men earning $955,729, and in 1925 the 4 plants operating produced 3,462,358 barrels at $5,253,911, employed 749 men whose wages totalled $1,018,915. Incidentally the capital actually employed in 1925 was $12,513,281. During 1927 four plants were operated, their locations being Belleville, Port Colborne, Lakefield and St. Mary's. The production amounted to 3,751,786 barrels with a valuation of $5,144,326.

Cement production in Manitoba started with the manufacture of the natural product. The first plant was built at Arnold but the operations here ceased years ago. Babcock, a few miles from Arnold, was the site for another mill which was constructed in 1906. This plant is still active. The construction of a plant at Tuxedo (Fort Whyte) 9 miles southwest of Winnipeg was started in 1911. For two years this plant used clinker produced near Belleville, Ontario. Since 1913 this mill has been using limestone obtained from a quarry at Steep Rock on the east shore of Lake Manitoba, 145 miles north of Winnipeg. Cement is here made by the wet process.

Plants were erected at Calgary and Exshaw, Alberta, in 1906 and 1907. Raw materials for the former mill consisted of limestone hauled by rail from The Gap, some 60 miles west and shale from Sandstone, 20 miles south. The Exshaw mill, located 60 miles west of Calgary, uses limestone from a deposit close to the plant and shale which is transported by rail three miles from Kananaskis. In 1914 the Calgary mill was closed down and it has since been dismantled. A dry process plant was erected at Blairmore in 1909; it changed hands in 1919 but owing to insufficient demand for cement in the district, the plant has remained idle since that date.

A marl plant was built in 1912, at Marlboro about 140 miles west of Edmonton. Five years later a change was made to dry process, using limestone obtained from the mountains to the west, and local clay. Shipments have been made annually from this plant since 1917.

Work was commenced on a new plant at Medicine Hat in 1913 but the construction had not been completed before the outbreak of war in 1914 and the changed conditions caused the suspension of further work on this building.

The Canadian Pacific Railway Company was the first to attempt to manufacture cement in British Columbia. About the year 1891 this company started the replacement, on a large scale, of the original wooden structures on the mountain section of its line, using in this work large quantities of masonry. The cement required was very costly, as it was all brought from England in sailing vessels which had to make the long, slow trip around Cape Horn. In an effort to reduce this cost the company decided to investigate the possibility of making cement at or near Vancouver, and for this purpose brought out from the Isle of Wight an experienced cement maker and chemist, who, after examining various materials available, made a favourable report, and, in 1893, was commissioned to build a small plant on a site selected on the water front at Vancouver. Limestone was brought by barge from Texada island, about forty miles northwest of Vancouver, clay by rail from a cutting about thirty miles east, and coal by barge from the Dunsmuir mines on Vancouver island. The limestone was burned in simple kilns and then mixed with clay and water to form a slurry which was dried on a floor of iron plates with fires underneath. The dried slurry was burned in upright kilns and the clinker was ground by burr stones. The cement is said to have been of excellent quality and was used in thousands of yards of masonry which is still in good condition. This plant was in operation about ten years, after which it was dismantled.

In 1904, the Vancouver Portland Cement Company, Limited, built a rotary kiln plant at Tod Inlet on Vancouver island, and in 1912 the Associated Portland Cement Company (Canada), Limited, erected a similar plant at Bamberton, B.C. In 1916, these companies were united under the name of The British Columbia Cement Company, Limited.

In 1912, another plant was built near Princeton but the company operating it went into liquidation in 1914 and the plant has since been dismantled.

Canadian cement production set up a new high record in 1929. Shipments during 1929 totalled 12,284,081 barrels valued at $19,337,235 as compared with 11,023,928 barrels worth $16,739,163 produced in 1928.

Plants in Quebec, Ontario, Manitoba, Alberta and British Columbia were active during the year. Mills in Quebec produced 42·1 per cent of the total Canadian shipments; in Ontario, 37·7 per cent; in Manitoba, 8·1 per cent; in Alberta, 6·6 per cent, and in British Columbia, 5·5 per cent.

Imports of Portland cement into Canada during 1929 totalled 55,980 barrels averaging $3.38 per barrel; in 1928 the average value was $4.29 per barrel. Portland cement exports were recorded at 234,111 barrels valued at $252,955. The supply of cement made available for consumption in Canada in 1929 was the greatest on record and amounted to 12,105,950 barrels.
FOLIO 456

Table 311.—Production of Cement in Canada, 1920-1929

(For the years 1887 to 1919 see Mineral Production of Canada, 1928)

Year	Barrels	Value	Year	Barrels	Value
		$			$
1920	6,651,980	14,798,070	1925	8,116,597	14,046,704
1921	5,752,885	14,195,143	1926	8,707,021	13,013,283
1922	6,943,972	15,438,481	1927	10,065,865	14,391,937
1923	7,543,589	15,064,661	1928	11,023,928	16,739,163
1924	7,498,624	13,398,411	1929	12,284,081	19,337,235

Table 312.—Output, Sales, Imports, Exports and Consumption of Cement in Canada, 1926-1928

—	1927		1928		1929	
	Barrels	Value	Barrels	Value	Barrels	Value
		$		$		$
Output	9,927,163	.....	11,076,659	.....	12,252,203	.....
Sold or used	10,065,865	14,391,917	11,023,928	16,739,163	12,284,081	19,337,235
Stocks Dec. 31	1,470,611	.....	1,520,583	.....	1,488,751	.....
Imports—						
Portland cement	19,354	87,541	34,047	146,164	55,980	189,169
Manufactures	.....	17,879	.....	31,594	.....	64,942
Exports	249,694	308,144	267,325	340,624	234,111	252,955
Apparent Consumption	9,835,525	.....	10,790,650	.....	12,105,950	.....

Table 313.—Production of Cement in Canada, by Provinces, 1927-1929

Province	1927		1928		1929	
	Barrels	Value	Barrels	Value	Barrels	Value
		$		$		$
Quebec	4,636,751	5,383,058	4,913,820	6,305,396	5,169,408	7,120,374
Ontario	3,751,786	5,144,326	3,911,795	5,520,897	4,624,712	6,808,246
Manitoba	551,698	1,378,121	693,450	1,685,084	1,000,258	2,350,606
Alberta	601,699	1,303,880	834,067	1,732,582	808,796	1,770,786
British Columbia	523,931	1,182,552	670,796	1,495,204	680,907	1,487,223
Canada	**10,065,865**	**14,391,937**	**11,023,928**	**16,739,163**	**12,284,081**	**19,337,235**

Table 314.—Capital Employed in the Cement Industry in Canada, 1928 and 1929

—	1928	1929
	$	$
Capital employed as represented by—		
Cost of lands, buildings, machinery and tools	35,365,970	39,007,891
Cost of supplies and stocks on hand	4,020,658	3,968,456
Cash, trading and operating accounts and bills receivable	8,292,213	7,905,471
Total	**47,678,841**	**50,881,818**

Table 315.—Employees, Salaries and Wages in the Cement Industry in Canada, 1928 and 1929

Class	1928		1929	
	Number of employees	Salaries and wages	Number of employees	Salaries and wages
		$		$
Salaried employees	122	256,867	124	260,579
Wage-earners	2,285	3,148,518	2,422	3,263,016
Total	2,407	3,405,385	2,546	3,523,595

Table 316.—Wage-Earners in the Cement Industry in Canada, by Months, 1928 and 1929

Month	1928	1929	Month	1928	1929
January	1,867	2,190	July	2,433	2,619
February	1,941	2,087	August	2,423	2,613
March	2,030	2,220	September	2,383	2,447
April	2,158	2,239	October	2,311	2,435
May	2,412	2,432	November	2,356	2,428
June	2,468	2,555	December	2,263	2,250

CLAY AND CLAY PRODUCTS

Under "Clay and Clay Products" there have been included statistics relating to production in Canada from domestic clays, of (a) fireclay; (b) fireclay blocks and shapes; (c) firebrick; (d) brick made by the different processes, such as the soft mud process, stiff mud process and dry press; (e) structural tile, such as hollow blocks, roofing tile, floor tile (quarries), and ceramic or glazed floor and wall tile; (f) drain tile; (g) sewer pipe, including copings, flue linings, etc., and (h) pottery.

The clay products industry has been carried on in Canada for many years; census records for 1871 show 426 brick and tile producers in Canada, employing 3,073 workers whose wages totalled $399,698. The value of products made in that year was $925,235. Corresponding with the growth of the country, ten years later the number of plants in operation had risen to 560, with a payroll of 4,129 employees, wages amounting to $608,690 and a production value of $1,541,892. Statistics for 1886, record 261 brick and 82 tile plants in operation with a total output valued at $1,016,217. Building brick (common and pressed) was produced in increasing quantities from the beginning of the century; 1900 recorded a valuation of $2,275,000 while in 1906, the sum of $4,102,590 was realized from the sale of these products. Almost similar conditions applied to the activities of the plants producing other clay products.

In 1920, the 223 operators reported sales aggregating in value $10,664,929; wage-earners numbered 5,212, and the outlay for wages was $5,053,837. In 1929 the 186 operators produced clay products valued at $13,904,643, an increase of 13·6 per cent over the total for 1928. Ontario producers accounted for 49 per cent of the Canadian total and Quebec operators 23 per cent. In order of their relative clay products sales the other producing provinces were: Alberta, British Columbia, Nova Scotia, Saskatchewan, Manitoba and New Brunswick.

Canada's imports of clay and clay products during 1929 were valued at $12,159,566 made up of importations from the United States valued at $5,582,551; from the United Kingdom, $4,360,754; from Germany, $575,440; from France, $496,960; from Japan, $451,121; from Czechoslovakia, $431,223; minor quantities were also received from 20 other countries. Pottery and chinaware imports accounted for 45·14 per cent of the total clay and clay products importations, refractory brick, 21·09 per cent; clays, 6·43 per cent; sanitary ware, 5·25 per cent; porcelain, insulators, 4·57 per cent; and building brick and blocks, 4·22 per cent.

Exports from Canada of clays, building bricks, procelain insulators, earthenware and other clay manufactures were valued at $375,506. The United Kingdom received 34 per cent of these exportations.

Imports of clay and clay products into Canada in 1928 were valued at $10,023,747, including imports from Great Britain valued at $3,910,376; from the United States, $4,179,331; from Germany; $594,846; from France, $384,253; from Japan $381,860; from Czechoslovakia, $377,762; from Belgium, $116,041; minor amounts were also received from 21 other countries. Exports of clay and clay products from Canada during 1928 were valued at $284,518.

Brick.—Common and pressed brick produced in Canada during 1886 had a value of $873,600; the plants in operation were located in Prince Edward Island, Nova Scotia, New Brunswick, Quebec, Ontario, Manitoba, North West Territories and British Columbia. Progress in the brick industry was recorded during the succeeding twenty years and in 1906 the value of common and pressed brick produced reached a total of $4,102,590. In the following year, data were obtained segregating the production of these two classes of brick: 439,016,000 common brick valued at $3,455,524 and 78,922,000 pressed brick worth $794,722 were shipped during 1907.

Common brick production reached its highest point in 1912 when 769,192,000 at an average value of $9.11 per thousand, were shipped. During the same year pressed brick production established a record at 125,180,000 with an average value of $12.86 per thousand. Since 1917, the value per thousand has never fallen as low as the average price in 1912.

Paving brick production in Canada was first recorded in 1897 when 4,568,000 were shipped by plants at Toronto, Ontario. During the period 1899-1907, the average annual production was 3,917,000. Prior to 1914 the total Canadian output of paving brick came from West Toronto, Ontario, where shale from the banks of the Humber river was used. In 1914, 1915 and 1916 the Clayburn plant in British Columbia produced a small quantity. In 1916 a plant at Edmonton, Alberta, produced a small quantity of paving brick. During the succeeding five years there was no production, but in 1922, the Clayburn plant shipped 151,000. Production ceased until 1926, when the British Columbia plant made shipments of 122,000 paving brick. In the following year a small shipment was made from this plant. The 1929 shipments consisted of 97,000 from the Clayburn plant.

Stoneware and Pottery from Domestic Clays.—Records for 1888 show shipments of pottery from Canadian plants valued at $27,750; within the next four years the production had increased to nearly ten times that value. Production thereafter varied but remained above the $100,000 mark each year up to the end of 1911. From 1912 to 1916, values ranged between $35,371 and $64,900. During the following years a considerable improvement was shown in annual sales and in 1929 a valuation of $323,194 was recorded.

Four plants with total assets of $696,154 were engaged primarily in the production of stoneware and pottery from Canadian clays in 1929. Employees in the industry totalled 155 persons whose earnings were $177,620.

In New Brunswick, a plant at Saint John produces stoneware, Rockingham ware and flower pots from Canadian clay. Flower pots are produced from local clays at Toronto and Hamilton, Ontario. Rockingham ware and flower pots are produced at Medicine Hat, Alberta.

Fireclay.—Clays from the Drummond colliery at Westville, Nova Scotia, and from Flower Cove, New Brunswick, are used for the manufacture of refractory products.

In Quebec, the discoloured portions of the kaolin found at St. Remi d'Amherst can be utilized as a fireclay.

In the valleys of the Abitibi, Mattagami and Missinaibi rivers, which flow northward on the James bay slope, in Ontario, the occurrence of mesozoic deposits of refractory clays has been known for many years. The extension of the Temiskaming and Northern Ontario railway from Cochrane to Oil Can Portage on the Abitibi river has brought an important deposit within 12 miles of shipping facilities.

In Manitoba, semi-refractory shale is found in Turtle Mountain, at La Rivière and near Virden in the Assiniboine valley.

Refractory and simi-refractory clays occur in southern Saskatchewan. At Claybank, in the Dirt hills, south of Moose Jaw, standard firebrick, special shapes and face brick, are made from local clays. Similar clays are found near Michellton at Willows, south of Twelve Mile lake, and along the Frenchman river valley in the Cypress hills.

Along the Athabaska river near Fort McMurray, refractory and semi-refractory clays are found associated with the tar sands.

A very important deposit of fireclay occurs in Sumas mountain, about 40 miles eastward from Vancouver, British Columbia; at Clayburn refractory products are made from this clay. Refractory shales also occur near Whonnock and a residual fireclay deposit at Kyuquot, Vancouver Island, is operated; the clay is shipped to Victoria for the manufacture of stove linings and sewer pipe.

In 1889, the first production of fireclay in Canada was recorded, namely, 400 tons valued at $4,800. The maximum production for the industry, in point of tonnage, was reached in 1917 when 10,534 tons were shipped. During 1929, total shipments from Nova Scotia, New Brunswick, Saskatchewan, Alberta and British Columbia amounted to 5,041 tons valued at $35,226. Imports of fireclay into Canada in 1929 totalled 76,064 tons evaluated at $322,508.

Firebrick.—Firebrick production in Canada from domestic clays reached its highest point in 1917 when 8,192,000 were produced with an average selling value of $24.31 per thousand. Although sales have been smaller during the following years, higher prices prevailed and thus the 1917 aggregate valuation has been exceeded annually. During 1929 Nova Scotia, Saskatchewan, Alberta and British Columbia plants shipped 5,196,000 firebrick valued at $251,043.

Fireclay Blocks and Shapes.—Plants in Nova Scotia, New Brunswick, Saskatchewan, and British Columbia produce special fireclay blocks and shapes from domestic clays. In 1907 the output of this class of refractory products was valued at $18,000. Production increased until in 1918 a record for the industry was set up when shipments to a value of $111,589 were made. The 1929 production established a new high record sales value of $130,411.

Six plants in Canada, located at Montreal, St. Johns, Toronto and Hamilton produce special refractory blocks and shapes from imported clays.

Drain Tile.—Data regarding the production of drain tile in Canada are available since 1891. From information obtained by the *Ontario Department of Mines*, production during that year was valued at $90,000. Ten years later production had increased until a valuation of $250,000 was reached. During 1929 drain tile shipments totalled 25,000,000 valued at $720,316, a new high record for the industry in Canada.

Kaolin.—Deposits of kaolin at St. Remi d'Amherst were first noted by the Geological Survey in 1894. Two years later samples were shipped to porcelain plants at Trenton, New Jersey, but it was not until 1911 that any serious attempt was made to develop this property. Production commenced in 1912, when 20 tons were shipped. Increases were recorded annually until the maximum production of 1,750 tons for the industry was reached in 1916. Shipments continued up to 1923, in which year, 163 tons were sold. No commercial shipments of kaolin have been made from Canadian deposits since 1923. During 1927 and 1928 small shipments were made from the St. Remi d'Amherst deposit for testing purposes.

Some development work was done during 1925 and 1926 on the china clay deposits on the Mattagami river, near Long Falls, Temiskaming district, Ontario.

Other Clays.—A shipment of 30 tons of bentonite valued at $150 was made in 1926 from Princeton, British Columbia; in 1928, a further shipment of 20 tons was made. During 1926 development work was done near Williams lake, British Columbia, on a deposit of a refractory material known locally as kaolin but described merely as "silicate of alumina" by the Provincial Mineralogist; 129 tons value at $1,900 were produced. This material was shipped to Vancouver, British Columbia, where some was used in the manufacture of plastic firebrick and refractory cements, and some directly as fireclay. Some small shipments of white ball clay have been made to the United States from Saskatchewan deposits.

Sewer Pipe.—Records of sewer pipe production in Canada date back to 1888 when shipments of this commodity were valued at $266,320. Production being the succeeding years varied considerably until in 1907 a valuation of $667,100 was recorded. Seven years later, 1914, the sewer pipe production was valued at $1,104,499.

In 1929 a new high record for the industry was reached when sewer pipe, copings, and flue linings to a value of $2,005,887 were shipped from plants in Nova Scotia, Quebec, Ontario, Alberta and British Columbia. The total capital employed in this industry was $3,694,714 and employment was afforded 391 persons who received $495,666 in salaries and wages.

Structural Tile.—Records of the production of structural tile in Canada include such items as hollow blocks (fireproofing and load-bearing tile), roofing tile, and floor tile. Hollow blocks are produced in every province except Prince Edward Island. Roofing and floor tile are made in Ontario. The total production of structural tile in Canada during 1929 was valued at $2,289,198 as compared with a value of $1,982,316 in the previous year.

In this section all tables except Table 319 show data for domestic clay products only.

Table 317.—Production of Clay Products in Canada from Domestic Clays by Provinces, 1920–1929

(For the years 1886 to 1919 see Mineral Production of Canada, 1928)

Year	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Canada
	$	$	$	$	$	$	$	$	$	$
1920	.....	541,114	73,484	2,376,029	5,613,488	206,764	471,448	786,430	596,172	**10,664,929**
1921	.....	361,761	66,600	1,744,760	5,183,125	208,982	166,244	710,477	415,869	**8,857,818**
1922	3,975	427,643	75,425	2,494,236	6,944,218	210,740	134,764	700,063	447,452	**11,438,456**
1923	.....	413,974	62,587	2,439,598	6,270,615	160,134	119,405	590,595	426,138	**10,483,016**
1924	3,340	355,948	74,994	2,435,695	5,089,299	117,450	137,280	540,477	460,594	**9,215,077**
1925	3,020	422,690	69,473	2,426,887	5,195,084	173,794	95,952	618,860	523,931	**9,529,691**
1926	.....	362,667	75,851	2,702,298	5,356,469	248,497	214,113	804,933	592,405	**10,357,323**
1927	.....	416,417	87,185	2,734,738	5,853,035	201,464	311,301	889,358	679,788	**11,173,189**
1928	.....	496,577	72,192	3,097,295	6,177,661	294,791	377,896	1,162,264	706,039	**12,381,718**
1929	.....	653,157	160,006	3,187,702	6,830,162	362,240	502,522	1,342,427	866,427	**13,904,643**

Table 318.—Production of Clay Products in Canada, from Domestic Clays, by Provinces, 1927–1929

Province	1927		1928		1929	
	Sold or used	Per cent of total value	Sold or used	Per cent of total value	Sold or used	Per cent of total value
	$		$		$	
Nova Scotia	416,417	3·73	496,577	4·01	653,157	4·70
New Brunswick	87,185	0·78	72,192	0·58	160,006	1·15
Quebec	2,734,738	24·48	3,097,295	25·02	3,187,702	22·92
Ontario	5,853,035	52·38	6,177,661	49·89	6,830,162	49·12
Manitoba	201,464	1·80	294,791	2·38	362,240	2·61
Saskatchewan	311,301	2·79	377,896	3·05	502,522	3·61
Alberta	889,358	7·96	1,162,264	9·39	1,342,427	9·65
British Columbia	679,788	6·08	706,039	5·70	866,427	6·23
Canada	**11,173,189**	**100·00**	**12,381,718**	**100·00**	**13,904,643**	**100·00**

Table 319.—Value of Clay Products Produced in Canada from Domestic and from Imported Clays, 1928 and 1929

Product	From domestic clays		From imported clays		Total	
	1928	1929	1928	1929	1928	1929
	$	$	$	$	$	$
Fireclay blocks and shapes	105,091	130,411	313,637	362,360	418,728	492,771
Sanitary ware	.....	.....	520,871	*	520,871	.....
Ceramic or glazed floor and wall tile	.....	.....	133,411	*	133,411	.....
Pottery, glazed and unglazed	356,093	323,194	38,144	69,140	394,237	392,334
Electrical porcelain insulators	.....	.....	1,321,556	2,065,404	1,321,556	2,065,404
Other clay products (brick, tile, sewer pipe, etc.)	11,929,534	13,451,038	131,182	876,134	12,951,716	14,327,172
Total	**12,381,718**	**13,904,643**	**2,458,801**	**3,373,038**	**14,840,519**	**17,277,681**

* Included with other clay products

Table 320.—Production in Canada, Imports and Exports of Clay and Clay Products, 1927–1929

Kind		1927 Quantity	1927 Total selling value	1928 Quantity	1928 Total selling value	1929 Quantity	1929 Total selling value
			$		$		$
PRODUCTION—							
Brick: Soft mud process, Face	M	16,196	325,966	17,532	349,847	26,624	538,096
Soft mud process, Common	M	70,554	1,091,274	93,280	1,328,981	77,399	1,195,511
Stiff mud process (wire cut), Face	M	95,480	2,024,064	101,717	2,247,472	114,093	2,469,417
Stiff mud process (wire cut), Common	M	150,222	2,239,180	144,404	2,182,307	170,840	2,506,451
Dry press, Face	M	39,753	833,570	36,587	748,301	38,591	813,461
Dry press, Common	M	14,617	187,062	24,294	337,096	26,131	368,039
Fancy or ornamental brick (including special shapes, embossed and enamelled brick)	M	620	29,372	599	28,763	187	12,795
Sewer brick	M	10,997	210,643	2,888	59,010	4,765	96,588
Paving brick	M	50	2,106	338	4,464	97	3,844
Firebrick from domestic clay	M	5,388	246,266	4,940	234,460	5,196	251,043
Fireclay	tons	5,070	35,961	5,123	35,284	5,041	35,226
Kaolin		24	120	5	25	.....	.....
Bentonite	tons	.....	.....	20	100	.....	.....
Fireclay blocks and shapes		.....	100,659	.....	105,091	.....	130,411
Structural tile:—							
Hollow blocks (including fireproofing and load-bearing tile)	tons	151,307	1,431,141	205,257	1,930,152	221,800	2,214,384
Roofing tile	No.	2,000	140	72,930	6,435	35,075	4,628
Floor tile (quarries)	Sq. ft.	135,285	32,559	171,520	45,729	307,400	70,186
Drain tile	M	22,259	598,098	22,629	656,054	25,000	720,316
Sewer pipe (including copings, flue linings, etc.)	tons	77,262	1,475,875	.....	1,723,644	.....	2,005,887
Pottery, glazed or unglazed		.....	307,057	.....	356,093	.....	323,194
Other products		.....	2,076	.....	2,410	.....	142,166
Total		.....	**11,173,189**	.....	**12,381,718**	.....	**13,904,643**
IMPORTS—							
Bath brick		.....	.....	.....	.....	.....	.....
Building brick	M	6,672	142,438	14,513	246,723	15,678	291,370
Building blocks		.....	42,365	.....	58,016	.....	222,947
Clays—							
China	cwt.	420,822	235,824	462,357	262,207	497,571	292,980
Fire	cwt.	984,526	219,500	1,219,155	266,320	1,521,282	322,508
Pipe		.....	2,258	.....	794	.....	570
Zirconium silicate		.....	2,548	.....	2,450	.....	8,223
Zirconium oxide		.....	.....	.....	.....	.....	8,244
Other clays		.....	90,183	.....	93,663	.....	150,604
Drain tile, unglazed		.....	2,059	.....	556	.....	2,809
Drain sewer pipe and earthenware fittings therefor, chimney linings or vents chimney tops or inverted blocks, glazed or unglazed		.....	77,274	.....	103,506	.....	119,654
Insulators, electric, porcelain		.....	437,328	.....	510,008	.....	556,535
Earthenware and chinaware		.....	5,549,327	.....	5,418,017	.....	6,257,954
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.		.....	20,634	.....	38,327	.....	93,513
Brick, fire, n.o.p., for use exclusively in the construction or repair of a furnace, kiln or other equipment of a manufacturing establishment		.....	1,152,277	.....	1,217,003	.....	1,706,109
Firebrick, n.o.p.		.....	121,343	.....	117,539	.....	76,963
Firebrick, chrome		.....	52,565	.....	56,375	.....	101,302
Magnesite brick		.....	118,457	.....	140,944	.....	256,635
Silica brick		.....	329,214	.....	259,192	.....	330,592
Paving brick	M	2,051	54,561	3,431	88,943	5,173	120,871
Other clay manufactures		.....	988,061	.....	1,143,164	.....	1,239,183
Total		.....	**9,638,216**	.....	**10,023,747**	.....	**12,159,566**
EXPORTS—							
Building brick	M	1,450	23,059	3,034	46,037	1,587	21,797
Clay—							
Unmanufactured	cwt.	15,454	2,940	19,903	20,577	16,379	6,640
Manufactures		.....	86,746	.....	76,529	.....	54,397
Earthenware		.....	14,771	.....	17,235	.....	24,563
Porcelain insulators		.....	155,196	.....	124,140	.....	268,109
Total		.....	**282,712**	.....	**284,518**	.....	**375,506**

Table 321.—Production of Building Brick in Canada by Provinces, 1927-1929

—			Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia
1927										
Soft mud process.	Face	M	35	.....	83	16,078	.....	.....	.....	.....
		$	735	.....	1,243	323,988	.....	.....	.....	.....
	Common	M	972	2,885	6,167	44,882	1,132	863	2,305	11,348
		$	12,893	44,100	63,353	740,664	18,100	10,592	28,461	173,111
Stiff mud process (wire cut).	Face	M	1,345	.....	24,762	65,894	143	1,419	1,545	372
		$	31,068	.....	577,348	1,321,604	3,800	42,711	35,613	11,920
	Common	M	3,887	.....	106,341	21,177	7,391	5,709	5,619	98
		$	47,549	.....	1,627,330	310,344	122,019	66,654	62,892	2,392
Dry press	Face	M	.....	.....	2,134	32,699	947	576	2,448	949
		$	.....	.....	63,047	641,903	21,921	19,197	48,467	39,035
	Common	M	.....	.....	.....	1,147	.....	.....	13,470	.....
		$	.....	.....	.....	12,716	.....	.....	174,346	.....
Fancy or ornamental brick		M	.....	.....	101	519	.....	.....	.....	.....
		$	.....	.....	4,356	25,016	.....	.....	.....	.....
Sewer brick		M	.....	.....	.....	10,760	.....	.....	.....	237
		$	.....	.....	.....	202,920	.....	.....	.....	7,723
Total		**M**	**6,239**	**2,885**	**139,588**	**193,156**	**9,613**	**8,567**	**25,387**	**13,004**
		$	**92,245**	**44,100**	**2,336,677**	**3,579,155**	**165,840**	**139,154**	**349,779**	**231,181**
1928										
Soft mud process.	Face	M	185	50	70	16,327	.....	.....	662	238
		$	2,220	1,000	1,115	317,800	.....	.....	22,163	5,549
	Common	M	1,016	1,951	18,576	45,793	13,253	100	8,121	4,470
		$	13,262	30,678	169,307	727,323	209,575	1,700	106,610	70,526
Stiff mud process (wire cut).	Face	M	1,510	.....	29,914	64,664	2,014	1,374	845	1,396
		$	34,639	.....	686,752	1,367,859	42,350	44,208	17,927	53,737
	Common	M	6,137	.....	99,014	23,711	.....	9,981	3,479	2,082
		$	77,193	.....	1,542,576	383,687	.....	114,106	33,352	31,393
Dry press	Face	M	.....	.....	2,492	29,182	.....	432	4,481	.....
		$	.....	.....	66,842	581,609	.....	12,426	87,424	.....
	Common	M	.....	.....	52	3,460	328	.....	17,593	2,861
		$	.....	.....	511	43,753	4,945	.....	243,039	44,848
Fancy or ornamental brick		M	.....	.....	67	532	.....	.....	.....	.....
		$	.....	.....	3,049	25,714	.....	.....	.....	.....
Sewer brick		M	.....	.....	.....	2,621	.....	.....	.....	.....
		$	.....	.....	.....	49,547	.....	.....	.....	.....
Total		**M**	**8,848**	**2,001**	**150,185**	**186,290**	**15,595**	**11,887**	**35,181**	**11,047**
		$	**127,314**	**31,678**	**2,470,152**	**3,497,292**	**256,870**	**172,440**	**510,515**	**206,053**
1929										
Soft mud process.	Face	M	185	60	1,000	25,379	.....	.....	.....	.....
		$	2,405	1,500	12,000	522,191	.....	.....	.....	.....
	Common	M	757	3,471	7,468	38,655	14,409	473	3,390	9,376
		$	10,020	55,120	76,963	606,714	234,481	7,031	45,932	159,250
Stiff mud process. (wire cut)	Face	M	1,651	432	38,146	63,569	3,040	2,071	2,281	2,903
		$	44,651	10,808	771,573	1,333,723	70,940	62,790	67,166	107,763
	Common	M	12,818	2,124	99,818	31,525	.....	16,573	13,896	86
		$	160,906	31,860	1,529,751	505,958	.....	121,833	157,250	1,893
Dry press	Face	M	.....	.....	2,990	30,292	.....	1,184	4,125	.....
		$	.....	.....	81,333	611,625	.....	38,652	81,851	.....
	Common	M	.....	.....	.....	5,482	.....	.....	18,322	2,327
		$	.....	.....	.....	76,016	.....	.....	254,472	37,551
Fancy or ornamental brick		M	.....	.....	75	112	.....	.....	.....	.....
		$	.....	.....	3,783	9,012	.....	.....	.....	.....
Sewer brick		M	.....	.....	.....	4,631	.....	.....	.....	134
		$	.....	.....	.....	92,316	.....	.....	.....	4,272
Total		**M**	**15,411**	**6,087**	**149,497**	**199,045**	**17,449**	**14,301**	**42,014**	**14,826**
		$	**217,985**	**99,288**	**2,475,403**	**3,757,555**	**305,421**	**230,306**	**606,671**	**310,729**

Table 322.—Production of Building Brick (Common and Pressed) in Canada, 1886-1923

Year	Common and Pressed*		Year	Common		Pressed		Total	
	Quantity	Value		Quantity	Value	Quantity	Value	Quantity	Value
	M	$		M	$	M	$	M	$
1886	.....	873,600	1907	439,016	3,455,524	78,922	794,722	517,938	4,250,246
1887	.....	986,689	1908	353,261	2,611,554	53,481	517,180	406,742	3,128,734
1888	.....	1,036,746	1909	539,229	4,212,424	57,265	630,677	596,494	4,843,101
1889	.....	1,273,884	1910	627,715	5,105,354	67,895	807,294	695,610	5,912,648
1890	.....	1,266,982	1911	645,551	5,420,890	87,351	1,094,582	732,902	6,515,472
1891	.....	1,061,536	1912	769,192	7,010,375	125,180	1,609,854	894,372	8,620,229
1892	.....	1,251,934	1913	668,427	5,917,373	116,802	1,458,733	785,229	7,376,106
1893	.....	1,800,000	1914	457,514	3,653,861	93,635	1,115,556	551,149	4,769,417
1894	.....	1,800,000	1915	234,733	1,755,187	49,817	492,774	284,550	2,247,961
1895	.....	1,670,000	1916	237,035	1,826,844	44,947	492,355	281,982	2,319,199
1896	.....	1,600,000	1917	210,631	1,999,465	46,409	653,153	257,040	2,652,618
1897	.....	1,600,000	1918	164,970	1,879,811	40,147	639,083	205,117	2,518,894
1898	.....	1,900,000	1919	291,470	3,850,219	74,424	1,304,162	365,894	5,154,381
1899	.....	2,195,000	1920	303,343	4,835,996	85,137	2,004,537	388,480	6,840,533
1900	.....	2,275,000	1921	220,438	3,567,503	80,947	1,738,293	301,385	5,305,796
1901	.....	2,400,000	1922	294,919	4,714,658	90,578	1,839,549	385,497	6,554,207
1902	.....	2,593,000	1923	250,565	3,884,474	73,400	1,461,483	323,965	5,345,957
1903	.....	2,832,000							
1904	.....	2,983,000	**Total**	.....	.....	.....	.....	.....	125,791,385
1905	523,820	3,933,925							
1906	523,390	4,102,590							

* Separate statistics not available till 1907.

Table 323.—Production of Building Brick in Canada, 1924-1929

—		Soft mud process		Stiff mud process (wire cut)		Dry Press		Fancy or ornamental brick	Sewer brick	Total
		Face	Common	Face	Common	Face	Common			
1924	M	10,831	50,079	80,565	124,556	35,203	12,794	755	2,690	317,473
	$	185,248	746,044	1,842,224	1,880,631	761,572	168,043	98,460	40,775	5,722,997
1925	M	27,701	51,214	93,903	116,105	37,201	22,053	524	2,485	351,186
	$	521,739	753,970	1,883,856	1,635,257	890,504	270,135	26,320	52,382	5,944,163
1926	M	28,235	78,158	101,028	94,046	30,423	19,450	462	6,546	358,348
	$	556,573	1,145,490	2,146,362	1,624,055	651,236	260,598	24,057	117,194	6,525,365
1927	M	16,196	70,554	95,480	150,222	39,753	14,617	620	10,997	398,439
	$	325,966	1,091,274	2,024,064	2,239,180	833,570	187,062	29,372	210,643	6,941,131
1928	M	17,532	93,280	101,717	144,404	36,587	24,294	599	2,888	421,301
	$	349,847	1,328,981	2,247,472	2,182,307	748,301	337,096	28,763	59,010	7,281,777
1929	M	26,624	77,399	114,093	170,840	38,591	26,131	187	4,765	458,630
	$	538,096	1,195,511	2,469,417	2,509,451	813,461	368,039	12,795	96,588	8,003,358
Total	M	127,119	420,684	586,786	800,173	217,758	119,339	3,147	30,371	2,305,377
	$	2,477,469	6,261,270	12,613,395	12,070,881	4,608,641	1,590,973	219,767	576,592	40,418,991

Table 324.—Production of Paving Brick* in Canada, 1897-1929

Year	Quantity	Value	Year	Quantity	Value	Year	Quantity	Value
	M	$		M	$		M	$
1897	4,568	45,670	1906	3,000	45,000	1915	1,228	20,634
1898	.....	.....	1907	3,618	72,354	1916	1,590	30,141
1899	5,300	42,550	1908	3,720	59,456	1917-1921	.....	.....
1900	2,710	26,950	1909	3,760	67,408	1922	151	5,972
1901	3,689	37,000	1910	4,215	78,980	1923-1925	.....	.....
1902	4,211	42,000	1911	5,220	79,444	1926	122	5,015
1903	3,789	45,288	1912	4,580	85,989	1927	50	2,104
1904	4,436	55,450	1913	4,208	75,669	1928	338	4,464
1905	4,500	54,000	1914	2,707	49,627	1929	97	3,844
						Total	71,807	1,035,074

*Figures prior to 1907 compiled by the *Ontario Bureau of Mines.*

Table 325.—Production of Structural Tile in Canada, by Provinces, 1927-1929

Province	Hollow blocks (including fireproofing and load-bearing tile)		Roofing tile		Floor tile (quarries)	
	Tons	Value	No.	Value	Sq. ft.	Value
1927		$		$		$
Nova Scotia	8,793	96,260	...	...	...	...
Quebec	25,034	257,558	...	...	...	...
Ontario	86,690	775,806	2,000	140	134,910	32,490
Manitoba	1,552	18,862	...	...	...	...
Saskatchewan	6,500	65,000	...	...	...	...
Alberta	15,345	142,156	...	...	...	...
British Columbia	7,393	75,499	...	...	375	69
Canada	**151,307**	**1,431,141**	**2,000**	**140**	**135,285**	**32,559**
1928						
Nova Scotia	11,254	132,594	...	...	...	...
Quebec	40,607	441,107	...	...	500	50
Ontario	112,887	983,005	72,930	6,435	171,020	45,679
Manitoba	2,160	25,710	...	...	...	...
Saskatchewan	10,120	81,202	...	...	...	...
Alberta	18,432	166,142	...	...	...	...
British Columbia	9,857	100,392	...	...	...	...
Canada	**205,257**	**1,930,152**	**72,930**	**6,435**	**171,520**	**45,729**
1929						
Nova Scotia	15,455	182,076	...	...	...	...
New Brunswick	1,119	23,734	...	...	...	...
Quebec	49,488	536,684	...	...	...	...
Ontario	103,454	972,993	35,075	4,628	307,400	70,186
Manitoba	2,785	41,251	...	...	...	...
Saskatchewan	13,257	111,072	...	...	...	...
Alberta	20,812	195,503	...	...	...	...
British Columbia	15,430	151,068	...	...	...	...
Canada	**221,800**	**2,214,384**	**35,075**	**4,628**	**307,400**	**70,186**

Table 326.—Production of Sewer Pipe in Canada, 1920-1929

(For the years 1888 to 1919 see Mineral Production of Canada 1928)

Year	Tons	Value	Year	Tons	Value
		$			$
1920	58,887	1,549,090	1925	73,791	1,440,269
1921	...	1,666,584	1926	75,996	1,480,776
1922	75,932	1,766,347	1927	77,202	1,475,875
1923	70,252	1,616,324	1928	...	1,723,044
1924	76,355	1,594,280	1929	...	2,005,887

*Data not available.

Table 327.—Production of Drain Tile in Canada, 1920-1929

(For the years 1891 to 1919 see Mineral Production of Canada, 1928)

Year	Quantity	Value	Year	Quantity	Value
	M	$		M	$
1920	14,527	562,652	1925	14,552	401,503
1921	...	473,952	1926	14,258	396,018
1922	14,728	407,386	1927	22,259	598,098
1923	10,599	323,314	1928	22,629	656,054
1924	15,137	409,369	1929	25,000	720,316

Table 328.—Production of Drain Tile and Sewer Pipe, in Canada, by Provinces, 1928 and 1929

Province	1928				1929			
	Drain tile		Sewer pipe		Drain tile		Sewer pipe	
	M	$	Tons	$	M	$	Tons	$
Nova Scotia	89	3,282	.....	211,833	131	5,284	.....	225,128
Quebec	531	18,833	.....	163,521	807	28,500	.....	147,115
Ontario	20,276	572,577	.....	974,157	22,535	629,322	.....	1,167,463
Manitoba	149	9,211	.....	.....	392	15,565	.....	.....
Saskatchewan	15	600	.....	.....	25	1,000	.....	.....
Alberta	377	12,761	.....	247,410	158	7,711	.....	335,954
British Columbia	1,192	38,790	.....	126,723	952	32,934	.....	130,227
Canada	**22,629**	**656,054**	.....	**1,723,644**	**25,000**	**729,316**	.....	**2,005,887**

Table 329.—Production of Pottery from Domestic Clays in Canada, 1920-1929

(For the years 1888 to 1919 see Mineral Production of Canada, 1928)

Year	Value	Year	Value
	$		$
1920	209,171	1925	267,255
1921	234,263	1926	320,135
1922	266,391	1927	307,057
1923	229,547	1928	356,093
1924	238,342	1929	323,194

Table 330.—Production of Kaolin in Canada, 1912-1929

Year	Tons	Value	Year	Tons	Value	Year	Tons	Value
		$			$			$
1912	20	160	1918	863	19,299	1924-1926	.....	.....
1913	500	5,000	1919	759	13,744	1927	24	120
1914	1,000	10,000	1920	683	15,022	1928	5	25
1915	1,300	13,000	1921	124	1,888	1929	.....	.....
1916	1,750	17,500	1922	1,197	17,866			
1917	533	9,594	1923	163	2,369	**Total**	**8,921**	**125,587**

Table 331.—Production of Fireclay in Canada, 1920-1929

(For years 1899 to 1919 see Mineral Production of Canada, 1928)

Year	Quantity	Value	Year	Quantity	Value
	Tons	$		Tons	$
1920	8,321	44,091	1925	623	6,544
1921	2,931	29,851	1925	2,513	23,258
1922	10,196	55,185	1927	5,070	35,961
1923	2,685	24,158	1928	5,123	35,284
1924	3,645	26,258	1929	5,041	35,226

Table 332.—Production of Firebrick and Fireclay Blocks and Shapes in Canada, from Domestic Clays, 1920-1929

(For the years 1907 to 1919 see Mineral Production of Canada, 1928)

Year	Firebrick		Fireclay blocks and shapes	Year	Firebrick		Fireclay blocks and shapes
	Quantity	Value	Value		Quantity	Value	Value
	M	$	$		M	$	$
1920	7,293	375,230	54,792	1925	6,197	305,332	36,567
1921	4,502	242,492	91,685	1926	4,195	192,276	54,064
1922	6,705	251,776	65,588	1927	5,388	246,266	100,659
1923	6,122	295,037	81,345	1928	4,910	234,460	105,091
1924	4,327	209,256	51,273	1929	5,196	251,043	130,411

Table 333.—Production of Refractories, in Canada, from Domestic Clays, by Provinces, 1928 and 1929

Province	1928					1929				
	Fireclay		Firebrick		Fireclay blocks and shapes	Fireclay		Firebrick		Fireclay blocks and shapes
	Quantity	Value	Quantity	Value	Value	Quantity	Value	Quantity	Value	Value
	Tons	$	M	$	$	Tons	$	M	$	$
Nova Scotia	2,615	9,705	138	10,799	1,050	2,972	10,669	154	11,340	675
New Brunswick	67	1,848	.....	.....	1,621	47	1,863	.....	.....	1,351
Saskatchewan	1,327	9,183	713	40,582	73,301	754	5,965	808	43,384	106,643
Alberta	.....	.....	84	4,507	.....	48	624	59	2,934	.....
British Columbia	1,114	14,548	4,005	178,572	29,119	1,220	16,105	4,175	193,385	21,742
Canada	**5,123**	**35,284**	**4,940**	**234,460**	**105,091**	**5,041**	**35,226**	**5,196**	**251,043**	**130,411**

Table 334.—Plants Reporting Shipments in the Clay Products Industry in Canada, by Provinces, 1929

Province	Number of plants in groups indicated					
	Brick and tile	Clay sewer pipe	Firebrick and fireclay products	Stoneware and pottery	Kaolin and other clays	**Total**
Nova Scotia	6	1	1	.....	1	9
New Brunswick	2	.....	.....	1	.....	3
Quebec	18	1	1	.....	.....	20
Ontario	128	3	1	2	.....	134
Manitoba	6	.....	.....	.....	.....	6
Saskatchewan	4	.....	.....	.....	.....	4
Alberta	8	.....	1	1	.....	10
British Columbia	9	.....	1	.....	.....	10
Canada	**181**	**5**	**5**	**4**	**1**	**196**

Table 335.—Capital Employed in the Clay Products Industry in Canada, by Provinces, 1928 and 1929

Industry and Province	1928				1929			
	Capital employed as represented by				Capital employed as represented by			
	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	Total
	$	$	$	$	$	$	$	$
By Industries—								
Brick and Tile—								
*Nova Scotia	376,538	60,408	83,298	**520,244**	475,368	79,037	95,707	**650,112**
Quebec	9,043,693	802,217	485,021	**10,330,931**	9,911,417	920,863	610,720	**11,443,000**
Ontario	9,000,199	1,050,323	1,073,082	**11,123,604**	8,514,966	1,215,806	1,265,272	**10,996,044**
Manitoba	166,670	58,610	120,958	**346,238**	274,108	74,989	105,050	**454,147**
Saskatchewan	873,246	76,443	80,426	**1,039,115**	895,884	72,424	134,132	**1,102,440**
Alberta	1,210,456	146,865	148,113	**1,505,434**	1,177,984	145,583	175,412	**1,498,979**
British Columbia	905,604	187,698	133,873	**1,227,175**	1,022,296	175,406	161,264	**1,358,966**
Total for Canada	21,576,406	2,382,564	2,124,771	**26,083,741**	22,272,023	2,684,108	2,547,557	**27,503,688**
Clay sewer pipe—								
Total for Canada	2,745,349	601,476	399,666	**3,746,491**	2,825,250	599,821	269,645	**3,694,716**
Firebrick and fireclay products—								
Total for Canada	1,355,843	239,986	645,887	**2,241,716**	1,418,530	182,460	694,508	**2,295,498**
Kaolin and other clays—								
Total for Canada	.....	.....	.....	.....	.....	.....	.....	.....
Stoneware and pottery—								
Total for Canada	261,836	68,008	71,411	**401,255**	540,755	93,883	61,516	**696,154**
By Provinces—								
Total for clay and clay products—								
Nova Scotia	836,452	140,551	77,394	**1,054,397**	791,818	149,547	84,692	**1,026,057**
New Brunswick	90,271	16,556	8,734	**115,541**	210,039	26,547	21,519	**258,105**
Quebec	9,644,445	961,729	788,032	**11,394,206**	10,512,410	1,067,893	895,997	**12,476,300**
Ontario	11,417,193	1,510,741	1,507,104	**14,435,038**	11,068,103	1,087,749	1,565,464	**14,321,316**
Manitoba	166,670	58,610	120,958	**346,238**	274,108	74,989	105,050	**454,147**
Saskatchewan	873,246	76,443	80,426	**1,039,115**	895,884	72,424	134,132	**1,102,440**
Alberta	2,005,553	339,726	525,214	**2,870,493**	2,249,900	299,277	599,579	**3,148,756**
British Columbia	905,604	187,698	133,873	**1,227,175**	1,054,296	181,846	160,793	**1,402,935**
Canada	**25,939,434**	**3,292,034**	**3,241,735**	**32,473,203**	**27,056,558**	**3,550,272**	**3,573,226**	**34,180,056**

*Includes 1 firm in New Brunswick.

Table 336.—Employees, Salaries and Wages in the Clay Products Industry in Canada, by Provinces, 1928 and 1929

Province	*Average number of employees			Salaries and wages		
	Salaried employees	Wage-earners	Total	Salaries	Wages	Total
1928				$	$	$
Nova Scotia	11	212	223	31,035	154,543	185,578
New Brunswick	4	48	52	18,548	33,586	52,134
Quebec	81	1,140	1,221	153,694	1,003,243	1,156,937
Ontario	200	2,261	2,461	437,193	2,204,257	2,641,450
Manitoba	12	265	277	26,090	117,688	143,778
Saskatchewan	13	140	153	28,834	131,222	160,056
Alberta	29	445	474	68,941	443,324	512,265
British Columbia	19	315	334	41,874	287,326	329,200
Canada	**369**	**4,826**	**5,195**	**806,209**	**4,375,189**	**5,181,398**
1929						
Nova Scotia	18	245	263	30,953	198,434	229,387
New Brunswick	8	89	97	9,965	58,962	68,927
Quebec	91	1,168	1,259	195,371	1,057,432	1,252,803
Ontario	216	2,442	2,658	518,533	2,283,363	2,801,896
Manitoba	12	198	210	27,350	152,931	180,281
Saskatchewan	19	164	183	40,180	161,188	201,368
Alberta	26	443	469	67,505	485,057	552,562
British Columbia	25	366	391	51,588	388,202	439,790
Canada	**415**	**5,115**	**5,530**	**941,445**	**4,785,569**	**5,727,014**

*See note page 37.

Table 337.—Wage-Earners in the Clay Products Industry in Canada, by Months and by Industries, 1929

Month	Brick and tile	Clay sewer pipe	Firebrick and fireclay products	Stoneware and pottery	Kaolin and other clays	Total
January	2,161	348	166	147	16	2,838
February	1,814	290	171	156	14	2,445
March	2,347	242	202	159	.....	2,950
April	3,318	359	206	160	.....	4,043
May	4,358	386	225	154	.....	5,123
June	4,808	386	230	156	6	5,586
July	4,892	398	223	154	8	5,675
August	4,878	399	215	154	8	5,654
September	4,473	394	221	114	8	5,210
October	3,950	392	222	135	8	4,707
November	3,563	379	220	137	8	4,307
December	2,893	370	174	153	8	3,598

IMPORTED-CLAY PRODUCTS

In continuance of the custom followed in previous mineral production reports, a short review of the imported-clay products industry is given herewith.

Manufactures in Canada from imported clays amounted in value to $3,373,038 in 1929. This output was 37 per cent above the corresponding figure of $2,458,801 for 1928 and marked the fifth year in succession in which a new high production value for the industry was established. Among the products made from clays especially imported for the purpose, were porcelain insulators valued at $2,065,404; firebrick and stove lining at $362,236; pottery at $69,140; and other commodities such as sanitary earthenware, sewer pipe, ceramic floor tile, etc., worth $875,909.

Figures on this industry for 1929 cover the operations of 15 plants of which 11 were located in Ontario and 4 in Quebec. These concerns employed a capital of $3,472,052 and gave work to a monthly average of 872 persons throughout the year. Payments for salaries and wages totalled $1,112,881. Purchased materials cost $992,150, and the value added by manufacturing processes was 2,380,888. Production from 11 plants in Ontario amounted in value to $2,465,081 and output from 4 plants in Quebec was worth $909,957.

At St. John's, Quebec, two plants produced sanitary ware from imported ball and china clays, while a third firm manufactured refractory products and vitrified sewer pipe. Refractory products were also made by one firm at Montreal, two at Toronto, one at Port Robinson and one at Hamilton. Earthenware was produced at Hamilton, Ontario. Porcelain insulators were manufactured in Ontario at Georgetown, Hamilton, Niagara Falls and Peterborough. Artware was produced at Oshawa and a plant at Kingston produced ceramic floor tile.

Table 338.—Capital Employed in the Imported-Clay Products Industry in Canada, 1928 and 1929

—	1928	1929
	$	$
CAPITAL EMPLOYED AS REPRESENTED BY—		
Cost of lands, buildings, machinery and tools	1,787,149	1,852,882
Cost of supplies and stocks on hand	642,919	621,365
Cash, trading and operating accounts and bills receivable	638,494	997,805
Total	**3,068,562**	**3,472,052**

Table 339.—Employees, Salaries and Wages in the Imported-Clay Products Industry in Canada, by Provinces, 1928 and 1929

Province	*Average number of employees					Salaries and wages		
	Salaried employees		Wage-earners		Total	Salaries	Wages	Total
	Male	Female	Male	Female				
						$	$	$
1928								
Quebec	27	4	237	6	274	73,431	292,824	366,255
Ontario	38	11	331	42	422	144,464	380,406	524,870
Canada	65	15	568	48	696	217,895	673,230	891,125
1929								
Quebec	22	4	249	6	281	62,038	305,351	367,389
Ontario	45	20	449	77	591	188,797	556,695	745,492
Canada	67	24	698	83	872	250,835	862,046	1,112,881

* See note page 37.

Table 340.—Wage-Earners in the Imported-Clay Products Industry in Canada, by Months, 1928 and 1929

Month	Number		Month	Number	
	1928	1929		1928	1929
January	526	713	July	636	806
February	524	737	August	635	817
March	529	745	September	665	816
April	550	760	October	664	911
May	597	779	November	651	798
June	594	778	December	610	786

LIME

Statistics obtained during the census of 1871 show 1,010 lime kilns in operation in Canada. These kilns were located in Nova Scotia, New Brunswick, Quebec and Ontario. Capital invested in plant and equipment as recorded during that year was $128,508, and employees numbered 2,042, earning $157,943; the value of lime produced was $502,156. A substantial growth was shown in this industry according to data obtained ten years later; active kilns had increased to 1,274 with a corresponding advance in capital investment to a total of $309,354. Employment in 1881 was furnished 2,537 wage-earners who received $203,631 and the value of lime produced was $707,132.

Of the total amount of lime produced in 1929, chemical works used nearly 45 per cent or 298,364 tons; pulp and paper mills consumed 103,171 tons or about 15 per cent, and a slightly smaller quantity went to the building trades. Smelters used somewhat more than 7 per cent and of the remaining 18 per cent, small quantities were used in sugar refineries, tanneries, and for agricultural purposes, while about 15 per cent was sold for unspecified uses.

Considerably more than half the quantity of lime produced in Canada during 1929 was produced in the province of Ontario and almost 25 per cent was produced in Quebec. In the order named the following provinces produced the remainder: Nova Scotia, British Columbia, Manitoba, New Brunswick and Alberta.

Table 341.—Production of Lime in Canada, 1920-1929

(For the years 1886 to 1919 see Mineral Production of Canada 1928)

Year	Bushels	Value	Year	Bushels	Value
		$			$
1920	9,427,334	3,818,553	1925	10,256,542	3,387,652
1921	6,879,066	2,781,197	1926	11,825,736	3,781,484
1922	8,972,971	3,165,005	1927	12,707,221	3,923,388
1923	10,035,319	3,266,608	1928	14,539,686	4,534,568
1924	9,136,952	3,178,541	1929	19,259,639	5,908,610

Table 342.—Production of Lime in Canada, 1928 and 1929, Showing Purposes for Which Sold or Used

Purpose for which sold or used	1928				1929			
	Quicklime		Hydrated lime		Quicklime		Hydrated lime	
	Bushels	Value	Tons	Value	Bushels	Value	Tons	Value
		$		$		$		$
Building trades	1,330,657	478,496	43,620	572,571	45,904	469,742	53,025	694,669
Chemical works	4,380,972	1,282,493	1,187	14,596	297,855	2,397,989	509	5,799
Glass works	190,400	55,757	.....	.....	8,509	70,695	500	6,240
Smelters	1,086,657	191,540	108	1,230	48,689	209,861	.....	.....
Pulp and paper mills	2,879,657	718,534	4,375	39,966	97,071	691,849	6,100	56,754
Sugar refineries	288,171	80,572	.....	.....	8,279	70,707	.....	.....
Tanneries	98,943	28,949	366	3,342	1,963	16,398	110	1,171
Agricultural uses (fertilizer)	20,171	4,657	2,168	18,057	365	2,440	2,396	21,274
Dealers (uses unspecified)	976,943	292,007	17,808	204,917	44,651	433,883	17,051	201,066
Other consumers	1,002,286	419,186	10,337	127,698	27,297	344,595	12,913	153,478
Total sold or used	**12,254,857**	**3,552,191**	**79,969**	**982,377**	**580,583**	**4,708,159**	**93,504**	**1,200,451**

Table 343.—Production of Lime in Canada, by Provinces, 1927-1929

Province		Quicklime		Hydrated Lime		Total	
		Sold or used		Sold or used		Sold or used	
		Tons	Value	Tons	Value	Tons	Value
			$		$		$
Nova Scotia	1927	30,552	100,134	10	120	30,562	100,254
	1928	35,534	167,386	620	8,490	36,154	175,876
	1929	41,001	143,787	1,000	10,400	42,001	154,187
New Brunswick	1927	12,009	148,321	.....	.....	12,009	148,321
	1928	11,236	130,484	25	300	11,261	130,784
	1929	11,766	135,981	3,752	38,572	15,518	174,553
Quebec	1927	97,077	725,876	10,576	80,789	107,653	806,665
	1928	102,859	795,999	11,271	100,783	114,130	896,782
	1929	157,414	1,183,148	9,478	81,046	166,892	1,264,194
Ontario	1927	198,383	1,657,552	44,749	540,687	243,132	2,198,239
	1928	228,101	1,870,476	49,085	597,367	277,186	2,467,843
	1929	314,243	2,624,284	55,915	740,127	370,158	3,364,411
Manitoba	1927	14,741	123,831	7,973	122,448	22,714	246,279
	1928	20,006	173,127	8,331	146,572	28,337	319,699
	1929	22,178	186,377	10,068	174,727	32,246	361,104
Alberta	1927	4,571	46,947	.....	.....	4,571	46,947
	1928	6,672	69,588	.....	.....	6,672	69,588
	1929	7,681	79,569	.....	.....	7,681	79,569
British Columbia	1927	16,175	279,230	7,936	97,453	24,111	376,683
	1928	24,512	345,131	10,637	128,865	35,149	473,996
	1929	26,300	355,013	13,291	155,579	39,591	510,592
Canada	**1927**	**373,509**	**3,081,891**	**71,244**	**841,497**	**444,753**	**3,923,388**
	1928	**428,920**	**3,552,191**	**79,969**	**982,377**	**508,889**	**4,534,568**
	1929	**580,583**	**4,708,159**	**93,504**	**1,200,451**	**674,087**	**5,908,610**

Table 344.—Imports into Canada and Exports of Lime, 1927-1929

Item	1927		1928		1929	
	Tons	Value	Tons	Value	Tons	Value
		$		$		$
Imports	5,784	70,075	5,417	64,811	4,448	49,395
Exports	21,069	367,939	20,043	357,085	24,238	428,209

Table 345.—Capital Employed in the Lime Industry in Canada, by Provinces, 1928 and 1929

Province	1928				1929			
	Capital employed as represented by				Capital employed as represented by			
	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	**Total**	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	**Total**
	$	$	$	$	$	$	$	$
Nova Scotia	56,495	2,600	3,200	**62,295**	57,515	4,944	6,297	**68,756**
New Brunswick	107,500	28,450	11,500	**147,450**	112,500	25,500	28,500	**166,500**
Quebec	1,279,684	179,843	306,665	**1,766,192**	1,612,404	174,574	225,445	**2,012,423**
Ontario	2,177,855	240,340	244,043	**2,662,238**	2,466,818	230,258	113,708	**2,810,784**
Manitoba	487,061	46,046	3,230	**536,337**	548,563	44,002	3,043	**595,608**
Alberta	146,741	30,123	21,989	**198,853**	152,254	33,213	29,676	**215,143**
British Columbia	1,335,840	93,260	149,614	**1,578,714**	1,375,029	70,358	90,076	**1,535,463**
Canada	**5,591,176**	**620,662**	**740,241**	**6,952,079**	**6,325,083**	**582,849**	**496,745**	**7,404,677**

Table 346.—Employees, Salaries and Wages in the Lime Industry in Canada, by Provinces, 1928 and 1929

Province	*Average number of employees			Salaries and wages		
	Salaried employees	Wage-earners	**Total**	Salaries	Wages	**Total**
1928				$	$	$
New Brunswick*	1	51	**52**	1,800	57,372	**59,172**
Quebec	9	58	**67**	16,540	47,501	**64,041**
Ontario	22	297	**319**	37,810	272,220	**310,030**
Manitoba	41	443	**484**	81,830	468,422	**550,252**
Alberta	7	112	**119**	12,968	82,684	**95,652**
British Columbia	4	28	**32**	5,700	31,868	**37,568**
Canada	16	129	**145**	28,084	171,316	**199,400**
	100	**1,118**	**1,218**	**184,732**	**1,131,383**	**1,316,115**
1929						
Nova Scotia	1	54	**55**	900	49,570	**50,470**
New Brunswick	9	74	**83**	15,840	57,942	**73,782**
Quebec	13	394	**407**	19,357	362,162	**381,519**
Ontario	53	410	**463**	67,352	427,234	**494,586**
Manitoba	9	137	**146**	13,579	98,572	**112,151**
Alberta	4	29	**33**	5,500	35,604	**41,104**
British Columbia	20	175	**195**	36,076	203,404	**239,480**
Canada	**109**	**1,273**	**1,382**	**158,604**	**1,234,488**	**1,393,092**

* See note page 37.

Table 347.—Wage-Earners in the Lime Industry in Canada, by Provinces and by Months, 1929

Month	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Alberta	British Columbia	Canada
January	53	57	371	411	87	24	183	**1,186**
February	53	54	341	403	88	24	182	**1,145**
March	56	53	299	350	97	22	195	**1,072**
April	52	52	366	372	114	29	189	**1,174**
May	53	65	395	426	134	31	184	**1,288**
June	52	86	455	383	157	31	177	**1,341**
July	48	80	429	394	162	34	182	**1,329**
August	47	77	378	389	160	30	172	**1,253**
September	48	76	398	384	153	26	186	**1,271**
October	52	81	403	390	144	30	188	**1,288**
November	48	85	354	333	142	27	178	**1,167**
December	48	68	325	281	134	29	164	**1,049**

SAND AND GRAVEL

Production statistics for the sand and gravel industry in Canada were first collected in 1912. Prior to that year the only data available consist of Customs' records of sand and gravel exported. In 1886 exportations amounted to 124,865 tons; twenty-four years later exports had risen to 624,824 tons appraised at $407,974. During 1912, production was valued at $1,512,099 and wages paid to the 875 pit employees totalled $527,425. It was not until 1916 that tonnage statements were obtained from the operators in this industry; the total for that year amounted to 8,156,207 tons at $1,838,320. Since 1918, the annual production has exceeded the 10-million-ton mark. The highest market valuation per ton for this material was received in 1920, when 11,530,795 tons were sold for $4,201,067. During that year, the 186 producers employed 1,546 men whose total earnings were $1,343,212.

Sand and gravel production in Canada during 1929 amounted to 27,846,945 tons valued at $7,317,814 as compared with 28,102,917 tons at $5,809,431 produced in 1928.

Imports of sand and gravel into Canada during the year totalled 269,426 tons worth $216,918. Silica sand imported for glass and carborundum manufacture and for use in steel foundries amounted to 233,963 tons at $490,558, including 197,997 tons from the United States, 35,913 tons from Belgium, and small shipments from the United Kingdom and France.

In 1929 the sand and gravel industry in Canada furnished employment to 8,758 persons whose earnings totalled $2,505,225. Excluding statistics regarding the sand and gravel operations of railway companies, the fixed and current assets of the 541 other operators in this industry amounted to $9,154,055. Fuel and electricity used in 1929 cost $285,491.

Table 348.—*Production of Sand and Gravel in Canada, 1920-1929

(For the years 1886 to 1919 see Mineral Production of Canada 1928)

Year	Tons	Value	Year	Tons	Value
		$			$
1920	11,530,795	4,201,067	1925	11,018,647	3,220,410
1921	11,574,862	2,537,249	1926	17,112,798	4,941,434
1922	11,666,374	3,502,935	1927	22,952,819	6,055,601
1923	12,752,515	3,016,518	1928	28,102,917	5,809,431
1924	11,603,500	3,181,083	1929	27,846,945	7,317,814

Table 349.—Production in Canada, Imports and Exports of Sand and Gravel, 1927-1929

Kind	1927		1928		1929		
	Tons	Value	Tons	Value	Washed or screened	Bank or Pit-run	Total value
		$		$	Tons	Tons	$
PRODUCTION—							
Sand—							
Moulding sand	86,541	56,017	42,060	46,404	7,659	56,798	50,308
Building sand and sand for concrete, roads, etc.	4,416,014	1,162,936	2,380,366	829,659	2,207,745	501,544	1,181,261
Filter sand	.....	.....	4,500	18,000	.....	.....	.....
Core sand*	.....	.....	.....	.....	3,000	8,015	10,168
Other sand (including blast, core and engine sands)	139,772	47,117	111,326	31,724	.....	324,235	63,097
Sand and Gravel—							
Sand and gravel for railway ballast	8,294,927	1,167,916	11,981,398	1,198,360	23,041	11,175,050	1,257,424
Sand and gravel for concrete, roads, etc.	9,309,091	3,259,678	12,530,310	3,061,139	3,247,771	9,307,323	4,087,132
Filter gravel	.....	.....	4,000	16,000	.....	.....	.....
Crushed gravel	706,474	361,937	1,048,957	608,145	785,618	199,146	668,424
Total	**22,952,819**	**6,055,601**	**28,102,917**	**5,809,431**	**6,274,834**	**21,572,111**	**7,317,814**
IMPORTS—							
Sand, silica for glass and carborundum manufacture, etc.	148,831	346,138	154,384	332,338	233,967	490,558	
Sand and gravel, n.o.p.	289,741	200,470	588,211	275,322	269,426	216,918	
Total	**438,572**	**546,608**	**742,595**	**607,660**	**503,393**	**707,476**	
EXPORTS	637,627	177,999	797,111	232,422	1,903,312	441,798	

*Included with other sand in 1927 and 1928.

Table 350.—Production of Sand and Gravel in Canada, by Railway Operators, 1927-1929

Kind	1927		1928		1929	
	Tons	Value	Tons	Value	Tons	Value
		$		$		$
Sand—						
Moulding sand	1,250	1,669	.....	.....	425	225
Building sand and sand for concrete, roads, etc.	13,018	10,112	71,701	12,477	7,817	3,082
Other sand (including blast, core and engine sands)	83,261	13,127	95,100	15,896	301,653	50,562
Sand and Gravel—						
Sand and gravel for railway ballast	7,729,663	937,653	11,957,131	1,195,710	10,534,345	1,236,364
Sand and gravel for concrete, roads, etc.	130,795	50,660	1,473,022	160,567	664,773	68,161
Total	**7,957,993**	**1,013,221**	**13,596,954**	**1,384,650**	**11,509,013**	**1,358,394**

Table 371.—Production of Sand and Gravel in Canada, by Operators Other than Railways, 1927-1929

Kind	1927		1928		1929		
	Tons	Value	Tons	Value	Washed or screened	Bank or pit-run	Value
		$		$	Tons	Tons	$
Sand—							
Moulding sand	85,285	54,348	42,060	46,404	7,659	56,373	50,083
Building sand and sand for concrete, roads, etc.	4,402,996	1,152,824	2,308,665	817,182	2,207,745	493,727	1,178,179
Filter sand	.....	.....	4,500	18,000	.....	.....	.....
Core sand	.....	.....	.....	.....	3,000	8,015	10,168
Other sand (including blast, core and engine sands)	56,511	33,990	16,226	15,828	.....	22,582	12,535
Sand and Gravel—							
Sand and gravel for railway ballast	565,204	230,263	24,267	2,650	23,041	640,705	21,060
Sand and gravel for concrete, roads, etc.	9,178,296	3,209,018	11,057,288	2,900,572	3,247,771	8,642,550	4,018,971
Filter gravel	.....	.....	4,000	16,000	.....	.....	.....
Crushed gravel	706,474	361,937	1,048,957	608,145	785,618	199,146	668,424
Total	**14,994,826**	**5,042,380**	**14,505,963**	**4,424,781**	**6,274,834**	**10,063,098**	**5,959,420**

Table 352.—Production of Sand and Gravel in Canada, by Provinces, 1927-1929

Kind	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia
1927								
Sand—								
Moulding sand.....tons	30	.....	.....	85,965	435	.....	.....	111
$	75	.....	.....	54,806	453	.....	.....	683
Building sand.....tons	67	.....	3,328,414	980,863	56,548	9,365	7,086	33,671
$	25	.....	696,691	426,118	19,843	7,560	2,833	9,860
Other sand (including blast, core and engine sands).....tons	3,440	1,295	48,228	53,647	4,057	18,850	3,375	6,880
$	2,591	370	6,746	31,470	1,196	2,450	563	1,731
Sand and Gravel—								
Sand and gravel for railway ballast.....tons	128,855	368,228	1,493,512	1,934,930	995,344	1,426,247	1,149,166	798,645
$	16,144	114,460	288,172	198,602	130,963	214,619	104,641	100,315
Sand and gravel for concrete, roads, etc.....tons	680,584	18,543	3,744,536	3,823,518	248,648	37,689	215,737	539,836
$	503,888	3,938	879,098	1,395,948	65,626	20,665	161,083	229,432
Crushed gravel.....tons	.....	.....	1,048	633,840	28,548	25,650	17,388	.....
$	.....	.....	10,224	298,785	10,574	17,800	24,554	.....
Total.....tons	**812,976**	**388,066**	**8,615,738**	**7,512,763**	**1,333,580**	**1,517,801**	**1,392,752**	**1,379,143**
$	**522,723**	**118,768**	**1,880,931**	**2,405,729**	**228,655**	**263,100**	**293,674**	**342,021**
1928								
Sand—								
Moulding sand.....tons	30	.....	.....	41,505	162	.....	.....	363
$	75	.....	.....	44,241	120	.....	.....	1,968
Building sand and sand for concrete, roads, etc.....tons	305	1,323	1,119,304	1,063,231	56,788	4,085	21,369	113,961
$	35	132	354,036	410,262	23,397	872	9,286	31,639
Filter sand.....tons	.....	.....	4,500	.....	.....	.....	.....	.....
$	.....	.....	18,000	.....	.....	.....	.....	.....
Other sand (including blast, core and engine sands).....tons	2,657	2,807	.....	15,802	49,776	21,654	8,343	10,287
$	2,391	1,400	.....	13,448	7,638	3,524	813	2,510
Sand and Gravel—								
Sand and gravel for railway ballast.....tons	85,749	451,706	2,337,895	2,931,604	1,272,009	1,601,486	1,875,077	1,425,812
$	13,156	44,468	178,594	247,339	154,260	196,054	185,049	179,440
Sand and gravel for concrete, roads, etc.....tons	18,525	24,223	4,662,133	5,664,392	231,760	537,549	639,671	752,057
$	11,446	6,782	1,123,300	1,115,246	60,665	186,025	261,703	295,972
Filter gravel.....tons	.....	.....	4,000	.....	.....	.....	.....	.....
$	.....	.....	16,000	.....	.....	.....	.....	.....
Crushed gravel.....tons	189,000	11,352	8,509	672,874	43,434	60,750	31,248	31,790
$	84,600	1,401	11,352	399,771	15,926	45,000	32,555	18,140
Total.....tons	**296,266**	**491,471**	**8,136,341**	**10,389,408**	**1,653,929**	**2,225,524**	**2,575,708**	**2,331,270**
$	**111,103**	**54,183**	**1,701,282**	**2,230,307**	**262,006**	**431,475**	**489,406**	**529,669**
1929								
Sand—								
Moulding sand.....tons	60	.....	170	62,738	1,028	.....	.....	461
$	150	.....	106	48,047	895	.....	.....	1,110
Building sand and sand for concrete, roadwork, etc.....tons	102	.....	1,084,178	1,454,023	60,499	3,244	36,902	70,341
$	169	.....	419,798	703,067	23,538	1,350	16,154	17,185
Core sand.....tons	3,176	.....	.....	7,362	477	.....	.....	.....
$	2,858	.....	.....	6,826	484	.....	.....	.....
Other sand (including blast sand, engine sand, etc.).....tons	.....	1,634	25,444	23,694	155,953	1,175	6,851	109,484
$	.....	574	8,152	8,308	24,771	279	1,290	19,723
Sand and Gravel—								
Sand and gravel for railway ballast.....tons	221,887	498,451	1,146,095	2,785,954	1,278,089	2,642,881	1,097,037	1,527,697
$	31,235	32,478	226,396	281,806	180,287	293,730	91,349	120,143
Sand and gravel for concrete, road building, etc.....tons	68,557	19,271	3,932,494	6,353,889	163,151	795,379	550,257	672,096
$	70,729	12,313	872,822	1,968,918	36,027	352,287	299,948	474,088
Crushed gravel.....tons	38,817	6,501	14,850	670,908	122,888	54,000	30,883	45,917
$	46,227	802	7,425	445,407	56,428	40,000	39,252	32,883
Total.....tons	**332,599**	**525,857**	**6,203,231**	**11,358,568**	**1,782,085**	**3,496,679**	**1,721,930**	**2,425,996**
$	**151,368**	**46,167**	**1,534,699**	**3,462,379**	**322,430**	**687,646**	**447,993**	**665,132**

Table 353.—Capital Employed in the Sand and Gravel Industry in Canada, by Provinces, 1928 and 1929

Province	1928				1929			
	Capital employed as represented by				Capital employed as represented by			
	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	**Total**	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	**Total**
	$	$	$	$	$	$	$	$
Quebec	1,076,843	36,477	120,501	**1,233,821**	993,003	41,362	125,777	**1,160,142**
Ontario	4,180,122	66,997	252,415	**4,499,534**	5,881,519	141,595	372,473	**7,398,587**
Manitoba	314,051	24,262	124,590	**462,903**	355,566	34,182	164,268	**554,016**
Saskatchewan	80,000	3,000	.....	**83,000**	80,000	3,000	.....	**83,000**
Alberta	323,000	4,800	2,000	**329,800**	325,000	4,800	2,000	**331,800**
British Columbia	1,139,825	15,305	18,947	**1,174,077**	577,344	10,296	38,870	**626,510**
Canada	**7,113,841**	**159,841**	**518,453**	**7,783,135**	**8,215,432**	**235,235**	**703,388**	**9,154,055**

Table 354.—Employees, Salaries and Wages in the Sand and Gravel Industry by Provinces, 1928 and 1929

Province	*Average number of employees			Salaries and wages		
	Salaried employees	Wage-earners	**Total**	Salaries	Wages	**Total**
				$	$	$
1928						
Nova Scotia	.....	195	**195**	.....	47,787	**47,787**
New Brunswick	.....	74	**74**	.....	13,449	**13,449**
Quebec	10	4,635	**4,645**	17,902	657,122	**675,024**
Ontario	60	1,295	**1,355**	127,089	863,525	**990,614**
Manitoba	8	275	**283**	14,560	101,413	**115,973**
Saskatchewan	4	473	**477**	7,000	148,898	**155,898**
Alberta	1	386	**387**	1,700	177,412	**179,112**
British Columbia	12	403	**415**	31,494	259,117	**290,611**
Canada	**95**	**7,736**	**7,831**	**199,745**	**2,268,723**	**2,468,468**
1929						
Nova Scotia	.....	167	**167**	.....	54,863	**54,863**
New Brunswick	.....	74	**74**	.....	15,160	**15,160**
Quebec	18	5,782	**5,800**	22,203	743,148	**765,351**
Ontario	60	1,065	**1,125**	113,451	826,491	**939,942**
Manitoba	8	275	**283**	16,785	112,558	**129,343**
Saskatchewan	4	550	**554**	8,000	185,031	**193,031**
Alberta	2	366	**368**	2,800	148,579	**151,379**
British Columbia	11	376	**387**	26,505	229,561	**256,156**
Canada	**103**	**8,655**	**8,758**	**189,834**	**2,315,391**	**2,505,225**

* See note page 37.

Table 355.—Wage-Earners in the Sand and Gravel Industry in Canada, by Months and by Provinces, 1929

Month	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	**Canada**
January	.....	1	96	195	4	2	44	143	**485**
February	2	1	54	294	14	2	44	135	**546**
March	2	1	103	375	9	2	84	195	**771**
April	47	1	167	692	60	102	167	240	**1,476**
May	74	12	542	877	131	228	233	237	**2,334**
June	147	35	5,554	908	154	317	169	221	**7,505**
July	114	43	5,519	987	164	236	141	233	**7,437**
August	83	30	424	849	199	168	185	168	**2,106**
September	78	43	382	839	48	142	117	139	**1,788**
October	54	11	305	792	51	60	127	164	**1,564**
November	23	1	226	658	58	19	63	121	**1,169**
December	5	1	84	435	14	2	5	84	**630**

SAND-LIME BRICK

Because of its association with other building materials, data regarding the production of sand-lime brick are included in this report. Statistics relating to sand-lime brick are not included in the totals for structural materials industries as both the sand and lime used have been so recorded; production of sand-lime brick is regarded as a manufacturing operation and therefore is shown in the report on the *Manufactures of the Non-Metallic Minerals*, issued annually by the Bureau.

Production from the sand-lime brick industry in Canada during 1929 was valued at $953,726, a decline of 14 per cent from the record established in the previous year at $1,112,466, but 15 per cent higher than the average reported for the five-year period, 1924-1928. Output of sand-lime brick during the year under review amounted 78,361,000, worth $953,726 as against a total of 82,271,000, valued at $1,038,510 in 1928 when the balance of the output consisted of hollow building blocks.

In 1929 a total of 12 plants were operating in Canada, 7 of which were located in Ontario, 2 in Quebec, 2 in Manitoba, and 1 in Alberta. These concerns employed a capital of $2,356,726 and distributed $341,005 in salaries and wages to a monthly average of 304 employees. Purchased materials cost $264,465 and the value added by manufacturing processes was $689,261.

Table 356.—Sand-Lime Brick Manufactured in Canada, by Provinces, 1927-1929

Province	1927		1928		1929	
	Quantity	Value	Quantity	Value	Quantity	Value
	M	$	M	$	M	$
Quebec	8,182	96,926	14,122	203,249	8,745	114,617
Ontario	61,297	721,485	61,506	745,719	60,400	708,584
Manitoba	3,385	46,500	6,643	89,542	7,150	99,527
Alberta	.....	.....	.....	.....	2,066	30,998
Total	**72,864**	**864,911**	**82,271**	**1,038,510**	**78,361**	**953,726**

SLATE

Slate deposits located along the south shore of the St. Lawrence river in Quebec, were operated for the first time in 1854. Production from these deposits reached a maximum in point of value in 1889 when 6,935 tons valued at $119,160 were shipped. These shipments consisted of roofing slates, mantles and slabs. Quarrying operations were carried on at the Quebec deposits up to 1923, in which year 1,836 tons of crushed green and red slate were shipped for use in the manufacture of roofing material. No production has been recorded since that date.

During 1908, a slate quarry was operated at Jarvis Inlet, British Columbia.

Table 357.—Production of Slate in Canada, 1886-1929

Year	Tons*	Value	Year	Tons*	Value	Year	Tons*	Value
		$			$			$
1886	5,345	64,675	1899	.....	33,406	1912	1,894	8,939
1887	7,357	89,000	1900	.....	12,100	1913	1,432	6,444
1888	5,314	90,689	1901	715	9,980	1914	1,075	4,837
1889	6,935	119,160	1902	.....	19,200	1915	397	2,039
1890	6,368	100,250	1903*	5,510	22,040	1916	1,262	6,223
1891	5,000	65,000	1904	5,277	23,247	1917	1,422	7,789
1892	5,180	69,070	1905	.....	21,568	1918	933	5,124
1893	7,112	90,825	1906	.....	24,446	1919*	1,632	10,853
1894	.....	75,550	1907	4,335	20,056	1920	(a)	14,200
1895	.....	58,900	1908	2,950	13,496	1921	(b)	22,325
1896	.....	53,370	1909	4,000	19,000	1922	1,899	14,871
1897	.....	42,800	1910	3,959	18,492	1923	1,836	17,289
1898	.....	40,791	1911	1,833	8,248	1924-1929	.....	.....
						Total	.....	**1,326,292**

*1903 to 1919 inclusive quantity recorded in squares.
(a) 1,532 squares valued at $12,362 and 240 tons crushed slate at $1,838.
(b) 415 squares valued at $4,063 and 2,232 tons crushed slate at $18,262.

Table 358.—Imports of Slate into Canada, 1927-1929

—	1927		1928		1929	
	Quantity	Value	Quantity	Value	Quantity	Value
		$		$		$
Roofing.....Squares	6,427	73,00[illegible]	7,453	95,468	9,504	123,793
School-writing	.....	72,101	.....	83,248	.....	96,296
Pencils	.....	7,02[illegible]	.....	8,036	.....	9,358
Mantles and manufactures of slate, n.o.p	.....	53,934	.....	52,544	.....	67,151
Total	.....	**206,066**	.....	**239,296**	.....	**296,638**

THE STONE INDUSTRY IN CANADA

Including (1) The Stone Quarrying Industry and (2) The Monumental and Ornamental Stone Industry

(1) PRIMARY PRODUCTION—The Stone Quarrying Industry

Statistics of the stone industry as set forth in the general tables of this report have been confined to quarrying operations and to the production of dressed stone when this operation is carried on in conjunction with the quarrying. The kinds of stone quarried in Canada include granite (trap-rock, syenite and other igneous rock), limestone, marble and sandstone. In 1929, granite was produced in Nova Scotia, New Brunswick, Quebec, Ontario and British Columbia; limestone was obtained in all provinces except Prince Edward Island and Saskatchewan; marble was quarried in Nova Scotia, Quebec, Manitoba and British Columbia; and the sandstone output had its source in Nova Scotia, New Brunswick, Quebec, Ontario, Alberta and British Columbia.

The value of limestone production has advanced from a total of $2,139,691 in 1909 to $8,172,681 in 1929. During the latter year 79·2 per cent of the production was marketed as crushed stone for concrete aggregates, road metal and similar uses; 1·6 per cent as building, monumental and ornamental stone; 5·8 per cent for flux; 4 per cent for use in sugar factories and chemical works; the remainder, 9·4 per cent consisted of rubble and riprap and small tonnages of flag-stones, agricultural limestone and poultry grit. Considerable tonnages of limestone are also quarried for use in the production of cement and lime.

The production of marble in Canada during the period 1886-1896 was relatively small, totalling 3,391 tons valued at $45,837. From 1897 to 1907, inclusive, records do not show any production of marble in Canada. With the opening of quarries at Philipsburg and South Stukely, Quebec; at Bancroft and Marble Bluff, Ontario; in the Pas area, Manitoba; and on Nootka Sound and Lardeau, British Columbia, the production became of considerable importance in 1908 marble shipments were valued at $125,000 but in 1912 an advance to a total valuation of $260,764 was made. The maximum output value for the industry of $521,572 was reached In 1926 when 3,442 tons of marble for building purposes and 1,853 tons of crushed marble were shipped from Quebec and Ontario deposits. The 1929 production totalled 14,012 tons valued at $414,062.

Table 359.—Production of Granite in Canada, 1920-1929

(For the years 1886 to 1919 see Mineral Production of Canada, 1928)

Year	Tons	Value	Year	Tons	Value
		$			$
1920	.....	1,508,916	1925	971,718	2,014,535
1921	319,398	937,894	1926	1,064,423	1,574,627
1922	457,925	1,486,250	1927	730,049	1,383,557
1923	398,432	1,159,303	1928	1,195,810	2,366,946
1924	419,971	1,013,345	1929	1,728,165	3,080,815

Table 360.—Production of Limestone and Sandstone in Canada, 1920-1929

(For the years 1886 to 1919 see Mineral Production of Canada, 1928)

Year	Limestone		Sandstone		Year	Limestone		Sandstone	
	Tons	Value	Tons	Value		Tons	Value	Tons	Value
		$		$			$		$
1920	.....	5,665,693	.....	105,149	1925	4,643,853	5,049,563	87,502	145,757
1921	3,322,024	5,155,046	28,426	78,036	1926	5,283,745	5,657,328	44,127	112,347
1922	3,152,124	4,175,941	25,221	80,908	1927	6,438,379	7,145,917	132,799	232,793
1923	3,687,663	4,475,921	22,766	66,547	1928	6,949,420	7,267,437	100,951	223,236
1924	4,249,061	4,831,684	94,603	240,273	1929	7,720,840	8,172,681	159,407	398,974

Table 361.—Production of Marble in Canada, 1920-1929

(For the years 1886 to 1919 see Annual Report Mineral Production of Canada, 1928)

Year	Tons	Value	Year	Tons	Value
		$			$
1920	.....	240,593	1925	3,046	254,922
1921	1,650	172,720	1927	5,295	521,572
1922	1,912	231,864	1927	5,209	503,037
1923	2,473	201,518	1928	7,753	414,682
1924	4,379	322,455	1929	14,012	414,062

Table 362.—Production of Stone in Canada, by Provinces, Showing Purposes for Which Used, 1928

Item		Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Alberta	British Columbia	Canada
Building—									
Rough	tons	1,183	55	99,488	110,106	11,227	.....	2,027	224,086
	$	14,194	633	233,947	107,754	52,805	.....	14,541	423,874
Dressed	tons	12	1,478	37,134	58,669	9,033	158	350	106,834
	$	1,349	19,201	1,262,258	85,287	335,121	9,500	15,000	1,727,716
Monumental and ornamental—									
Rough	tons	256	817	10,675	115	.....	.....	870	12,733
	$	3,328	16,548	126,327	1,869	.....	.....	31,280	179,352
Dressed	tons	580	458	708	60	.....	.....	1,055	2,861
	$	36,618	30,833	16,737	2,193	.....	.....	51,300	137,681
Flagstone	tons	.....	.....	300	1,636	.....	.....	.....	1,936
	$	.....	.....	218	14,924	.....	.....	.....	15,142
Curbstone	tons	.....	133	21,404	.....	.....	.....	.....	21,537
	$	.....	2,250	118,847	.....	.....	.....	.....	121,097
Paving blocks	tons	.....	119	22,531	5,433	.....	.....	10	28,093
	$	.....	1,270	138,842	44,649	.....	.....	200	184,961
Limestone, for flux	tons	70,500	.....	1,331	155,433	.....	.....	29,649	256,913
	$	72,765	.....	1,723	117,863	.....	.....	24,181	216,532
Limestone for sugar factories, chemical works, etc.	tons	.....	15,017	159,724	45,547	.....	2,177	37,259	259,724
	$	.....	23,525	133,657	55,088	.....	3,720	51,985	267,975
Poultry grit	tons	.....	.....	100	10	.....	5	172	287
	$	.....	.....	655	50	.....	30	1,159	1,891
Ground limestone for agricultural use	tons	1,850	9,415	11,133	2,285	.....	.....	279	24,962
	$	6,555	28,245	42,375	2,285	.....	.....	1,813	81,273
Rubble and riprap	tons	8,115	12,500	359,602	98,718	95,400	.....	45,876	620,211
	$	14,991	14,596	351,495	91,807	96,513	.....	43,940	613,342
Crushed	tons	38,672	6,340	2,268,062	4,103,917	120,204	2,670	153,892	6,693,757
	$	63,975	5,880	2,422,119	3,517,799	123,778	11,490	156,421	6,301,462
Total	**tons**	**121,168**	**46,332**	**2,992,192**	**4,581,929**	**235,864**	**5,010**	**271,439**	**8,253,934**
	$	**213,775**	**142,981**	**4,849,200**	**4,641,568**	**608,217**	**24,740**	**391,820**	**10,272,301**
Per cent of total	Quantity	1·47	0·57	36·25	55·51	2·85	0·06	3·29	100·00
	Value	2·08	1·39	47·21	39·34	5·92	0·24	3·82	100·00

Table 363.—Production of Stone in Canada, by Provinces, Showing Purposes for Which Used, 1929

Item		Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Alberta	British Columbia	Canada
Building—									
Rough	tons	5,487	194	56,959	21,194	35,015	.....	3,878	**122,727**
	$	71,027	4,673	271,148	111,285	210,891	.....	42,893	**711,917**
Dressed	tons	25	1,592	45,420	3,971	12,261	208	45	**63,522**
	$	1,000	87,624	1,387,474	79,481	558,505	12,500	4,200	**2,139,784**
Monumental and ornamental—									
Rough	tons	157	882	8,226	133	35	.....	196	**9,629**
	$	1,844	14,752	102,667	2,745	450	.....	5,282	**127,740**
Dressed	tons	430	574	1,094	70	.....	.....	984	**3,852**
	$	11,760	42,353	46,628	2,626	.....	.....	51,165	**154,532**
Flagstone	tons	.....	.....	114	1,645	.....	.....	.....	**1,759**
	$	.....	.....	114	17,541	.....	.....	.....	**17,655**
Curbstone	tons	.....	301	35,321	.....	39	.....	123	**35,784**
	$	.....	3,614	221,748	.....	393	.....	1,010	**226,765**
Paving blocks	tons	.....	1,572	10,717	5,717	.....	.....	3	**18,009**
	$	.....	15,675	93,123	50,479	.....	.....	50	**159,327**
Limestone, for flux	tons	106,692	.....	206	318,910	.....	743	27,046	**453,597**
	$	109,509	.....	309	243,868	.....	1,500	21,613	**376,799**
Limestone for sugar factories, chemical works, etc	tons	.....	17,580	90,638	155,068	.....	2,906	52,844	**319,036**
	$	.....	28,600	97,228	137,947	.....	5,242	81,380	**350,397**
Poultry grit	tons	.....	.....	.....	3,000	.....	.....	56	**3,056**
	$	.....	.....	.....	12,000	.....	.....	522	**12,522**
Ground limestone for agricultural use	tons	1,525	2,130	22,790	2,127	.....	.....	172	**28,744**
	$	5,875	4,260	59,288	1,702	.....	.....	708	**71,833**
Rubble and riprap	tons	6,724	.....	635,567	130,844	25,463	.....	148,475	**947,073**
	$	11,439	.....	583,365	111,040	20,365	.....	135,195	**841,404**
Crushed	tons	143,666	2,427	2,576,819	4,596,993	119,296	1,326	175,109	**7,615,636**
	$	163,768	3,419	2,474,767	3,965,549	104,413	5,304	167,637	**6,884,857**
Total	**tons**	**261,706**	**27,352**	**3,484,471**	**5,239,672**	**192,103**	**5,183**	**408,931**	**9,622,424**
	$	**376,222**	**204,970**	**5,317,859**	**4,736,263**	**895,017**	**24,516**	**511,655**	**12,066,532**
Per cent of total	Quantity	2·75	0·28	36·22	54·45	2·00	0·05	4·25	**100·00**
	Value	3·12	1·70	44·07	39·25	7·42	0·20	4·24	**100·00**

Table 364.—Production of Stone in Canada, by Kinds and by Provinces, 1928 and 1929

Province	Granite		Limestone		Marble		Sandstone	
	Tons	Value	Tons	Value	Tons	Value	Tons	Value
1928		$		$		$		$
Nova Scotia	39,360	102,295	72,350	79,320	160	2,975	9,298	29,185
New Brunswick	5,485	66,435	30,772	57,650	.....	.....	10,075	18,896
Quebec	230,660	1,241,668	2,684,305	3,116,753	6,643	380,307	70,584	110,472
Ontario	605,275	566,601	3,967,098	3,421,064	.....	.....	9,556	53,903
Manitoba	114,000	114,000	121,864	494,217	.....	.....	.....	.....
Alberta	.....	.....	4,852	15,240	.....	.....	158	9,500
British Columbia	201,030	275,947	68,179	83,193	950	31,400	1,280	1,280
Canada	**1,195,810**	**2,366,946**	**6,949,420**	**7,267,437**	**7,753**	**414,682**	**100,951**	**223,236**
1929								
Nova Scotia	76,742	98,357	175,981	199,384	132	2,515	11,851	75,966
New Brunswick	5,142	91,610	20,710	33,360	.....	.....	1,500	80,000
Quebec	508,471	1,623,860	2,827,740	3,139,389	13,081	397,074	135,179	157,536
Ontario	850,927	926,977	4,380,706	3,759,357	.....	.....	8,039	49,929
Manitoba	.....	.....	191,506	885,826	603	9,191	.....	.....
Alberta	.....	.....	4,975	12,046	.....	.....	208	12,500
British Columbia	286,883	340,011	119,222	143,319	196	5,282	2,630	23,043
Canada	**1,728,165**	**3,080,815**	**7,720,840**	**8,172,681**	**14,012**	**414,062**	**159,407**	**398,974**

Table 365.—Production of Stone in Canada by Kinds, Showing Purposes for Which Used, 1928

Kind	Granite		Limestone		Marble		Sandstone	
	Tons	Value	Tons	Value	Tons	Value	Tons	Value
		$		$		$		$
Building—								
Rough	9,409	107,042	207,310	248,312	480	19,642	6,887	48,878
Dressed	11,865	667,050	91,886	702,081	1,870	340,585	1,213	18,000
Monumental and ornamental—								
Rough	8,933	127,652	3,000	30,000	800	21,700	.....	.....
Dressed	2,486	125,744	225	2,237	150	9,700	.....	.....
Flagstone	.....	.....	305	418	.....	.....	1,631	14,724
Curbstone	21,537	121,097	.....	.....	.....	.....	.....	.....
Paving blocks	28,093	184,961	.....	.....	.....	.....	.....	.....
Limestone, for flux	.....	.....	256,913	216,532	.....	.....	.....	.....
Stone for sugar factories, chemical works, etc.	.....	.....	257,825	265,212	1,899	2,763	.....	.....
Poultry grit	3	60	184	1,179	100	655	.....	.....
Ground limestone for agricultural use	.....	.....	24,962	81,273	.....	.....	.....	.....
Rubble and riprap	173,123	163,294	414,470	406,863	.....	.....	32,618	43,185
Crushed stone	940,361	870,046	5,692,340	5,313,330	2,454	19,637	58,602	98,449
Total	**1,195,810**	**2,366,946**	**6,949,420**	**7,267,437**	**7,753**	**414,682**	**100,951**	**223,236**

Table 366.—Production of Stone in Canada by Kinds, Showing Purposes for Which Used, 1929

Kind	Granite		Limestone		Marble		Sandstone	
	Tons	Value	Tons	Value	Tons	Value	Tons	Value
		$		$		$		$
Building—								
Rough	15,082	137,353	93,766	432,959	914	22,927	12,965	118,678
Dressed	23,869	746,537	36,037	944,491	1,908	347,256	1,708	92,500
Monumental and ornamental—								
Rough	9,272	121,053	126	955	231	5,732	.....	.....
Dressed	3,153	149,810	699	4,722	.....	.....	.....	.....
Flagstone	.....	.....	129	264	.....	.....	1,630	17,391
Curbstone	35,745	226,372	39	393	.....	.....	.....	.....
Paving blocks	18,009	159,327	.....	.....	.....	.....	.....	.....
Limestone, for flux	.....	.....	453,597	376,799	.....	.....	.....	.....
Limestone for sugar factories, chemical works, etc.	.....	.....	311,686	339,739	7,350	10,658	.....	.....
Poultry grit	2	10	3,054	12,512	.....	.....	.....	.....
Ground limestone for agricultural use	.....	.....	28,744	71,833	.....	.....	.....	.....
Rubble and riprap	231,038	204,287	677,837	591,385	.....	.....	38,198	45,732
Crushed stone	1,391,995	1,336,066	6,115,126	5,396,629	3,609	27,489	104,906	124,673
Total	**1,728,165**	**3,080,815**	**7,720,840**	**8,172,681**	**14,012**	**414,062**	**159,407**	**398,974**

Table 367.—Production in Canada, by Kinds and by Provinces, Imports and Exports of Stone, 1927-1929

—	1927		1928		1929	
	Tons	Value	Tons	Value	Tons	Value
		$		$		$
PRODUCTION, BY KINDS—						
Granite	730,049	1,383,557	1,195,810	2,366,946	1,728,165	3,080,815
Limestone	6,438,379	7,145,917	6,949,420	7,267,437	7,720,840	8,172,681
Marble	5,209	503,037	7,753	414,682	14,012	414,062
Sandstone	132,799	232,793	100,951	223,236	159,407	398,974
Total	**7,306,436**	**9,265,304**	**8,253,934**	**10,272,301**	**9,622,424**	**12,066,532**
PRODUCTION, BY PROVINCES—						
Nova Scotia	72,451	120,807	121,168	213,775	264,706	376,222
New Brunswick	29,908	121,091	46,332	142,981	27,352	204,976
Quebec	2,534,531	4,268,315	2,992,192	4,849,200	3,484,471	5,317,859
Ontario	4,254,960	4,060,709	4,581,929	4,041,568	5,239,672	4,736,263
Manitoba	154,666	318,556	235,864	608,217	192,109	895,017
Alberta	3,367	7,830	5,010	24,740	5,183	24,546
British Columbia	256,553	367,996	271,439	391,820	408,931	511,655
Canada	**7,306,436**	**9,265,304**	**8,253,934**	**10,272,301**	**9,622,424**	**12,066,532**
IMPORTS—						
Building stone, other than marble or granite, sawn on more than two sides, but not sawn on more than four sides	500	6,793	306	4,085	471	6,285
Building stone other than marble or granite, planed, turned, cut or further manufactured than sawn on four sides	190	14,333	259	27,781	1,826	77,685
Flagstone, granite, rough sandstone, and all building stone, not hammered, sawn or chiselled	.....	183,777	.....	214,977	.....	307,013
Flagstone and building stone, other than marble or granite, sawn on not more than two sides	.....	101,006	.....	213,448	.....	233,084
Granite, rough, not hammered or chiselled	.....	.....	.....	.....	.....	65,036
Granite, sawn only	.....	5,250	.....	7,637	.....	22,799
Granite, manufactures of, n.o.p.	.....	188,364	.....	63,932	.....	44,857
Granite monuments*	.....	.....	.....	129,466	.....	137,359
Paving blocks	.....	.....	.....	10,919	.....	.....
Marble, rough, not hammered or chiselled	.....	92,077	.....	137,120	.....	237,680
Marble, sawn or sand rubbed, not polished	.....	151,288	.....	170,074	.....	267,497
Marble, manufactures of, n.o.p.	.....	103,603	.....	126,729	.....	187,717
Refuse stone	352,467	213,609	597,134	373,453	645,768	405,077
Manufactures of stone, n.o.p.	.....	50,000	.....	70,826	.....	76,364
Total	.....	**1,110,100**	.....	**1,550,447**	.....	**2,068,453**
EXPORTS—						
Crushed stone	46,772	66,820	128,379	209,852	116,950	200,000
Granite and marble, unwrought	3,314	33,289	2,529	26,034	2,467	23,189
Freestone, limestone, and other building stone, unwrought	712	7,437	383	3,664	661	8,867
Dressed stone	.....	33,760	.....	10,665	.....	5,065
Total	.....	**141,306**	.....	**250,215**	.....	**237,121**

*From April 1, 1928.

Table 368.—Capital Employed in the Stone Quarrying Industry in Canada, by Provinces, 1928 and 1929

Province	1928				1929			
	Capital employed as represented by				Capital employed as represented by			
	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	**Total**	Cost of lands, buildings, machinery and tools	Cost of supplies and stocks on hand	Cash, trading and operating accounts and bills receivable	**Total**
	$	$	$	$	$	$	$	$
Nova Scotia	1,103,499	19,257	5,192	**1,127,948**	1,102,598	23,130	10,336	**1,136,064**
New Brunswick	138,811	22,727	36,341	**197,879**	86,100	21,596	22,807	**130,503**
Quebec	3,923,816	606,103	975,481	**5,505,400**	4,783,119	470,271	986,142	**6,239,532**
Ontario	6,866,465	403,907	654,433	**7,924,805**	9,792,035	519,874	687,879	**10,999,788**
Manitoba	373,531	78,315	88,577	**540,423**	714,796	143,882	217,857	**1,076,535**
Alberta	4,000	.....	.....	**4,000**	4,000	.....	.....	**4,000**
British Columbia	628,879	48,667	49,546	**727,092**	839,227	85,341	78,768	**1,003,336**
Canada	**13,039,001**	**1,178,976**	**1,809,570**	**16,027,547**	**17,321,875**	**1,264,094**	**2,003,789**	**20,589,758**

Table 369.—Employees, Salaries and Wages in the Stone Industry in Canada, by Provinces, 1928 and 1929

Province	*Average number of employees			Salaries and Wages		
	Salaried employees	Wage-earners	Total	Salaries	Wages	Total
				$	$	$
1928						
Nova Scotia	6	86	92	9,195	79,217	88,412
New Brunswick	11	89	100	24,568	77,479	102,047
Quebec	126	2,690	2,816	241,480	2,215,272	2,156,752
Ontario	89	1,581	1,670	190,223	1,356,414	1,546,637
Manitoba	14	257	271	35,863	359,853	395,716
British Columbia	.....	9	9	.....	7,500	7,500
	12	159	171	26,305	183,145	209,450
Canada	**258**	**4,871**	**5,129**	**527,634**	**4,278,880**	**4,806,514**
1929						
Nova Scotia	7	163	170	12,454	154,621	167,075
New Brunswick	9	123	132	20,264	98,494	118,758
Quebec	158	2,892	3,050	238,792	2,452,577	2,691,369
Ontario	108	1,609	1,717	233,479	1,512,882	1,746,361
Manitoba	20	375	395	52,120	376,114	428,234
Alberta	.....	7	7	.....	10,147	10,147
British Columbia	14	196	210	30,002	267,815	297,817
Canada	**316**	**5,365**	**5,681**	**587,111**	**4,872,650**	**5,459,761**

*See note page 37.

Table 370.—Wage-Earners in the Stone Industry in Canada, by Months and by Provinces, 1929

Month	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Alberta	British Columbia	Canada
January	120	48	1,130	652	124	8	138	2,220
February	147	56	1,168	638	107	8	96	2,220
March	118	90	1,185	982	180	10	171	2,736
April	136	110	1,606	1,382	315	12	180	3,741
May	158	125	2,266	1,833	343	12	188	4,925
June	165	153	2,673	1,897	516	11	186	5,601
July	231	156	2,887	2,012	513	6	194	5,999
August	237	153	3,032	1,969	530	6	212	6,139
September	193	148	2,914	1,667	555	4	208	5,689
October	158	154	2,750	1,413	547	4	208	5,234
November	135	141	2,434	967	414	4	206	4,302
December	94	112	1,682	645	264	2	185	2,924

(2) The Monumental and Ornamental Stone Industry

This industry includes the cutting, polishing or other finishing of stone in plants not operated in conjunction with quarries.

Production from the 220 stone dressing works in the Dominion rose to a new high level of $8,224,060 in 1929 as compared with a total of $7,176,034 in 1928. These totals include cut and polished stone for ornamental, monumental and building purposes; the largest single item for 1929 was limestone for building which was valued at $2,739,504. Distribution by provinces of the plants in operation during 1929 was as follows: Ontario, 116; Quebec, 45; Manitoba, 13 British Columbia, 11; New Brunswick, 11; Nova Scotia, 10; Saskatchewan, 7; Alberta, 5; and Prince Edward Island, 2. Stone used in these plants during 1929 cost $2,788,934 at the works; capital employed amounted to $7,107,162; employees numbered 1,863, and salaries and wages totalled $3,048,084.

Table 371.—Number of Plants, Employees and Value of Products of the Monumental and Ornamental Stone Industry in Canada, by Provinces, 1928 and 1929

Province	1928			1929		
	Number of plants	Number of employees	Selling value of products	Number of plants	Number of employees	Selling value of products
			$			$
Prince Edward Island and Nova Scotia	12	45	162,066	12	48	188,772
New Brunswick	10	73	146,846	11	74	180,850
Quebec	45	324	1,081,091	45	413	1,486,177
Ontario	118	963	4,739,095	116	1,002	5,064,697
Manitoba	13	132	396,303	13	143	547,773
Saskatchewan	8	53	302,054	7	62	280,263
Alberta	5	53	201,868	5	59	216,685
British Columbia	11	43	146,711	11	62	258,837
Canada	**222**	**1,686**	**7,176,034**	**220**	**1,863**	**8,224,060**

Table 372.—Products of the Monumental and Ornamental Stone Industry in Canada, 1928 and 1929

Item	1928	1929
	Total selling value at works	Total selling value at works
	$	$
Granite, cut and polished—(a) Monuments	1,718,988	1,815,463
(b) For building purposes	314,553	465,185
Marble, cut and polished—(a) Monuments	404,058	391,947
(b) For building purposes	883,075	1,621,112
Marble chips and dust	24,677	23,802
Limestone—(a) Monuments and bases	132,406	325,876
(b) For building purposes	2,861,336	2,739,504
Finished monuments, lettered only	773,975	785,748
Other products	62,966	55,423
Total	**7,176,034**	**8,224,060**

CHAPTER X

DIRECTORY

In the following pages the names and addresses of all the principal operators in the Canadian mining industry are given and the location of the properties worked in 1929 is also shown.

METAL MINING INDUSTRIES

Alluvial Gold Mining Industry

Name	Address	Location
QUEBEC		
Mill Creek Gold Mines	Beauceville	Beauceville.
BRITISH COLUMBIA		
Adams, Geo	Atlin	McKee Creek.
Big Bend Platinum & Gold Co	Tulameen	Tulameen River.
Bride, Maurice	Atlin	Lyn Creek.
Brown, F. and Highland, V	Atlin	Wright Creek.
Cassiar Hydraulic Mines, Ltd	Wrangel, Alaska	Cassiar District.
Cariboo Eagle Mine	Cottonwood	Cariboo District.
Campbell, Robert	Grand Forks	McRae Creek.
Cayosh Falls Mining Co	1305 Burnaby St., Vancouver	Lillooet Mining Div.
Cavanagh & Stevens	Rosswood	
Carwford, Frank	Porter Landing	Cassiar District.
Carinelle Placers Ltd	602 Stock Exchange Bldg., Vancouver.	
Compagnie Français des Mines	Atlin	Atlin Mining Div.
Daly & Johnston	Big Bar Creek	Clinton Mining Div.
Dang Sang	Barkerville	Slough Creek.
Dease Creek Mines Corp	401 Mutual Life Bldg., Seattle, Wash., U.S.A.	Dease Creek.
Drayton, W. A	Fort Steele	Fort Steele Mining Div.
Duplex Placer Mining Co	3467 Pt. Grey Rd., Vancouver	Wreck Bay, Vancouver Island.
East Kootenay Ruby Co., Ltd	Natal	Ruby Creek.
Falck, Emil M	Cottonwood	Anderson Creek.
Falconer, D. K	Discovery	Spruce Creek.
Forty Nine Creek Placers, Ltd	414 Ward St., Nelson	Forty Nine Creek.
French Creek Development Co	502 Howe St., Vancouver	Revelstoke.
Guest Placer Mining Camp	456 Seymour St., Vancouver	Coalmont.
Hartman, C. W	Princeton	Similkameen.
Hobson Creek Mining Co	210 Northwest Bldg., Vancouver	Kamloops Mining Division.
Kemp, H. and Lackie, C	206 Mercantile Bldg., Vancouver	Cariboo District.
Keller, E	Lumberton	Ft. Steel Min. Div.
Lowhee Mining Co	1109 Rust Bldg., Tacoma, Wash., U.S.A.	Cariboo Dist.
McConkell, R. S	Fort St. James	Germensen Creek.
Moses, Wm	Coalmont	Tulameen river.
Morse, H. O. and McKechnie, Wm	Atlin	Last Chance Creek.
Mosquito Hydraulic Association	727—23rd Ave. S., Seattle, Wash., U.S.A.	Nosquita Creek.
Murphy, Nathan	Atlin	O'Donnell River.
Omineca Gold Dredging Co	715 Lloyd Bldg., Vancouver	Manson Creek.
Pierre River Syndicate	410 Rogers Bldg., Vancouver	Yale Mining Div.
Paymore Mines, Ltd	Louis Creek	Kamloops Min. Div.
Pruiet, Thomas	Atlin	Last Chance Creek.
Pini Marco & Co	Atlin	Spruce Creek.
Point Hydraulic Mining Co	Barkerville	Slough Creek.
Price, Burroughs & Scott	Beaver Mouth.	
Roddick, J. P	Barkerville	Barkerville Area.
Slade, W. C	Cottonwood	Cariboo District.
Stevens, Joel	Barkerville	Williams Creek.
Sutherland & Anderson	Likely	Spanish Creek.
Southeran, Garnet	Tulameen	Similkameen Min. Div.
Sundberg, M	Cottonwood	Donovan Creek.
Tong Sing Tong	Barkerville	Slough Creek.
Tong Lee	Hazelton	Vital Creek.
Tregillus, F. and House, J. S	Barkerville	Cunningham Creek.
Turnquist, Emil	Atlin	Ruby Creek.
Wing & Benjamin	Telegraph Creek	Quartz Creek.
Wendle, Jas	Barkerville	Cariboo District.
Williams, Jas. F	Cariboo	Last Chance Creek.
Yeager, A. C	Lumberton	Fort Steel Mining Div.
YUKON		
Yukon Cons. Gold Corp	Central Chambers, Ottawa, Ont	Yukon.

Auriferous Quartz Mining Industry

Name	Address	Name of Mine	Location
NOVA SCOTIA			
Acadia Gold Mines, Ltd.	Enfield	Acadia	Oldham.
Novomac Mines and Power Corporation (formerly Consolidated Mines and Power Corp.)	Halifax, Box 216	Goldenville	Goldenville.
*Pleasant River Gold Mines Ltd	Box 348, Kentville	Pleasant River	Lunenburg Co.
Victory Gold Mines Ltd	Goldboro	Victory	Stormont.
QUEBEC			
Arntfield Gold Mines Ltd	159 Bay St., Toronto	Arntfield	Boischatel Tp.
*Graham Bousquet Mining Corporation	603 Royal Bank Building, Toronto, Ont.	Graham Bousquet	Bousquet Tp.
*Malartic Gold Mines Ltd	530 Excelsior Life Bldg., Toronto, Ont.	Malartic	Fournier Tp.
O'Brien and Fowler Ltd	816 Ottawa Electric Bldg., Ottawa, Ont.		Cadillac Tp.
*Siscoe Gold Mines Ltd	276 St. James St., Montreal	Siscoe	Dubuisson Tp.
*Thompson Cadillac Mining Co., Ltd	200 Bay St., Toronto, Ont.		Cadillac Tp.
ONTARIO			
Afton Townships—			
*Afton Mines, Ltd	Box 1933, Sudbury	Golden Rose	Afton Tp.
Boston Creek Area—			
Barry-Hollinger Gold Mines, Ltd	807 General Assurance Bldg., Toronto.	Barry-Hollinger	Pacaud Tp.
*Boston McCrea Gold Mines Ltd	510 Kent Bldg., Toronto	Boston McCrea	Pacaud Tp.
*Telluride Gold Mines Ltd	Northern Ontario Bldg., Toronto.	Telluride	Skead Tp.
Frontenac Area—			
*Ore Chimney Mining Co	Northbrook	Ore Chimney	Barrie Tp.
Kenora Area—			
*Kenora Prospectors and Miners, Ltd.	Kenora	Mikado	Shoal Lake.
Kirkland Lake Area—			
*Benoit Gold Mines Ltd	Sun Life Bldg., Hamilton, Ont.	Benoit	Benoit Tp.
*Bidgood Consolidated Mines, Ltd	171 Yonge St., Toronto	Bidgood	Lebel Tp.
*Continental Kirkland Mines, Ltd	Box 752 Kirkland Lake	Continental Kirkland	Lebel Tp.
*Federal Kirkland Mining Co., Ltd	208 Northern Ontario Bldg., Toronto.	Federal Kirkland	Teck and Lebel Tps.
Kirkland Lake Gold Mining Co., Ltd.	810 Lumsden Bldg., Toronto	Kirkland Lake	Teck Tp.
Lake Shore Mines Ltd	Kirkland Lake	Lake Shore	Teck Tp.
*Scott Kirkland Gold Mines	Arnprior	Scott-Kirkland	Teck Tp.
Sylvanite Gold Mines Ltd	Kirkland Lake	Sylvanite	Teck Tp
Teck-Hughes Gold Mines Ltd	Kirkland Lake	Teck-Hughes	Teck Tp.
*Tough Oakes, Burnside Gold Mines	Kirkland Lake	Tough Oakes	Teck and Lebel Tps.
*Trout Creek Gold Mining Co., Ltd	Bank of Commerce Bldg., St. Catharines.	Trout Creek Gold Mine.	Teck Tp.
Wright-Hargreaves Mines Ltd	Bridgeburg	Wright-Hargreaves	Teck Tp.
Larder Lake Area—			
*East Main Gold Mines Ltd	Argonaut	East Main	Gauthier Tp.
*Kirkland Gold Belt Mines	Kent Bldg., Toronto	Gold Belt	Lebel Tp.
*Murphy Mines Ltd	208 Northern Ontario Bldg., Toronto.	Murphy	Gauthier Tp.
*Northland Gold Mines Ltd	Northland Mines	Northland Gold	Gauthier Tp.
*Ritchie Gold Mines Ltd	11 King St. W., Toronto	Ritchie Gold	Gauthier Tp.
*Walsh-Katrine Gold Mines, Ltd	1006-1410 Stanley St., Montreal, P.Q.	Walsh-Katrine	Katrine Tp.
Lightning River Area—			
*Harker Gold Mines Ltd	Concourse Bldg, Toronto	Harker	Harker Tp.
Michipicoten Arm—			
Cooper Gold Mines, Ltd	Star Bldg., Toronto	Cooper	Algoma Dist.
*Towagmac Exploration Co., Ltd	921 New Birks Bldg., Montreal, P.Q.	Michael-Boyle Option	Goudreau.
Mongowin Tp.—			
*McMillan Gold Mines, Ltd	52 Elm St., Sudbury	House Lake	Mongowin.
Northwestern Ontario Area—			
*Bonanza United Mines, Ltd	806 Royal Bank Bldg., Toronto	Bonanza, Rognon, Redeemer.	Van Horne.
*British Canadian Mines Ltd	8 Bloor St. E., Toronto	Foley	Rainy River Tp.
Gold Rock Mining Syndicate	Electric Bldg., Ottawa	Gold Rock	Manitou Lake.
*Moss Mines Ltd	132 St. James St., Montreal	Huronian	Kashabowie.
Northern Red Lake Mines Ltd	Mine Centre	Golden Star	Rainy River.
Wabigoon Contact Gold Mines Ltd.	615 W. 150th. St., New York, N.Y.	Wabigoon-Contact	Dryden.
Patricia Area—			
Bathurst Mines, Ltd	51 Sparks St., Ottawa	Bathurst	Skinner Tp.
Bobjo Mines, Ltd	372 Bay St., Toronto	Bobjo	Jackson Manion, P.O.
*Howey Gold Mines, Ltd	Concourse Bldg., Toronto	Howey	Red Lake.
Porcupine Area—			
Ankerite Gold Mines, Ltd	Box 535, South Porcupine	Ankerite	Deloro Tp.
*Canusa Mining and Exploration Co., Ltd.	Metropolitan Bldg., Toronto	Canusa	Whitney Tp.
Coniaurum Mines, Ltd	Schumacher	Coniaurum	Tisdale Tp.
Dome Mines, Ltd	36 Toronto St., Toronto	Dome	Tisdale Tp.

Auriferous Quartz Mining Industry—Concluded

Name	Address	Name of Mine	Location
ONTARIO—*Concluded*			
Hollinger Consolidated Gold Mines, Ltd.	Timmins	Hollinger	Tisdale Tp.
March Gold Ltd	Box 533, South Porcupine	March Gold	Deloro Tp.
McIntyre Porcupine Mines, Ltd	Schumacher	McIntyre, Porcupine	Schumacher.
Porcupine United Ltd	Timmins	Porcupine-United	Deloro Tp.
*Polaris Gold Mines of Canada, Ltd	Box 1691 Timmins	Polaris	Mount Joy Tp.
Vipond Consolidated Mines, Ltd	Star Bldg., Toronto	Vipond	Tisdale Tp.
West Dome Lake Gold Mines, Ltd	New Liskeard	West Dome	Tisdale Tp.
Sudbury Area—*			
*Mundell, Wm. A	Metagama	Ina	Sudbury Dist.
Temiskaming District—			
*Gold Hill Mines, Ltd	Haileybury	Gold Hill	Catharine Tp.
Thunder Bay Area—			
St. Anthony Gold Mines Ltd	25 Melinda St., Toronto	St. Anthony	Sturgeon Lake.
*Tashota Gold Mines Ltd	Tashota	Tashota	Kowkash Division.
West Shining Tree Area—			
*Davidson-Carr	Imperial Bldg., Hamilton	Davidson-Carr	Sturgeon Lake.
*The Buckingham Mines, Ltd	116 Federal Bldg., Toronto	Buckingham	Asquith and McMurchy Tps.
MANITOBA			
Central Manitoba Mines, Ltd	301 Mining Exchange Bldg., Winnipeg.	Central Manitoba	Long Lake Dist.
*Eldorado Gold Mines, Ltd	319 Bay St., Toronto, Ont	Eldorado	Long Lake Dist.
*San Antonio Mines Ltd	Bissett, Man	San Antonio	Rice Lake.
BRITISH COLUMBIA			
*B.C. Silver Mines, Ltd	612 Pacific Bldg., Vancouver	B.C. Silver	Portland Canal.
*Columario Gold Mines, Ltd	357 Bay St., Toronto, Ont	Valhalla-Kleanza	Omineca Mining District
Hedley Gold Mining Co., Ltd	Hadley	Nickel Plate	Osoyoos Mining Div.
Hope Gold Mines Ltd	744 Hastings St., Vancouver	Hope	Yale Div.
*Marmot River Gold Mines, Ltd	313 Crown Bldg., Vancouver	Marmot River Gold	Portland Canal District.
McCarthy, J. F	Grand Forks	Union	Kettle Valley.
Midnight Mining Co	Rossland	Midnight	Rossland.
Pioneer Gold Mines of B.C., Ltd	Pioneer Mine	Pioneer	Lillooet Dist.
*Pre Cambrian Gold Mines	1827 L.C. Smith Bldg., Seattle Wash., U.S.A.	Pre Cambrian Gold	Yale Mining Division.
Premier Gold Mining Co., Ltd	London Bldg., Vancouver	Premier	Cassiar Dist.
Relief Arlington Mines Ltd	Erie, B.C	Second Relief	Nelson Mining Division.
Reno Gold Mines, Ltd	Salmo	Reno	Sheep Creek.
*Paul H. Schulz (Hecla Mining Co.)	Grand Forks	Union Mine	Kettle Valley Dist.
Thurlow Gold Mines Ltd	207 Hastings St., Vancouver	Thurlow	Thurlow Island.
Waterloo Consolidated Mines Ltd	Penticton	Waterloo	Kettle River Dist.

Copper-Gold-Silver Mining Industry

Name	Address	Name of Mine	Location
QUEBEC			
Abana Mines, Limited	134 King St East, Toronto, Ont.	Abana	Desmeloizes Tp.
*Abbey Mines, Limited	132 St. James St., Montreal	Abbey	Desmeloizes Tp.
*Aldermac Mines, Limited	921 New Birks Building, Montreal.	Aldermac	Boischatel Tp.
*Amulet Mines, Limited	Room F16 Transportation Building, 132 St. James St., Montreal.	Amulet	Rouyn Tp.
*Area Mines, Limited	132 St. James St., Montreal	Area	Duprat-Duverny-Rouyn Tps.
*Arutfield Gold Mines, Limited	302 Old Birks Building, Montreal	Arutfield	Boischatel Tp.
*Arrowhead Consolidated Mines, Limited.	412, New Birks Building, Montreal.		Jeannes Tp.
*Bay Consolidated Mines, Limited	P.O. Box 111, Station B, Montreal.		Rouyn Tp.
*Bellehumeur Mining Company, Limited	38 King St. West, Toronto, Ont Ont.		Laverlochère Tp.
*Boischatel Mines, Limited	610 Blackburn Bldg., Ottawa, Ont.		Rouyn Tp.
*Brown Bousquet Mines, Limited	Keefer Bldg., Montreal		Bousquet Tp.
*Buffalo Rouyn Mines, Limited	603 Royal Bank Bldg., Toronto 2, Ont.		Boischatel, Duprat and Rouyn Tps.
*Cadillac Mining and Development Syndicate, Limited.	Box 842, Rouyn		Duprat Tp.

Copper-Gold-Silver Mining Industry—Continued

Name	Address	Name of Mine	Location
QUEBEC—*Continued*			
*Colbec Copper Nickel Syndicate, Limited.	26 Fraser Building, Ottawa, Ont.		Pontiac County.
*Canada Québec Mining Corporation, Limited.	132 St. James St., Montreal		Desmeloizes and Fournière Tps.
*Canadian American Copper Refining Company, Limited.	207 Notre Dame St., W., Montreal.		Eastman.
*Canadian Exploration, Limited	126 rue St. Pierre, Quebec		
*Canadian Rouyn Syndicate	709 Stuart Ave., Montreal		Rouyn Tp.
*Cannon, Francis Edward	c/o M. A. Wilson. 311 Temple Bldg., Toronto, Ont.		Dufresnoy Tp.
*Capital Rouyn Gold Mines, Limited	374 1st Ave., Ottawa, Ont		Rouyn, Boischatel and Duprat Tps.—Hause and Hasty Tps., Ont.
*Champlain Rouyn Mines, Limited	Room 404, 266 St. James St. W., Montreal.		Destor Tp.
*Chibougamau McKenzie Mines, Limited.	336 Board of Trade Building, Montreal.		Chibougamau and Obalski Tps.
*Chibougamau Prospectors Limited	824 Royal Bank Bldg., Montreal.		Merritt Island and Cedar Bay.
*Clericy Consolidated Mines, Limited	74 Sparks St., Ottawa, Ont		Clericy Tp.
*Colin's Mining Corporation, Limited	750 rue St. Gabriel, Montreal		Destor Tp.
*Consolidated Copper and Sulphur Company, Limited.	Eustis		Ascot Tp.
Consolidated Mining & Smelting Company of Canada, Limited.	706 Drummond Bldg., Montreal.		Duprat Tp.
*Copper Basin Gold Mines, Ltd	Room 611-159 Craig St. W., Montreal.		Dubuisson Tp.
*Copper Creek Exploration Syndicate	Cheminis, Ontario		Dasserat & Dufay Tps.
*Corona Mines, Ltd	126 St. Peter St., Quebec		Rouyn Tp., Que., and Kamiskotia Dist., Ont.
*Demara Mines, Ltd	Room 116, 276 St. James St., Montreal.		Desmeloizes and Fournière Tps. and Abitibi Dist., Que.; Cold Lake Section, Manitoba.
*Don Rouyn Gold Mines, Ltd	Can. Pac. Express Bldg., Montreal.		Rouyn, Dufresnoy and Malartic Tps.
*Dunlop Consolidated Mines, Ltd	1511-67 Yonge St., Toronto, Ont.		Mattagami Lake, Que.
*Duparquet Mining Co., Ltd	204 Hospital St., Montreal		Duparquet & Destor Tps.
*Duprat Mines, Ltd	126 St. Peter St., Quebec		Duprat and Montbray Tps., Que., and Kamiskotia Dist., Ont.
*Explorer Syndicate	c/o W. M. Goodwin, P.O. Box 141, Ste. Anne de Bellevue.		Rouyn Tp.
*Fosbury Mines, Ltd	824 Royal Bank Bldg., Montreal.		Chibougamau and Lac Doré, Que.
*Gilbec Mines, Ltd	200 Bay St., Toronto, Ont		Dufresnoy Tp.
*Granada Rouyn Mining Co., Ltd	Rouyn	Granada	Rouyn Tp.
*Greene Stabell Mines, Ltd	1406 Concourse Bldg., Toronto, Ont.	Greene Stabell	Dubuisson Tp.
*Kinojevis Mining Co., Ltd	Temiskaming		Rouyn Tp.
*Kitchener Rouyn Mines, Ltd			Clericy Tp.
*Knox Wiltsay Syndicate	New Liskeard		Rouyn Tp.
*La Mine d'Or Vénus, Limitée	104 rue St. Jean, Québec	La Mine d'Or Vénus	Barraute Tp.
*La Reine Mine, Limitée	Amos		
*Laval-Quebec Mines, Ltd	215 St. James St. W., Montreal		La Reine and Rouyn Tps.
*Lavoie-Gill Mining Corporation	801 Lacordaire St., Montreal	Lavoie-Gill	Destor Tp.
*Lemire Gold & Copper Mines, Ltd	74 Sparks St., Ottawa, Ont	Lemire	Hebecourt Tp.
*LeRoy Mines, Ltd	35 Notre Dame St. W., Montreal.		Fiedmont, Senneterre, Castagnier and McKenzie Tps.
*Les Mines Lac Dufault, Ltée	4350 rue St. Denis, Montréal		Arquebelle, Dufresnoy, Dasserat, Desmeloizes and Dupuy Tps.
*Locarno Copper Mines, Ltd	139 Sparks St., Ottawa, Ont		Dufresnoy, Cadillac and Bousquet Tps.
*Mabell Mines, Ltd	410 New Birks Bldg., Montreal	Mabell	Clericy Tp.
*Marillac Mining Syndicate, Ltd	410 Blackburn Bldg., Ottawa Ont.	Marillac	Joannes Tp.
*Mines Development Corp	104 Rue St. Jean, Québec		Barraute Tp.
*Normac Development Co., Ltd	Blackburn Bldg., Ottawa, Ont.		Malartic Tp.
*Natagan Gold Mines, Ltd	115½ avenue Cartier, Québec	Natagan	Barraute Tp.
*National Base Metals Corp	75 Sparks St., Ottawa	Arno	Demeloizes Tp.
*Navarre Mines, Ltd	Concourse Bldg., Toronto	Navarre	Dufresnoy Tp.
*Newbec Mines, Ltd	Noranda	Newbec	Rouyn Tp.
*Nickel and Copper Bar Syndicate	Rouyn		Laberre Tp.
Noranda Mines, Ltd	Royal Bank Bldg., Toronto	Horne	Rouyn Tp.
*Normac Mining Syndicate	Concourse Bldg., Toronto		Boischatel Tp.
*Norman Mines	Blackburn Bldg., Ottawa		Dalquier Tp.

Copper-Gold-Silver Mining Industry—Continued

Name	Address	Name of Mine	Location
BRITISH COLUMBIA—*Concluded*			
*Nova Mines, Ltd.	35 Notre Dame W., Montreal		Duparquet Tp.
*Obalski-Chibougamau Mining Co.	25 St. James St. E., Montreal		Obalski Tp.
*Obasko Mines, Ltd	Kirkland Lake		Louvicourt Tp.
*O'Leary-Malartic Mines, Ltd	Rouyn—Box 249		DuParquet Tp.
*Oriole Mines, Ltd	Continental Life Bldg., Toronto.	Oriole	Montbray Tp.
*Osisko Lake Mines, Ltd	100 Adelaide St. W., Toronto		Rouyn Tp.
*Powell Mining Properties, Ltd	Confederation Life Bldg., Toronto.	Powell	Rouyn Tp.
*Precambrian Holdings, Ltd	Keefer Bldgs, Montreal		Cadillac Tp.
*Quebec Chibougamau Mines, Ltd	500 Place d'Armes, Montreal		Obalski Tp.
*Quebec Copper Corp., Ltd	Noranda		Duprat Tp.
*Quemont Mining Corp., Ltd	350 Bay St., Toronto	Quemont	Rouyn Tp.
*The Ranger-Cadillac Mines, Ltd	Amos		Cadillac Tp.
*Read Authier Mine, Ltd	Amos		Bourlamaque Tp.
*Renault Mining Co., Ltd	10 St. James St. W., Montreal	Renault	Dasserat Tp.
*Renown Mining Co., Ltd	Jackson Bldg., Ottawa	Renown	Boisshatel Tp.
*Rhyolite Rouyn Mines, Ltd	Royal Bank Bldg., Toronto		Duprat Tp.
*Rouyn Chibougamau Mining Co.	105 Mountain Hill, Quebec		Rouyn Tp.
*Rouynda Prospectors, Ltd	77 King St. W., Brockville, Ont.		Duprat Tp.
*Rouyn Western Mines, Ltd	Turner Bldg., Hamilton	Rouyn-Western	Duprat Tp
*Rubec Mines, Ltd	276 St. James St., Montreal	Rubec	Rouyn Dist.
*Sladen-Malartic Mines, Ltd	48 Sparks St., Ottawa		Malartic Tp.
*S. S. Copper Mine, Ltd	70 Wellington St., Sherbrooke		South Stukely
*Stadacona Rouyn Mines, Ltd	132 St. James St., Montreal		Rouyn Dist.
*Star Gold Mines, Ltd	142 Notre-Dame, Trois-Rivières.		Clericy Tp.
*Sullivan Gold Mines, Ltd	159 Craig St. W., Montreal	Sullivan	Dubuisson Tp.
*Suzor Mining Syndicate	Parent, Que		Suzor Tp.
*Syndicate Amulet-Montgomery	4350 St. Denis St., Montreal		Dasserat Tp.
*Thompson Malartic Mines, Ltd	200 Bay St., Toronto		Cadillac Tp.
*Toronto Rouyn Syndicate	Box 103, Rouyn		Rouyn Tp.
*Towagamac Exploration Co., Ltd	New Birks Bldg., Montreal		Gaspé.
*Valco Mines Co., Ltd	8 rue Sault au Matelot, Quebec		Cadillac Tp.
Waite-Ackerman-Montgomery Mines, Ltd.	Noranda	Waite-Montgomery	Duprat Tp.
*Wasamac Mines, Ltd	4350 St. Denis St., Montreal		Dasserat Tp.
*Wendt-Whread Mines, Ltd	1008 Keefer Bldg., Montreal		Launay Tp.
*Wietsey-Coglan Mines, Ltd	Box 125, Noranda		Rouyn Tp.
*Windfall Rouyn Mines, Ltd	New Birks Bldg., Montreal	Kenojevis	Rouyn, Tp.
*Windsor Mines, Ltd	105 Mountain Hill, Quebec	Windsor	La Sarre Tp.
*Wood Cadillac Mines, Ltd	Keefer Bldg., Montreal		Cadillac Tp.
ONTARIO			
Amity Copper and Gold Mines, Ltd	Boston Creek	Amity	Boston Creek.
Patterson Copper Mines, Ltd	Northern Ontario Bldg., Toronto.	Patterson	Boston Creek.
Shield Development Co., Ltd	815 Transportation Bldg., Montreal.	Tip Top	Kashabowie.
*Seymour Copper Mines, Ltd	Rouyn	Seymour	Salter Tp.
*Sudbury Basin Mines, Ltd	100 Adelaide St. W., Toronto	Sudbury Basin	Sudbury.
*Tretheway-Ossian Mines, Ltd	12 King St. E., Toronto	Tretheway-Ossian	Boston Creek.
*White Lake Mines, Ltd	302 Royal Bank Bldg., Toronto.		White Lake.
MANITOBA			
*Flin Flon Mines, Ltd	14 Wall St., New York	Flin Flon	The Pas Dist.
*Mandy Mines, Ltd	Bullitt Bldg., Philadelphia	Mandy	The Pas Dist.
*Manitoba Basin Mining Co., Ltd	200 Bay St., Toronto		Herb Lake.
*Sherritt Gordon Mines, Ltd	100 Adelaide St. W., Toronto.	Sherritt-Gordon	The Pas Dist.
BRITISH COLUMBIA			
Armstrong, R. V	Copper Mountain	Shamrock	Summers Creek.
Aurimont Mines, Ltd	850 Hastings St. W., Vancouver		New Hazelton.
Bayonne Gold Mines, Ltd	Salmo	Bayonne	Nelson Dist.
Britannia Mining and Smelting Co., Ltd.	Britannia Beach	Britannia	Vancouver County.
Cambria Copper Co., Ltd	402 West Pender St., Vancouver.	Cambria	Knight-Inlet.
*Central Copper and Gold Co., Ltd	Standard Bank Bldg., Vancouver.		Texada Island.
*Coalmont Gold Mines, Ltd	470 Granville St., Vancouver	Coalmont	Granite Creek.
*Coast Copper Co., Ltd	Trail	Old Sport	Quatsino Mining Div.
*Consolidated Mining & Smelting Co., Ltd.	Trail	Avax	Kamloops Mining Div.

Copper-Gold-Silver Mining Industry—Concluded

Name	Address	Name of Mine	Location
QUEBEC—*Concluded*			
*Consolidated Mining and Smelting Co., Ltd.	Trail	Iva Fern	Nelson Mining Div.
*Consolidated Mining and Smelting Co., Limited.	Trail	Caledonia	Quatsino M. D.
*Consolidated Mining and Smelting Co., Limited.	Trail	Richmond	Omineca M. D.
*Consolidated Mining and Smelting Co., Limited.	Trail	A. and T.	Portland Canal.
*Consolidated Mining and Smelting Co., Limited. Limited.	Trail		Rossland.
*George Gold Copper Co., Ltd.	Tadanac	George	Portland Canal.
*George Enterprise Mining Co., Ltd.	211 Pemberton Bldg., Victoria	George Enterprise	Portland Canal.
*Golden Age Mining Co., Ltd.	411½ Ward St., Nelson	Golden Age	Nelson M. D.
Granby Consolidated Mining, Smelting and Power Co., Ltd.	Anyox	Bonanza	Naas River M. D.
Granby Consolidated Mining, Smelting and Power Co., Limited.	Anyox	Copper Mountain	Allenby.
Granby Consolidated Mining, Smelting and Power Co., Limited.	Anyox	Hidden Creek	Naas River M. D.
*Keene Mountain Gold & Silver Mines, Ltd.	311 Lancaster Bldg., Calgary.	White Eagle	Poplar.
*Lorne Gold Mines, Ltd.	35 Commerce Bldg., Vancouver.	Lorne	Lillooet M. D.
Marble Bay Copper Mines, Ltd.	Van Anda	Marble Bay	Nanaimo M. D.
Meadow Creek Mines	Box 112, Kamloops	Ford	Kamloops M. D.
Mogul Mining Co., Ltd.	509 Union Bldg., Victoria	Mogul	Greenwood M. D.
Mountain Bay Mining Co., Ltd.	112 St. James St., Montreal	Mountain Bay	Cassiar M. D.
*Mount Diadem Mines, Ltd.	151, 8th Ave., E., Vancouver	Mt. Diadem	Jervis Inlet.
*North Kootney Mines, Ltd.	710 Seymour St., Vancouver	Pretty Girl	Windermere M. D.
*Norway Mining Co., Ltd.	Box 294, Trail	Norway	Trail Creek.
*Pitt Mining Co., Ltd.	511 Randall Bldg., Vancouver.	Pitt	Pitt Lake.
*Quatsino Copper-Gold Mines, Ltd.	1208 Vancouver Block, Vancouver.	Quatsino	Quatsino Sound.
*Radiant Copper, Ltd.	501 B.C. Mining Bldg., Vancouver.		Squamish.
Romana Copper Mines, Ltd.	612 Hastings W., Vancouver	Romana	Nanaimo M. D.
*Seven Sisters Mines, Ltd.	Tadanac, Trail	Seven Sisters	Cedarvale.
*Staples, T. B.	Juneau, Alaska	Tulsequal-Chief	
*Sunloch Mines, Ltd.	Trail	Sunloch	Victoria M. D.
*Surf Point Mines	3857 Point Grey Road, Vancouver.	Surf Point	Porcher Island.

Chrome Mining Industry

Name	Address	Name of Mine	Location
Consolidated Mining and Smelting Co., Ltd.	Trail, B.C.	Flint and Baer	Ashcroft, B.C.

Iron Mining Industry

QUEBEC			
Baie St. Paul Titanic Iron Ore Co.	Baie St. Paul		Baie St. Paul.
*Titanium, Ltd.	20 St. Paul St., Montreal		Ivry, Que.

Molybdenum Mining Industry

*Consolidated Mining and Smelting Co., Ltd.	Trail, B.C.	Molly	Nelson M. D.
Molybdenite Reduction Co., Ltd.	24 St. James St. W., Montreal.		La Corne Tp.
*Saguenay Prospecting Corp., Ltd.	33 Sous le Fort, Quebec		Bergeronnes Tp.

Nickel-Copper Mining Industry

Name	Address	Name of Mine	Location
*Calbec Copper-Nickel Syndicate	Fraser Bldg., Ottawa	Calbec	Calumet Island.
*Falconbridge Nickel Mines, Ltd	100 Adelaide St. W., Toronto	Falconbridge	Sudbury Dist.
International Nickel Co., of Canada, Ltd	Dominion Bank Bldg., Toronto.	Frood, Levack, Creighton, Garson.	Sudbury Dist.
*McVitte-Graham Mines, Ltd	132 St. James St. W., Montreal		Sudbury Dist.
*Mincor, Ltd	350 Bay St., Toronto		Sudbury Dist.

Quicksilver Mining Industry

*Canadian Quicksilver Company, Ltd	315 Vancouver Block, Vancouver, B.C.		Vancouver, Island.

Non-Ferrous Smelting and Refining Industry

Name	Address	Location
QUEBEC		
Aluminum Co. of Canada, Ltd	46 King St. W., Toronto, Ont	Arvida.
Horne Copper Corporation	Rouyn	Rouyn.
ONTARIO		
Deloro Smelting and Refining Co., Ltd	Deloro	Deloro.
Kingdon Mining, Smelting and Manufacturing Co	Galetta	Galetta.
International Nickel Co., of Canada, Ltd	Dominion Bank Bldg., Toronto	Copper Cliff.
BRITISH COLUMBIA		
Consolidated Mining and Smelting Co	Trail	Trail.
Granby Consolidated, Mining, Smelting and Power Co., Ltd.	Anyox	Anyox.

Silver-Cobalt Mining Industry

*Blair Gowganda Mines, Ltd	Barrie, Ont		Gowganda.
Brocklebank, Arthur	Box 929, Cobalt	Kerr Lake	Coleman Tp.
Cain, C. E	Cobalt	Beaver	Coleman Tp.
Castle-Trethewey Mines, Ltd	Bestel, Ont	Castle-Trethewey	Haultain Tp.
Chitty, L	Cobalt	Badger	Coleman Tp.
Clemens, E. H	Box 687, Cobalt	Coningas	Bucke Tp.
Cobalt Contact Mines, Ltd	8 Bloor St. E., Toronto	Contact	Bucke Tp.
*Cobalt Kittson Mines, Ltd	Latchford		Kittson, Tp.
Frontier Lorraine Mines, Ltd	350 Bay St., Toronto	Frontier Lorraine	South Lorraine Tp.
*Kirk Budd Mining Co	221 Arcade Bldg., Utica, N.Y.	Kirk Budd	
Keeley Silver Mines, Ltd	Star Bldg., Toronto	Keeley	South Lorraine.
Jemmet, D. L., Ltd	Cobalt	Aguanico	Bucke Tp.
Keeley Silver Mines, Ltd	Star Bldg., Toronto	Keeley	South Lorraine.
*Kirk Budd Mining Co	221 Arcade Bldg., Utica, N.Y.	Kirk Budd	
La Rose Mines, Ltd	Concourse Boldg., Toronto	La Rose	Cobalt.
*Lorraine Trout Lake Mines, Ltd	350 Bay St., Toronto	Lorraine Trout Lake	Silver Centre.
Martin, G	Cobalt	Crown Reserve	Cobalt.
McKinley Mines Security Co	Cobalt	Savage	Cobalt.
Mining Corporation of Canada, Ltd	350 Bay St., Toronto	Buffalo Townsite, Cobalt Lake.	Cobalt.
*Morrison Mines, Ltd	Booth Bldg., Ottawa	Morrison	Nicol Tp.
Mosher and McKay	Cobalt	McKinley-Darragh	Coleman Tp.
Nipissing Mines Co., Ltd	Excelsior Life Bldg., Toronto	Nipissing	Cobalt.
O'Brien, M. V., Ltd	Ottawa Electric Bldg., Ottawa	O'Brien	Cobalt.
O'Brien, M. V., Ltd	Ottawa Electric Bldg., Ottawa	Miller Lake O'Brien	Gowganda.
Paramount Syndicate	New Liskeard	Paramount	Tudhope.
Pioneer Prospectors, Con. Mines	Northern Ontario Bldg., Toronto.		Leith Tp.
Price, C. W	Cobalt	Foster	Coleman Tp.
Sandoe and Moyle	Box 815, Cobalt	Temiskaming	Coleman Tp.
Seguin, H	Cobalt	Kerr Lake	Coleman Tp.
Shaw, J	New Liskeard	Tretheway	Coleman Tp.
*Shield Development Co., Ltd	815 Transportation Bldg., Montreal.	Old Cochrane	Cobalt.
Ward, R. G	Cobalt		Cobalt.

Silver-Lead-Zinc Mining Industry

Name	Address	Name of Mine	Location
NOVA SCOTIA			
*British Metal Corporation, Ltd	437 St. James St. W., Montreal	Stirling	Richmond County.
QUEBEC			
British Metal Corporation, Ltd	437 St. James S. W., Montreal.	Tetreault	Montauban Tp.
*Clermont Mines, Ltd	85 St. Peter St., Quebec	Clermont	Clermont Tp.
*Federal Zinc and Lead Co., Ltd	602 Drummond Bldg., Montreal.	Federal	Lemieux Tp.
*Huronian Belt Co., Ltd	Star Bldg., Toronto	Goodwin	Lemieux Tp.
*Lyall and Beidelman	Drummond Bldg., Montreal	Beidelman	Lemieux Tp.
New Montauban Zinc and Copper Co., Ltd.	33 Sous le Fort, Quebec	Notre Dame des Anges.	Montauban Tp.
*St. Lawrence Metals, Ltd	132 St. James St., Montreal		Montauban Tp.
*Shawinigan Mining and Smelting Co.	1184 Philipps Place, Montreal.	Montauban	Montauban Tp.
ONTARIO			
*Interprovincial Exploration Co., Ltd	437 St. James St. W., Montreal	Interprovincial	Ben Nevis Tp.
Kingdon Mining and Smelting Co., Ltd.	1122 Beaver Hall Hill, Montreal.	Kingdon	Galetta.
*Lake Geneva Mining Co., Ltd	Geneva	Collins	Hess Tp.
*Metals Development Ltd	702 Royal Bank Bldg., Toronto.		Dent Tp.
Treadwell Yukon Co., Ltd	Bradley, Ont	Errington	Sudbury Dist.
BRITISH COLUMBIA			
Ainsworth Mining Division—			
*Aero Mines Corporation	321 Ginitelle Bldg., Spokane, Wash.	Riverside	Houser Lake.
*Caledonia Mine	Zincton, B.C	Caledonia	Blaylock.
Davys, M. L	Kaslo	Davys Mill	Blaylock.
Empee Mining Co., Ltd	714 Yorkshire Bldg., Vancouver.	Black Prince, Two Friends.	Slocan City.
Giegerich, H	Kaslo	Banker, Montezuma	Kaslo Creek.
Helme, F	Kaslo	Silver Bear	Kaslo Creek.
*Keystone-Charleston Mines, Ltd	Kaslo	Keystone	Retallack.
Kootney Florence Mining Co., Ltd	35 Commerce Bldg., Vancouver.	Kootney Florence	Princess Creek.
Spokane-Trinket Mines	Kaslo	Spokane-Trinket	Ainsworth.
Sturgis Creek Mines, Ltd	501, 1st St. W., Calgary, Alta.	Ravenue	Kaslo.
Arrow-Lake Mining Division—			
*Consolidated Mining and Smelting Co., Ltd.	Trail, B.C	Hailstorm	Burton.
Fort Steele Mining Division—			
*Consolidated Mining and Smelting Co., Ltd.	Trail	Estella	Fort Steele.
Consolidated Mining and Smelting Co., Ltd.	Trail	St. Eugene	Moyie.
Consolidated Mining and Smelting Co., Ltd.	Trail	Sullivan	Kimberley.
*Moyie River Mining & Dev. Co., Ltd.	Box 639, Fernie, B.C	Royal Crown	Moyie River.
*St. Eugene Extension Mines Ltd	214 Pemberton Bldg., Victoria	St. Eugene Extension	Moyie.
Thompson, O. C	Salmo	North Star	Kimberley.
Greenwood Mining Division—			
Beaver Silver Mines Ltd	509 Union Bldg., Victoria	Beaver	Yale Dist.
Beaverdell Wellington Syndicate Ltd	Greenwood, B.C	Wellington	Beaverdell
Henderson, T. T	Beaverdell, B.C	Duncan	Wallace Mt.
Highland Lass Ltd	Box 782 Kelowna, B.C	Highland Lass	Beaverdell.
McIntosh and Lee	Beaverdell	Ball	Wallace Mt.
Providence Mine Leasing Co., Ltd	Mullan, Idaho	Providence	Yale Dist.
Sally Mines Ltd	Penticton	Sally	Wallace Mt.
Spencer-Stanhope, P. B	Stone Newton Abbot, South Devon., Eng.	Bounty	Wallace Mt.
*Wellington Mines Ltd	205 Standard Stock Exchange Bldg., Spokane, Wash.	Wellington	Retallack.
White, Geo	Box 520, Greenwood	Elkhorn	Greenwood.
Kamloops Mining Division—			
*Cotton Belt Mines Ltd	736 Granville St., Vancouver	Meadow View	Similkameen.
Planet Mines and Reduction Co., Ltd.	402 Pender St. W., Vancouver.	Planet	Nicola.
*Smuggler Hill Development Co., Ltd.	Box 383, Kamloops	Smuggler	Birch Island.
Lardeau Mining Division—			
Teddy Glacier Mines Ltd	804 Standard Bank Bldg., Vancouver.	Teddy Glacier	Camborne.
Multiplex Mining, Milling & Power Co.	Camborne, B.C	Spider	Camborne.
Lillooet Mining Division—			
*Mineral Mountain Mines Ltd	612 Metropolitan Bldg., Vancouver.	Mineral Mt	Anderson Lake.
Nanaimo Mining Division—			
*Monton Woolsey Cons. Mines Ltd	413 Granville St., Vancouver	Dorothy Monton	Phillips Arm.

Silver-Lead-Zinc Mining Industry—Continued

Name	Address	Name of Mine	Location
BRITISH COLUMBIA—*Continued*			
Nass River Mining Division—			
Silver Crest Mines Ltd.	Commerce Bldg., Vancouver.	Silver Crest	Hastings Arm.
*Utility Mines Ltd.	470 Granville St., Vancouver.	Tiger	Alice Arm.
Nelson Mining Division—			
*Boundary Basin Mines Ltd.	1201 Vancouver Block, Vancouver.	Red Bird	Waneta.
Consolidated Mining and Smelting Co., Ltd.	Trail	Hunter V.	Ymir.
Goodenough Mine	Ymir	Goodenough	W. Kootenay.
*Howard Mine Ltd.	Ymir	Howard	Porcupine Creek.
*Reeves MacDonald Mines Ltd.	614 Stock Exchange Bldg., Vancouver.	Reeves McDonald	Salmo.
*Yankee Girl Consolidated Mines, Ltd.	35 Commerce Bldg., Vancouver.	Yankee Girl Enterprise	Ymir.
Young, G. A. & J. E. Hayden	Creston, B.C.	Delaware	Kootenay.
Omineca Mining Division—			
Babine Bonanza Mining & Milling Co., Ltd.	Bank of Nova Scotia Bldg., Vancouver.	Babine Bonanza	Smithers.
*Consolidated Mining and Smelting Co., Ltd.	Trail	Emerald	Omineca.
*Consolidated Mining and Smelting Co., Ltd.	Trail	Lucky Jim	Omineca.
Duthie Mines Ltd.	612 Pacific Bldg., Vancouver.	Duthie	Smithers.
*Ingenika Mines Ltd.	506 Pacific Bldg., Vancouver.	Ingenika	Ingenika River.
*Silver Island Mining Co., Ltd.	543 Granville St., Vancouver	Silver Island	Babine Lake.
Osoyoos Mining Division—			
B. E. Mining Co.	Leavenworth, Wash.	Oro Fine	Oliver.
Portland Canal Mining Division—			
*Atlas Gold and Copper Mines Co., Ltd.	700 Hall Bldg., Vancouver	Atlas	Cassiar
*Bitter Creek Mines Ltd.	Stewart	Bitter Creek	
Black Hill Mining Co., Ltd.	Stewart	Black Hill	
*Buena Vista Mining Co.	Trail	Big Missouri	Stewart.
*Comstock of B.C., Ltd.	1659 Stuart Bldg., Seattle, Wash.	Comstock	Merritt.
Mayou Gold Copper Co., Ltd.	700 Hall Bldg., Vancouver	Mayou	Bitter Creek.
Melvin Mining Co., Ltd.	Stewart	Melvin	
*Porter Idaho Mines Co., Ltd.	London Bldg., Vancouver	Porter Idaho	Marmot River.
*Premier Border Gold Mining Co., Ltd.	313 Crown Bldg., Vancouver.	Premier Border	Stewart.
*Silver Tip Mining Development Co., Ltd.	323 Sayward Bldg., Victoria	Silver Tip	Salmon River.
*Silverado Consolidated, Ltd.	London Bldg., Vancouver	Silverado	
*United Empire Gold & Silver Mining Co.	214 Standard Bank Bldg., Vancouver.	United Empire	Bear River.
Woodbine Gold Mining Co., Ltd.	701 Pacific Bldg., Vancouver.	Woodbine	Stewart.
Queen Charlotte Islands Mining Division—			
*Kitsault-Eagle Silver Mines Ltd.	312 Standard Bank Bldg., Vancouver.	Eagle Sunrise	Alice Arm, Q.C. Islands.
Revelstoke Mining Division—			
*Lardeau Mines Exploration Ltd.	410 Seymour St., Vancouver		Lardeau.
*Regal Silver Mines Ltd.	804 Standard Bank Bldg., Vancouver.	Regal	
Snowflake Mining Co., Ltd.	418 Standard Bank Bldg., Vancouver.	Snowflake	Albert Canyon.
*Wigwam Mining Co.	1217 Pacific Ave., Tacoma, Wash., U.S.A.	Wigwam	
Skeena Mining Division—			
*Britannia Mining and Smelting Co., Ltd.	Britannia Beach	Tonie Mine	Alice Arm.
Slocan Mining Division—			
Ainslee, Ray F.	Silverton, B.C.	Westmount	Slocan City.
American Boy Mining Co.	Box 171, Sandon	Slocan-Sovereign	Sandon.
Baldwin and Zachman	315 Paulsen Bldg., Spokane, Wash.	Mary Ryan	Sandon.
Blue Bird Mines, Ltd.	Kaslo	Blue Bird	Retallack.
Campbell, Colin J.	New Denver	Bosun	New Denver.
Canadian-Brandon	Sandon	Canadian-Brandon	Sandon.
Cechelero, John and Partners	New Denver	Mt. Chief Mammoth	New Denver.
Colonial Slocan Mines Ltd.	806 Vancouver Block, Vancouver.	Colonial	
Consolidated Queen Bess Mines Ltd.	Alamo	Queen Bess	Alamo.
Conk-Province Mines Ltd.	Kaslo	Conk-Province	Nashton.
Cunningham Mines Ltd.	Alamo	Alamo Mill	Alamo.
Erupec Mining Co.	708 Yorkshire Bldg., Vancouver.	Two Friends	Springer Creek.
Galena Farm Consolidated Mines Ltd.	614 Stock Exchange Bldg., Vancouver.	Hewitt, Galena Farm	
Galena Farm Mine Ltd.	Silverton	Galena Farm	Silverton.
Gormley, G. T.	Alamo	Monitor	Three Forks.
Helenita Mines Ltd.	826 Centre St., Calgary, Alta.	Helenita	
Jarvis, A.	Silverton	Standard	Silverton.
*Krao Mines Ltd.	Kaslo	Krao	Ainsworth.
*Leadsmith Mines Ltd.	Box 214, Spokane, Wash.	Noonday	Sandon.
Lucky Jim	614 Stock Exchange Bldg., Vancouver.	Lucky Jim	

Silver-Lead-Zinc Mining Industry—Concluded

Name	Address	Name of Mine	Location
BRITISH COLUMBIA—*Concluded*			
Lucky Thought Mines	Silverton	Lucky Thought	4 Mile Creek.
Minnesota Silver Co., Ltd	420 Lexington Ave., New York N.Y.	Ivanhoe	Sandon.
Molly Hughes Mines Ltd	318 Division St., Spokane	Molly Hughes	New Denver.
Noble Fine Mines Ltd	Nelson	Noble Fine Surprise	Sandon.
Paulsen and Porter	Sandon	Black Colt	
Petty, Geo. A	Sandon	Victor	Sandon.
Ruth-Hope Mining Co., Ltd	614 Stock Exchange Bldg., Vancouver.	Ruth-Hope	Sandon.
*Silver Dollar Mines	Salmo	Silver Dollar	Salmo.
*Silversmith Mines Ltd	Sandon	Silversmith	Sandon.
Slocan Rambler Mining Co., Ltd	35 Commerce Bldg., Vancouver.	Slocan Rambler	New Denver.
Slocan Silver Mines Ltd	Alamo	McAllister	Three Forks.
*Standard Silver Lead Mining Co	Silverton	Wonderful	
*Utica Mines Ltd	35 Commerce Bldg., Vancouver.	Utica	Keen.
*Van Roi Mines Ltd	Alamo	Van Roi	4 Mile Creek.
Victoria Syndicate, Ltd	614 Stock Exchange Bldg., Vancouver.	Hewitt Mill	
Western Exploration Co., Ltd	Silverton	Standard Mammoth	Silverton.
White, Oscar V	New Denver	Wakefield	4 Mile Creek.
Whitewater Mines Ltd	Kaslo	Whitewater	Retallack.
Trail Creek Mining Division—			
Cullinane and Moline	Rossland	I.X.L	O.K. Mountain.
Hackney Rose Hannah	Box 696 Rossland	Mayflower	Trail Creek.
Trout Lake Mining Division—			
*Spyglass-McLeod Mining Co., Ltd	210 Pemberton Bldg., Victoria	Spyglass	Poplar Creek.
Windermere Mining Division—			
Paradise Holdings, Ltd	614 Stock Exchange Bldg., Vancouver.	Paradise	Invermore.
YUKON			
Bjornes and Gordon	Keno Yukon Terr	Eureka	Sourdough Hill.
Keno Hill Ltd	120 Broadway, New York, N.Y.	Keno Hill	Mayo.
McKay, McIver, Forms and McIntosh	Keno Hill, Y.T	Shamrock	Keno Hill.
Treadwell Yukon Company, Ltd	Wernecke, Y.T	Wernecke	Mayo.

Tungsten Mining Industry

NOVA SCOTIA			
*Indian Path Gold Prospecting Syndicate.	464 Barrington St., Halifax	Indian Path	Lunenburg Co.

NON-METAL MINING INDUSTRIES INCLUDING FUELS

FUELS

Coal Mining Industry

Name	Address	Location
NOVA SCOTIA—		*District*
Acadia Coal Co., Ltd	Stellarton	Pictou.
Boston Coal Co	River Hebert	Cumberland.
Bras d'Or Coal Co	Little Bras d'Or Bridge	Cape Breton.
Burke, Chas. (formerly Burke, Herbert & White)	Joggins Mines	Cumberland.
Cumberland Railway and Coal Co	Springhill	Cumberland.
Dominion Coal Co., Ltd	Glace Bay	Cape Breton.
Enterprise Coal Co., Ltd. (formerly Lawson Coal Co.)	Amherst	Cumberland.
Greenwood Coal Co., Ltd	New Glasgow	Pictou.
Indian Cove Coal Co., Ltd	Sydney Mines	Cape Breton.
Intercolonial Coal Mining Co., Ltd	Westville	Pictou.
Inverness Railway and Coal Co	Inverness	Inverness.
Maritime Coal, Railway and Power Co., Ltd	Joggins Mines	Cumberland.
Nova Scotia Steel and Coal Co	Sydney Mines	Cape Breton.
River Hebert Coal Coal	River Hebert	Cumberland.
Standard Coal Co., (formerly Emerson Coal Co., Ltd.)	River Hebert	Cumberland.
Victoria Coal Co., Ltd., (operating No. 2 Mine, Minudie Coal Co.)	New Glasgow	Cumberland.
NEW BRUNSWICK—		
Avon Coal Co., Ltd	St. John	Queens.
Chipman Coal Co. (formerly Burpee Construction Co.)	Chipman	Queens.
Evans, W. B	Minto	Queens.
Minto Coal Co., Ltd	St. John	Queens.
Miramichi Lumber Co., Ltd	Minto	Queens.
Welton, Harvey	Minto	Queens.
Welton and Henderson	Minto	Queens.
SASKATCHEWAN—		*Municipality*
Bienfait Commercial Co	Bienfait	Near Bienfait.
Bienfait Mine	Bienfait	Near Bienfait.
Big Lump Coal Co	Estevan	Near Estevan.
Bourgouin, Louis	Estevan, Box 287	Near Estevan.
Crescent Collieries, Ltd	Bienfait	Near Bienfait.
Eastern Collieries of Bienfait, Ltd	Estevan	Near Estevan.
International Clay Products, Ltd	Estevan	Near Estevan.
Manitoba and Saskatchewun Coal Co., Ltd	503 Avenue Block, Winnipeg, Man	Bienfait.
Nicholson, H	Estevan	Estevan.
Parkinson, Geo	Estevan	Near Estevan.
Rollinson, W. H	Estevan	Estevan.
Shand Coal and Brick Co	Shand	Shand.
Western Dominion Collieries, Ltd	305 Trust and Loan Bldg., Winnipeg, Man	Taylorton.
ALBERTA—		*District*
Bituminous—		
Blue Diamond Coal Co., Ltd	Brulé Mines	Brulé.
Brazeau Collieries, Ltd	Nordegg	Nordegg.
Cadomin Coal Co., Ltd	Cadomin	Mountain Park.
Canmore Coal Co., Ltd	Canmore	Cascade.
Cartwright & Thomason (formerly Sunburst Coal Co.)	Blairmore	Crowsnest.
Hillcrest Collieries, Ltd	Hillcrest	Crowsnest.
International Coal and Coke Co., Ltd	Coleman	Crowsnest.
Luscar Collieries, Ltd	Edmonton	Mountain Park.
McGillivray Creek Coal and Coke Co., Ltd	Coleman	Crowsnest.
Mohawk Bituminous Mines, Ltd	Calgary	Crowsnest.
Mountain Park Collieries, Ltd	410 Tegler Bldg., Edmonton	Mountain Park.
West Canadian Collieries, Ltd	Blairmore	Crowsnest.
Sub Bituminous—		
Alexo Coal Co., Ltd	Alexo	Saunders.
Bighorn and Saunders Creek Collieries, Ltd	Saunders	Saunders.
Bryan Coal Co., Ltd	Adams Bldg., Edmonton	Coalspur.
Coalspur Collieries, Ltd	Coalspur	Coalspur.
Coal Valley Mining Co., Ltd	Coal Valley	Coalspur.
Confederation Coal Co., Ltd. (formerly Northern Alberta Mines, Ltd.)	Covell	Coalspur.
Foothills Collieries, Ltd	Foothills	Coalspur.
Jasper Coal Co., Ltd	Edmonton	Prairie Creek.
Lakeside Coal Co., Ltd. (formerly Balkan Coal Co., Ltd.)	Edmonton	Coalspur.
McLeod River Collieries (formerly Saunders Ridge Coal Co., Ltd.)	Mercoal	Coalspur.
Sterling Collieries Ltd	Edmonton	Coalspur.
Superva Coal Co., Ltd	Lorett	Coalspur.
Lignite—		
Alberta Block Coal Co., Ltd	Drumheller	Drumheller.
Albion Coal Co., Ltd	Calgary	Drumheller.
Arcadia Coal Co	Calgary	Drumheller.
Atlas Coal Co., Ltd	East Coulée	Drumheller.
Big Valley Collieries, Ltd	Big Valley	Big Valley.

Coal Mining Industry—Continued

Name	Address	Location
ALBERTA—*Concluded*		
Lignite—		
Bush Mines, Ltd	1024-101A Avenue, Edmonton	Edmonton.
Cadillac Coal Co., Ltd (formerly Donaldson, C. S. Coal Co.)	Suite 1, Hill Block, Lethbridge	Lethbridge.
Caledonian Collieries, Ltd	Drumheller	Drumheller.
Canadian Dinant Coal Co	Dinant	Camrose.
Canadian Pacific Railway Co	Department of Natural Resources, Calgary	Lethbridge.
Cardiff Coal Co	Cardiff	Edmonton.
City of Lethbridge Coal Mines	Lethbridge	Lethbridge.
Coal Producers, Ltd	Calgary	Pembina and Lethbridge.
Consolidated Diamond Collieries, Ltd	Lethbridge	Lethbridge.
Dawson Coal Co., Ltd	7 McDougall Court, Edmonton	Edmonton.
Dobell Coal Co., Ltd	Tofield	Tofield.
Drumheller Consolidated Collieries, Ltd	Calgary	Drumheller.
Eastern Alberta Coal Mines, Ltd	Edmonton	Tofield.
Elgin Coal Co., Ltd	Drumheller	Drumheller.
Ellis Coal Co., Ltd	Three Hills	Carbon.
Excelsior Collieries, Ltd	Wayne	Drumheller.
Fox Coal Co	Carbon	Carbon.
Fraser McKay Collieries, Ltd	10035—101st. St., Edmonton	Edmonton.
Great West Coal Co., Ltd. (Black Diamond Mine)	11026—101st St., Edmonton	Edmonton.
Great West Coal Co., Ltd (Star Mines)	Aerial	Drumheller.
Hy-Grade Coal Co	Drumheller	Drumheller.
Ideal Coal Co., Ltd	Wayne	Drumheller.
Jewel Collieries, Ltd	Wayne	Drumheller.
Keith and Fulton Coal Co., Ltd	Edmonton	Edmonton.
Lakeside Coals, Ltd	711 Tegler Bldg., Edmonton	Pembina.
Leblanc, Emile (formerly Bay Coal Co., Ltd.)	Taber	Taber.
Majestic Mines, Ltd. (formerly Leland Coal Co., Ltd.)	Taber	Taber.
Maple Leaf Minerals, Ltd	Drumheller	Drumheller.
Marcus Coal Mines, Ltd	10366—104th. St., Edmonton	Edmonton.
Midland Coal Mining Co., Ltd	Midlandvale	Drumheller.
Minute Mine	Drumheller	Drumheller.
Monogram Coal Co	Rosedale	Drumheller.
Murray Collieries, Ltd	Rosedale	Drumheller.
Newcastle Coal Co., Ltd	Drumheller	Drumheller.
Newcastle Junior Mining Co	Drumheller	Drumheller.
Oliphant, J. H	120-7th St., Medicine Hat & Carbon	Carbon and Redcliff.
Ontalta Collieries, Ltd	Rosedale Station, Drumheller	Drumheller.
Ottewell Coal Co	Clover Bar	Edmonton.
Palisade Coal Co., Ltd. (formerly Palisade Collieries, Ltd.)	Three Hills	Carbon.
Parker, L. (formerly Sun Coal Co., Ltd.)	Cardiff	Edmonton.
Peerless Carbon Colleries, Ltd	Carbon	Carbon.
Penn Mine Coal Co., Ltd	10651-92nd St., Edmonton	Edmonton.
Penn Mines, Ltd. (formerly Edmonton Collieries, Ltd.)	Fraser Flats, Edmonton	Edmonton.
Premier Coal Co., Ltd	109th Avenue, Edmonton	Edmonton.
Rabbit Hill Collieries, Ltd	Strathcona	Edmonton.
Redcliff Brick and Coal Co., Ltd	Redcliff	Redcliff.
Rosedale Coal Co., Ltd	Rosedale	Drumheller.
Rose Deer Coal Mining Co., Ltd	Wayne	Drumheller.
Royal Lethbridge Collieries	Box 5, Lethbridge	Lethbridge.
Shannon Coal Co., Ltd	Carbon	Carbon.
Sinoski, M	Stratheona	Edmonton.
Sovereign Coal Mining Co., Ltd. (formerly Western Commercial Co., Ltd.)	Wayne	Drumheller.
Stoney Creek Collieries, Ltd	Camrose	Camrose.
Sturgeon Valley Collieries, Ltd	Carbondale	Edmonton.
Sunbeam Coal Co., Ltd	Ardley	Ardley.
Superior Grade Coal Co., Ltd	Wayne	Drumheller.
Thomas, J. D., Coal Co	Nacmine	Drumheller.
Tofield Coal Co., Ltd	Tofield	Tofield.
Triangle Coal Co. (formerly Leech & Milne.)	Drumheller	Drumheller.
Warnebaldt, Julius	Sheerness	Sheerness.
Watson, W. (formerly Big Valley Power & Mining Co., Ltd.)	Big Valley	Big Valley.
Western Gem Coal Co., Ltd	Drumheller	Drumheller.
BRITISH COLUMBIA—		*District*
Blue Flame Colliery (Formerly Coalmont Collieries, Ltd.)	Coalmont	Inland.
Canadian Collieries (Dunsmuir) Ltd	Nanaimo	Island.
Chambers, R. H. (Little Ash Mine)	Nanaimo	Island.
Corbin Collieries, Ltd	Corbin	Crow's Nest Pass.
Crow's Nest Pass Coal Co., Ltd	Fernie	Crow's Nest Pass.
East Wellington Coal Co	Belmont House Victoria	Island.
Granby Consolidated Mining, Smelting and Power Co., Ltd	Cassidy	Island.
Lynden Coal Mines, Ltd	Princeton	Inland.
Middlesboro Collieries, Ltd	Merritt	Inland.
Pleasant Valley Mining Co., Ltd	Princeton	Inland.
Tulameen Coal Mines, Ltd	Princeton	Inland.
Western Fuel Corporation of Canada, Ltd	Nanaimo	Island.

Natural Gas Industry.

Name	Address	Location
NEW BRUNSWICK—		*Field*
New Brunswick Gas and Oilfields, Ltd.	Box 196, Moncton	Stoney Creek, Albert Co.
ONTARIO—		
Ajax Oil and Gas Co.	501 Federal Bldg., Toronto	Dover W.
Allen, J. D.	Lowbanks	Moulton.
Beer, Geo.	Binbrook	Binbrook.
Benn, A. S.	Hagersville	Walpole.
Binbrook Gas Co.	Binbrook	Binbrook.
Border Cities Syndicate	47 Elgin St., Brantford	Onondaga.
Canada Cement Co., Ltd.	Box 29, Montreal, Que.	Wainfleet.
Canboro Gas and Oil Co.	Selkirk	Canboro, Cayuga N. and Seneca.
Canby, B. F.	R. R. No. 2, Wainfleet	Wainfleet.
Canfield Natural Gas Co., Ltd.	Canfield	Cayuga N.
Central Pipe Line Co., Ltd.	Chatham	Bayham, Houghton, Middleton.
Chippewa Development Co., Ltd.	Chippewa	Willoughby.
Cliff Gas Co., Ltd.	Welland	Moulton, Canboro.
Coleman, J. A.	Wellandport	Wainfleet, Gainsboro.
Dominion Natural Gas Co., Ltd.	518 Jackson Bldg., Buffalo, N.Y., U.S.A.	Binbrook, Bayham, Canboro, Caistor, Charlotteville, Cayuga, N. Cayuga S., Dunn, Glanford, Houghton, Middleton, Malahide, Moulton, Onondaga, Oneida, Rainham, Seneca, Walpole, Walsingham S., Walsingham N., Windham, Woodhouse, Townend.
Dunn Natural Gas Co., Ltd.	Dunnville	Dunn and Sherbrooke.
Eastside Gas Co.	R.R. 2, Lowbanks	Sherbrooke.
Ellsworth, F.	Box 391, Pt. Colborne	Wainfleet.
Erie Gas and Oil Co.	Fisherville	Rainham.
Fisherville Gas Co.	Fisherville	Rainham.
Fisherville Gas Co., No. 2	Fisherville	Rainham.
Fletcher, J. D.	R.R. 1, Hannon	Binbrook.
Gifford, Arthur and Son	R.R. 2, Cayuga	S. Cayuga.
Haldimand Gas Fields Syndicate	Cayuga	Cayuga N.E., Rainham.
Hart and Harrington	Dunnville	Canboro.
Held, Fred	Fisherville	Rainham.
Hill, A. W.	Coatsworth	Tilbury E.
Hoffman, Albert	R.R. 2, Dunnville	Moulton.
Industrial Natural Gas Co., Ltd.	Thorold	Bertie, Crowland, Humberstone.
Jasperson, B.	Kingsville	Gosfield South and Tilbury E.
Jones, J. S.	Port Maitland	Dunn.
Kindy, D. and Son	Selkirk	Rainham.
Lincoln Gas Co., Ltd.	Grimsby	Gainsboro, Canboro, Caistor.
Medina Natural Gas Co., Ltd.	215 King St. W., Chatham	Bayham, Houghton and Middleton.
Michener, E. L.	Wainfleet	Wainfleet.
Midfield Natural Gas Co., Ltd.	421 King St. E., Hamilton	N. Cayuga and Oneida.
Nesbitt, O. L.	Dunnville	Moulton.
Nelles Corners Gas Syndicate	Nelles Corners	Cayuga N. and Rainham.
New Azoff Gas Co., Ltd.	Canboro	Cayuga N.
Niece Hosea and Son	R.R. 2, Lowbanks	Sherbrooke.
Northern Gas and Gasoline Co.	Hepworth	Anabel.
North Shore Gas Co., Ltd.	Selkirk	Rainham.
Oil Springs Oil and Gas Co., Ltd.	Oil Springs	Enniskillen.
Ontario Salt Co., Ltd.	Hamilton	Dorchester N.
Patterson, W. C.	Jamestown, N.Y., U.S.A.	Cayuga N., Cayuga S. and Dunn.
Petrol Oil and Gas Co., Ltd.	307 York Bldg., Toronto	Dover West and Tuscarora.
Port-Colborne-Welland Natural Gas and Oil Co., Ltd.	Port Colborne	Oneida, Onondaga and Seneca.
Provincial Natural Gas and Fuel Co., of Ontario, Ltd.	Niagara Falls	Bertie, Crowland, Humberstone and Willoughby.
Rainham Gas and Oil Syndicate	Fisherville	Rainham.
Sarnia Gas and Oil Co.	Sarnia	Sarnia.
Schram and Saunders	Welland	Moulton.
Seneca Gas Syndicate	Dunnville	Dunn and Seneca.
Smith, R. H.	Lowbanks	Moulton.
South Cayuga Gas Syndicate	R.R. 2, Cayuga	Cayuga S.
Southern Ontario Gas Co., Ltd.	518 Jackson Bldg., Buffalo, N.Y., U.S.A.	Mersea, Raleigh, Romeny and Tilbury East.
South Sarnia Properties, Ltd.	Sarnia	Sarnia.
Springvale Gas and Oil Co., Ltd.	Hagersville	Walpole.
Sterling Gas Co., Ltd.	Port Colborne	Humberstone, Moulton, Sherbrooke and Wainfleet.
Stevensville Natural Gas and Fuel Co.	Stevensville	Bertie.
Stoney Creek Gas Syndicate	Selkirk	Rainham.
Sundy Gas Well Co.	Dunnville	Canboro.
Union Natural Gas Co. of Canada, Ltd.	52 Fifth St., Chatham	Tilbury E., Romney, Raleigh, Dover, Dawn, Euphemia.
United Gas Companies, Ltd.	518 Jackson Bldg., Buffalo, N.Y., U.S.A.	Canboro, Cayuga N., Moulton, Seneca, Wainfleet.
Vacuum Gas and Oil Co., Ltd.	701 Federal Bldg., Toronto	Middleton.
Van Sickle, A. W.	Onondaga	Onondaga.
Wainfleet-Moulton Gas Co.	R.R. 1, Lowbanks	Moulton and Wainfleet.

Natural Gas Industry—Concluded

Name	Address	Location
MANITOBA—		
Bosc, Francois	Rathwell	Rathwell.
Clement, F.	Waskada	Waskada.
Haskill, E. C.	Box 64, Treherne	Treherne.
ALBERTA—		
Alberta Clay Products Co., Ltd.	Box 672, Medicine Hat	Medicine Hat.
Associated Oil and Gas Co., Ltd.	606-2nd St. W., Calgary	Turner Valley.
Bow Island Gas Plant	Bow Island	Bow Island.
Canada Cement Co., Ltd.	Canada Cement Co., Bldg., Montreal, P.Q.	Medicine Hat.
Canadian Pacific Railway Co.	Montreal, P.Q.	Medicine Hat.
Canadian Western Natural Gas, Light, Heat and Power Co., Ltd.	215-6th Ave. W., Calgary	Bow Island, Brooks, Barnwell, Foremost and Turner Valley.
Canadian Western Power and Fuel Co., Ltd.	Redcliff	Redcliff.
Dalhousie Oil Co., Ltd.	606-2nd St. W., Calgary	Turner Valley.
Dominion Glass Co., Ltd.	1111 Beaver Hall Hill, Montreal, P.Q.	Redcliff.
Foothills Oil and Gas Co., Ltd.	606-2nd St. W., Calgary	Turner Valley.
Gypsy Oil, Ltd.	636 Tegler Bldg., Edmonton	Wainwright.
Higgins, Estate of	Suffield	Suffield.
Home Oil Co.	606-2nd St. W., Calgary	Turner Valley.
Hudson's Bay Oil and Gas Co., Ltd.	407 Herald Bldg., Calgary	Viking.
Illinois-Alberta Oils, Ltd.	211 Lancaster Bldg., Calgary	Turner Valley.
Maple Leaf Oil Co., Ltd.	1007 Stock Exchange Bldg., Vancouver, B.C.	Wainwright.
Maple Leaf Milling Co., Ltd.	Toronto, Ont.	Medicine Hat.
McLeod Oil Co., Ltd.	507 Grain Exchange, Calgary	Turner Valley.
Medicine Hat Brick and Tile Co., Ltd.	Medicine Hat	Medicine Hat.
Medicine Hat, Corporation of	Medicine Hat	Medicine Hat.
New McDougall-Segur Oil Co., Ltd.	38 Union Bldg., Calgary	Turner Valley.
Northwestern Utilities, Ltd.	10305 Jasper Ave., Edmonton	Viking.
Ogilvie Flour Mills Co., Ltd.	Montreal, P.Q.	Medicine Hat.
Ontario-Alberta Oil Development Co.	56 Imperial Bank Bldg., Toronto	Suffield.
Redcliff Brick and Coal Co., Ltd.	Box B 5, Redcliff	Redcliff.
Royalite Oil Co., Ltd.	606-2nd St. W., Calgary	Turner Valley.
Spooner Oils, Ltd.	Bank of Commerce Chambers, Calgary	Turner Valley.
United Electric and Engineering Co., Ltd.	721—11th St. W., Calgary	Bassano.
United Natural Gas Development Co., Ltd.	200-203 Leeson-Lineham Bldg., Calgary.	Foremost.
Wainwell Oils, Ltd.	114 Union Trust Bldg., Toronto, Ont.	Wainwright.
Wetaskiwin, Corporation of	Wetaskiwin	Wetaskiwin.
Wainwright Gas Co., Ltd.	36 Dominion Bank Bldg., Edmonton	(Distributing Company).

Petroleum Industry

		Field
NEW BRUNSWICK		
New Brunswick Gas and Oilfields, Ltd.	Box 196, Moncton	Stoney Creek, Albert Co.
ONTARIO—		
Ajax Oil and Gas Co., Ltd.	85 Richmond St. W., Toronto	Thamesville.
Anderson Bros. and Thompson	Oil Springs	Oil Springs.
Anderson, J. H.	Oil Springs	Oil Springs.
Armstrong, J. E.	Petrolia	Enniskillen.
Atkinson, John	R.R. 3, Petrolia	Enniskillen.
Atkinson, Wm.	R.R. 3, Petrolia	Plympton.
Bailey, John	Petrolia	Moore.
Baker, Jas.	R.R. 3, Petrolia	Enniskillen.
Barrett, C. H.	Petrolia	Enniskillen.
Bernelle, Thos.	Petrolia	Moore.
Bowles, Herbert	Petrolia	Sarnia.
Bradley, R. N.	Lowbanks	Enniskillen.
Brock, T. A.	Petrolia	Enniskillen.
Brown, W. J.		Moore.
Bruce, A.	Oil	Moore.
Byers, Lydia	Oil Springs	Oil Springs.
Canada Crude Oil Producers, Ltd.	Petrolia	Petrolia.
Canadian Oil Refineries Co., Ltd.	200 Bay St., Toronto	Petrolia and Enniskillen.
Carleton, W. G.	R.R. 2, Petrolia	Enniskillen.
Carman and Fairbank	Petrolia	Bothwell.
Chesher, Geo.	Petrolia	Sarnia.
Colchester Oil Co.	Toronto	Thamesville.
Collins, Thos.	Petrolia	Petrolia.
Copeland, John	Petrolia	Enniskillen.
Coulter, James	R.R. 3, Petrolia	Moore.
Crocker-Parks Oil Co., Ltd.	Oil Springs	
Crotty and Elliot	Bothwell	Bothwell.
Deacon, F. W.	Petrolia	Petrolia.
Dennis, C.	Oil Springs	Oil Springs.
Dennis, E.	Petrolia	Plympton.
Dominion Petroleums Co., Ltd.	Glencoe	Mosa.

Petroleum Industry—Continued

Name	Address	Location
ONTARIO—*Continued*		
Donald, Geo	Oil Springs	Oil Springs.
Drope, Geo	R.R. 4, Copelston	Enniskillen.
Duncan Bros	R.R. 3, Petrolia	Moore.
Edward, F. H	Box 125, Petrolia	Enniskillen.
Elliot, C. H	Corunna	Sarnia.
Elliot, K. G	R.R. 2, Sarnia	Enniskillen.
Elliot, Henry	Petrolia	Moore.
Ewart, Jas	R.R. 1, Wyoming	Plympton.
Fairbank, C. O., Estate	Petrolia	Oil Springs.
Fairbank, J. H., Estate	Petrolia	Oil Springs.
Font, A	Petrolia	Moore.
Forsythe, A	Copelston	Petrolia and Enniskillen.
Gillespie, Wm	Petrolia	Petrolia.
Goudie, John	Petrolia	Enniskillen.
Gregory, Henry	Petrolia	Enniskillen.
Griffin, Geo. B	R.R. 1, Sarnia	Sarnia.
Halliday, Henry	R.R. 2, Sarnia	Sarnia.
Hamlin, F. G	Petrolia	Petrolia.
Hardy, Chas	R.R. 2, Sarnia	Sarnia.
Hastie, Wm	R.R. 2, Sarnia	Sarnia.
Heal, John	Petrolia	Moore.
Hillis, T. J. and Sons	Oil Springs	Oil Springs.
Houston, Mrs. Annie	Petrolia	Petrolia.
Howlett, Fred	Petrolia	Petrolia.
Jewell, Dan	Oil Springs	Oil Springs.
Johns, Wm	Wyoming	Plympton.
Josh, Thos		Enniskillen.
Kelly, J. F	Box 706, Petrolia	Petrolia and Enniskillen.
Kerr, John, Estate	Petrolia	Petrolia and Enniskillen.
Kerr, Mrs. Ross	Sarnia	Enniskillen.
Kettle, Robt	Petrolia	Enniskillen.
Kirk, Elmer	Petrolia	Moore.
Lammy, H	R.R. 3, Petrolia	Petrolia and Enniskillen.
Levine, H	Petrolia	Petrolia and Enniskillen.
Levitt, C	Wyoming	Plympton.
Lewis, J. J., Estate	Oil Springs	Oil Springs.
Lidster, Geo. H	Dunwich	
Logan, Herbert	Petrolia	Petrolia and Enniskillen.
Logan, Leslie	R.R. 3, Petrolia	Petrolia and Enniskillen.
Loxton, Thos	Petrolia	Petrolia and Enniskillen.
Maw, F. W	Petrolia	Petrolia and Enniskillen.
McAlpine	R.R. 3, Petrolia	Petrolia and Enniskillen.
McColl, Ed	Petrolia	Petrolia and Enniskillen.
McGuffey, Richard	Bothwell	Bothwell.
McGillivray, Geo. A	201 Mt. Pleasant Ave., London	Oil Springs.
McKay, John	Sarnia	Sarnia.
McLean, L	Newbury	Bothwell.
McLellan, Walter	R.R.3, Petrolia	Moore.
McManus, Alex	Wyoming	Plympton.
McNaughton, J. D	R.R. 2, Newbury	Mosa.
McRitchie, C. A	Bothwell	Bothwell.
Mitchell, Charles	Oil Springs	Oil Springs.
Mitchell, Wesley	Sarnia	Sarnia.
Miller, F. J	R.R. 2, Sarnia	Sarnia.
Miller, W. W	R.R. 3, Petrolia	Moore.
Mills, A. J	Corunna	Sarnia.
Morningstar and Jackson	Oil Springs	Oil Springs.
Morningstar, L. H	Oil Springs	Oil Springs.
Morris, Geo	Petrolia	Petrolia and Enniskillen.
Mott, Ed. J	Oil Springs	Oil Springs.
Mott and Mitchell	Oil Springs	Oil Springs.
Mutual Oil Producing Co	195 Dundas St., London	Petrolia.
Napper, Fred	Petrolia	Petrolia and Enniskillen.
Ontario Lands and Oil Co., Ltd	Petrolia	Petrolia and Enniskillen.
Owens, R. H	Petrolia	Petrolia and Enniskillen.
Parks, Mrs. E. M	R.R. 3, Petrolia	Petrolia and Enniskillen.
Portsmouth, T	Petrolia	Petrolia and Enniskillen.
Petrol Oil and Gas Co., Ltd	307 York Bldg., Toronto	Dover W.
Rainsberry, N. J	Petrolia	Sarnia.
Rainsberry, Walter	Petrolia	Petrolia and Enniskillen.
Rawson, A	Petrolia	Petrolia and Enniskillen.
Rawson, Wallace	R.R. 3, Petrolia	Petrolia and Enniskillen.
Redick, W. O	R.R. 3, Petrolia	Plympton.
Richardson, Geo	Wyoming	Plympton.
Ruckle, H	Petrolia	Sarnia.
Schumacher, Bowen E	112 Adams St., Chicago, Ill., U.S.A.	Petrolia and Enniskillen.
Smith, T. E	R.R. 2, Sarnia	Sarnia.
Sproule, Bros	Oil Springs	Oil Springs.
Stevenson, G. L	Petrolia	Petrolia and Enniskillen.
Stonehouse Bros	Petrolia	Moore.
Summit Oil Co	610 Union Trust Bldg., Rochester, N.Y., U.S.A.	Bothwell.
Tuer, J. T	Wyoming	Plympton.
Vulcan Gas and Oil Co	85 Richmond St., Toronto	Thamesville.
Walker Oil and Gas Co., Ltd	120 Chatham St. W., Windsor	Dolyford.
Walker, Alex C	Oil Springs	Oil Springs.

Petroleum Industry—Continued

Name	Address	Location
ONTARIO—*Concluded*		
Wallen, John, Estate	Oil Springs	Oil Springs.
Wallen and Wallen, Estate	Oil Springs	Oil Springs.
Walsh, T	Petrolia	Petrolia and Enniskillen.
Warwick, Joseph	Oil Springs	Oil Springs.
Watt, R. J	London	Petrolia and Enniskillen.
Willits, Geo. E	Bothwell	Bothwell.
Winnett, J. W. G	Bothwell	Bothwell.
Woodward, John	Oil Springs	Oil Springs.
Woodward, Wm	Oil Sprngs	Oil Springs.
Yerkes, Carl	Petrolia	Petrolia and Enniskillen.
Young, W. E	Wyoming	Plympton.
SASKATCHEWAN—		
Drilling—		
Citizens Oil & Gas Co., Ltd	Saskatoon	Unity Valley.
Pike Lake Oil & Gas Development and Exploration Co., Ltd	Saskatoon	Pike Lake.
Rosetown Leaseholding & Development Co., Ltd	Rosetown	Mountain View.
Simpson Oil Co., Ltd	Simpson	Simpson.
Unity Valley Oil Co., Ltd	207 Lancaster Bldg., Calgary, Alta	Unity Valley.
ALBERTA—		
Producing—		
Associated Oil & Gas Co., Ltd	606—2nd St. W., Calgary	Turner Valley.
British Dominion Oil & Development Corporation, Ltd	211 Dominion Bank Bldg., Calgary	Turner Valley.
Calmont Oils, Ltd	400 Lancaster Bldg., Calgary	
Dalhousie Oil Co	606—2nd St. W., Calgary	Turner Valley.
Foothills Oil & Gas Co., Ltd	606—2nd St. W., Calgary	Turner Valley.
Gypsy Oils, Ltd	636 Tegler Bldg., Edmonton	Wainwright.
Home Oil Co., Ltd	535 Georgia St., Vancouver, B.C	Turner Valley.
Illinois-Alberta Oils, Ltd	211 Lancaster Bldg., Calgary	Turner Valley.
McLeod Oil Co., Ltd	507 Grain Exchange, Calgary	Turner Valley.
New McDougall-Segur Oil Co., Ltd	38 Union Bldg., Calgary	Turner Valley.
Okalta Oils, Ltd	1015 Herald Bldg., Calgary	Turner Valley.
Ribstone Oils, Ltd	914 Lancaster Bldg., Calgary	Ribstone.
Royalite Oil Co., Ltd	606—2nd St. W., Calgary	Turner Valley.
Sasko-Wainwright Oil & Gas Co., Ltd	713 Canada Life Bldg., Saskatoon, Sask	Wainwright.
Sioux City Oils, Ltd	410 Maclean Block, Calgary	Turner Valley.
Spooner Oils, Ltd	Bank of Commerce Chambers, Calgary	Turner Valley.
United Oils, Ltd	200-203 Leeson-Lineham Block, Calgary	Turner Valley.
Vulcan Oils, Ltd	Vulcan	Turner Valley.
Wainwell Oils, Ltd	114 Union Trust Bldg., Toronto, Ont.	Wainwright.
Drilling only—		
Admiral Oils Ltd	37 Canada Life Bldg., Calgary	Wainwright.
Advance Oil Co., Ltd	522 P. Burns Bldg., Calgary	Turner Valley.
Alberta Gas and Fuel Co., Ltd	Pincher Creek	Champion.
Anaconda	202 Traders Bldg., Calgary	Turner Valley.
Angus Oils Ltd	522 P. Burns Bldg., Calgary	Waite Valley.
Baltac Oils Ltd	200-3 Leeson-Lineham Blk., Calgary	Turner Valley.
Banner Oils Ltd	312-313 Alberta Corner, Calgary	Sinclair-Highwood.
Beaumont Oils Ltd	Brandon, Man	Wainwright.
Bethwain Oils Ltd	23 Toronto St., Toronto, Ont	Wainwright.
Bugle Oils Ltd	51 Standard Bank Bldg., Winnipeg, Man	Milk River.
Calgary Development & Producers, Ltd	606—2nd St. W., Calgary	Waite Valley.
Commonwealth Petroleum Ltd	410 Lancaster Bldg., Calgary	Blood Indian Reserve, Milk River and Turner Valley.
Dalfin Petroleum Ltd	411 Lancaster Bldg., Calgary	Turner Valley.
Dauntless Oils Ltd	300 Leeson-Lineham Blk., Calgary	Skiff.
Devenish Petroleum Ltd	300 Leeson-Lineham Blk., Calgary	Skiff.
Dome Oils, Ltd	200-3 Leeson-Lineham Blk., Calgary	Turner Valley.
Duluth Syndicate	Calgary	Kinsella.
Dutch America Oils Ltd	303 Maclean Block, Calgary	Turner Valley.
Eagle Butte Oil Co., Ltd	Medicine Hat	Cypress Hills.
East Crest Oil Co., Ltd	Niagara Falls, Ont	Turner Valley.
Edalta Oils, Ltd	Wainwright	Wainwright.
Elbow Oil Co., Ltd	25 Michael Bldg., Calgary	Moose Mountain.
Fabyan Petroleums Ltd	820 Stock Exchange Bldg., Vancouver, B.C	Wainwright.
Freehold Oil Corp., Ltd	803 Lancaster Bldg., Calgary	Turner Valley.
Freeman & Lundy	107—6th Ave., Calgary	Turner Valley.
Frontier Developments Ltd	Bank of Commerce Bldg., Edmonton	Wildcat Hills.
Fuego Oil Co., Ltd	Oyen	Fuego.
Globe Drilling Co., Ltd	10012—101a Ave., Edmonton	Pigeon Lake.
Herron Petroleum Ltd	507-8 Lancaster Bldg., Calgary	Bragg Creek.
High River Oilfields, Ltd	310 Leeson-Lineham Blk., Calgary	High River.
Highwood Petroleum & Natural Gas Co., Ltd	914 Lancaster Bldg., Calgary	Highwood.
Homestead Oils, Ltd	303 Beveridge Bldg., Calgary	Turner Valley.
Hylo Oils, Ltd	401 Maclean Block, Calgary	Turner Valley.
Indian Oils, Ltd	514 Maclean Block, Calgary	Rickert.
Invaders Petroleum Ltd	225A—8th Ave. W., Calgary	Turner Valley.
Kamorley Oils Ltd	Godman Bldg., Kamloops, B.C	Morley.

Petroleum Industry—Concluded

Name	Address	Location
ALBERTA—*Concluded*		
Drilling only—Concluded		
Lethbridge Petroleum & Refineries, Ltd	106 P. Burns Bldg., Calgary	Blood Indian.
Lowery Petroleums Ltd	902 Stock Exchange Bldg., Vancouver, B.C	Turner Valley.
Mayland Oil Co., Ltd	606—2nd Ave. W., Calgary	Turner Valley.
Mercury Oils, Ltd	300 Lancaster Bldg., Calgary	Turner Valley.
Merland Oil Co. of Canada, Ltd	35 Commerce Bldg., Vancouver, B.C	Turner Vellay.
Mill City Petroleums, Ltd	229—8th Ave. W., Calgary	Turner Valley.
Miracle Oils, Ltd	300 Lancaster Bldg., Calgary	Turner Valley.
Model Oils, Ltd	Suite 7, Cameron Block, Calgary	Turner Valley.
Moose Oils, Ltd	Calgary	Moose Mountain.
Northwest Co., Ltd	606—2nd Ave. W., Calgary	Turner Valley.
Onalto Oils, Ltd	Wainwright	Wainwright.
Oxville Oil, Gas & Development Co., Ltd	Oxville	Ribstone.
Paramount Oils, Ltd	407 Grain Exchange Bldg., Calgary	Turner Valley.
Peninsular Petroleums Ltd	110 Adelaide St. W., Toronto, Ont	Wainwright.
Ranchmen's Gas & Oil Co., Ltd	509 Grain Exchange Bldg., Calgary	Aldersyde.
Range Oil and Gas Co., Ltd	914 Lancaster Bldg., Calgary	Border.
Ranger Oil Co., Ltd	410 Maclean Block, Calgary	Turner Valley.
Regent Oil Co., Ltd	Calgary	Turner Valley.
Richfield Petroleum, Ltd	225A—8th Ave. W., Calgary	Waite Valley.
Roselite Oils, Ltd	303 Beveridge Bldg., Calgary	Waite Valley.
Sarcee Oil & Development Co., Ltd	914 Lancaster Bldg., Calgary	Sarcee Reserve.
Sentinel Oils, Ltd	523 Lougheed Bldg., Calgary	Turner Valley.
Sinclair-Morley Oil Structures Syndicate, Ltd	604 Leeson-Lineham Blk., Calgary	Morley Reserve.
Southern Lowery Oils, Ltd	902 Stock Exchange Bldg., Vancouver, B.C	Turner Valley.
Southwest Petroleum Co., Ltd	801 Dominion Bank Bldg., Toronto, Ont	Turner Valley
Sterling Pacific Oil Co., Ltd	567 Burrard St., Vancouver, B.C	Turner Valley.
Structure Oil & Gas Co., Ltd	209 Lancaster Bldg., Calgary	Turner Valley.
Twin Dome Oil Co., Ltd	High River	Twin Dome.
Vanalta Oils, Ltd	511 Province Bldg., Vancouver, B.C	Red Coulee.
Vanberta Oils Ltd	412 Yorkshire Bldg., Vancouver	Turner Valley.
Vimy Oils Ltd	708 Centre St., Calgary	Turner Valley.
Wabash Oils Ltd	Calgary	Morley.
Wainwright Petroleums Ltd	Molsons Bank Bldg., Edmonton	Wainwright.
Warner Oils Ltd	531 Lougheed Bldg., Calgary	Highwood.
Wellington Oil & Gas Co., Ltd	200-203 Leeson-Lineham Block, Calgary	Turner Valley.
Western Alberta Oil Co., Ltd	232 Portage Ave., Winnipeg, Man	Highwood-Sinclair.
Weyman Petroleum Ltd	605-7 Lougheed Bldg., Calgary	New Black Diamond.
Widney Oils, Ltd	Calgary	Turner Vellay.

OTHER NON-METAL MINING INDUSTRIES

Actinolite Mining Industry

Name	Address	Location
ONTARIO—		
Actinolite Mining Co., Ltd	111 Beaver Hall Hill, Montreal, P.Q.	Elzevir, Tp.

Asbestos Mining Industry

Name	Address	*Mine*	*Township*
QUEBEC—			
Asbestos Corporation, Ltd	Canada Cement Co. Bldg., Montreal	Asbestos.	E. Broughton.
		Beaver.	Colerain.
		Boston.	Broughton.
		British Canadian.	Coleraine.
		Consolidated.	Thetford.
		King.	Thetford.
		Maple Leaf.	Coleraine.
		Vimy Ridge.	Ireland.
Bell Asbestos Mines Inc	Ambler, Pa., U.S.A	Bell.	Thetford.
Canada Asbestos and Chrome Co	Black Lake	Greenshield.	Coleraine.
Canadian Johns-Manville Co., Ltd	450 St. James St., Montreal	Jeffrey.	Shipton.
Johnson's Company	Thetford Mines	Johnson's.	Thetford.
		Johnson's.	Coleraine.
Northern Asbestos Co., Ltd	Thetford Mines.		Thetford.
Quebec Asbestos Corporation, Ltd	East Broughton	Quebec.	E. Broughton.

Barytes

Name	Address	Location
NOVA SCOTIA—		
Brandram-Henderson, Ltd	Box 190, Montreal, P.Q	East Lake Ainslie, Inverness Co.

Bituminous Sands

ALBERTA—		
Bituminous Sand Extraction Co., Ltd	507 McLean Block, Calgary	Fort McMurray District.
McMurray Asphaltum and Oil, Ltd	Petrolia, Ont	Fort McMurray District.

Diatomite

NOVA SCOTIA—		
Oxford Tripoli Sales, Inc	People's Bank Bldg., Harvestraw, N.Y., U.S.A	East New Annan.
BRITISH COLUMBIA—		
B.C. Refractories, Ltd	Ft. Smythe St., Vancouver	Quesnel.

Feldspar Mining Industry

ONTARIO—		
Bathurst Feldspar Mines, Ltd	230 King St. E., Toronto	Lanark County.
Craig, T. H	Box 300 Perth Ont	Lanark County.
Feldspar Quarries, Ltd	506 National Bldg., Toronto	Perth Area.
Frontenac Floor and Wall Tile Co., Ltd. Mill	Box 178, Kingston, Ont	
Genesee Feldspar Co., Inc	Hyhla, Ont	Verona, Hybla.
Hoey, D. H	Britt, Ont	
National Feldspar Co., Ltd	301 Royal Bank Bldg., Toronto	Lanark County.
Orser, S. H	Sydnoham, Ont	Perth Road, Ont.
Wanup Feldspar Mines, Ltd	Lucknow, Ont	Dill Tp.
QUEBEC—		
Brazeau, Maurice A	Buckingham, Que	Fasley Lake.
Bon Ami, Ltd	Drawer 166, Hochelaga, Montreal	Aylwin Tp.
Cameron, J. J	Box 11, Buckingham, Que	Buckingham West.
Donaldson, Robert J	Glen Almond, Que	Buckingham Dist.
O'Brien and Fowler, Ltd	Buckingham, Que	Derry Tp.
Parker, Alfred	Glen Almond, Que	Derry Tp.
Pedneaud, Gonzague	Buckingham, Que	
Whitfield, T	Buckingham, Que	
Whittemore, Mrs. A. R	475 Kent St., Ottawa, Ont	Derry Tp.
Winning, B	N.D. de la Salette, Que	Buckingham Tp.

Garnets

QUEBEC—		
Labelle Nickel and Garnet Co., Ltd	354 St. Catherine St. E., Montreal	July Tp.
Langlade Garnet Syndicate	132 rue St. Pierre, Quebec	Baudin Tp.
ONTARIO—		
Stockhauser, Chas. A	Madoc, Ont	Madoc Tp.
BRITISH COLUMBIA—		
Consolidated Mining and Smelting Co. of Canada, Ltd.	Trail, B.C	Grand Forks.

Graphite Mining Industry

ONTARIO—		
Black Donald Graphite Co., Ltd	Calabogie, Ont	Brougham Tp.
QUEBEC—		
Canadian Graphite Corp	Guenette, Que	Boyer Tp.

Grindstone Industry

Name	Address	Location
NOVA SCOTIA—		
Murphy Logan	Balmoral Mills	Waugho River.
NEW BRUNSWICK—		
Miramichi Quarry Co., Ltd	Quarryville, N.B	Quarryville.
Read Stone Co., Ltd	Stonehaven, N.B	Stonehaven.
BRITISH COLUMBIA—		
McDonald, J. A. and C. H	Vancouver	

Gypsum Mining Industry

NOVA SCOTIA—		
Atlantic Gypsum Products Co	40 Central St., Boston, Mass	Walton, Cheticamp.
Canadian Gypsum Co., Ltd	Windsor, N.S	Wentworth Creek.
Connecticut Adamant Plaster Co	Walton, N.S	Hants County
Iona Gypsum Products	Sydney, N.S	
North American Gypsum Co	Baddeck, N.S	Baddeck Bay.
Nova Scotia Coal and Gypsum Co., Ltd	Box 13, Mabou, N.S	Mabou Harbour.
Windsor Plaster Co., Ltd	Windsor, N.S	Windsor.
Windsor Gypsum Co	Box 727 Newburgh, N.Y	Newport Station.
NEW BRUNSWICK—		
Albert Manufacturing Co	511 Canada Cement Bldg., Montreal	Hillsborough.
Fraser, Donald	Plaster Rock, N.B	Plaster Rock.
ONTARIO—		
Canada Gypsum and Alabastine Ltd	Paris, Ont	Caledonia, Lythmore.
MANITOBA—		
Canada Gypsum and Alabastine Ltd	Box 3057 Winnipeg, Man	Gypsumville.
BRITISH COLUMBIA—		
Canada Cement Co., Ltd	Canada Cement Bldg., Montreal	Mayook.
Canada Gypsum and Alabastine, Ltd	509 Richards St., Vancouver	Falkland.

Iron Oxide Industry

QUEBEC—		
Argall, Thos. H	La Pointe du Lac, Que	
Canada Paint Co., Ltd	2875 Centre St., Montreal	Champlain Co.
Montmorency Paint Products Co., Ltd	1100 Craig St. E., Montreal	Beaupre, Que.
BRITISH COLUMBIA—		
Davidson, J. G	3498 Maurice Drive, Vancouver	Mons, B.C.

Magnesite Mining Industry

QUEBEC—		
International Magnesite Co., Ltd	Harrington East, Que	Harrington Tp.
Scottish Canadian Magnesite Co., Ltd	30 Halton Ave, Montreal	Grenville, Tp.

Manganese Bog

NEW BRUNSWICK—		
Brunswick Mineral Development Co	Hillsborough, N.B	Albert County.
BRITISH COLUMBIA—		
Carle, A. J	Ainsworth	Ainsworth.

Mica Mining Industry

QUEBEC—		
Blackburn Bros., Ltd	Blackburn Bldg., Ottawa	East Templeton, Que.
Cross, W. C	Cascades, Que	Hull Tp.
Ellard, Ellen Miller	Wright, Que	Alleyn, Tp.
Flynn, H. T	31 Montcalm St., Hull. Que	
Laurel Mining Co., Ltd	4 Rue des Forges, Trois Rivières	Argenteuil County.
Martin, A. G	236 Besserer St., Ottawa	Hull Tp.
McGlashen, R. J	190 Montcalm St., Hull	Wakefield.
Nault, J. B	Maniwaki, Que	Cameron Tp.

Mica Mining Industry—Concluded

Name	Address	Location
ONTARIO—		
Bennett, H. V	Perth, Ont	
Burke, Jas	Perth, Ont	
Kent Bros	114 Gore St., Kingston, Ont	Bedford Tp.
Lee, W. W	Bedford Mills, Ont	Buck Lake.
Loughborough Mining Co., Ltd	Sydenham, Ont	Frontenac County.
Martin, A. G	236 Bessorer St., Ottawa	Portland, Ont.
Powers, T. G	Stanleyville, Ont	Bedford Mills.

Mineral Waters Industry

QUEBEC—		
Abenakis Springs Co	Abenakis Springs, Que	Yamaska Co.
Roy, L. A	St. Germain, Que	L'Islet Plate.
L'eau Naturelle Purgative de Chambord	Desbiens, Que	Chambord.
ONTARIO—		
Canada Dry Ginger Ale, Ltd	6380 St. Urbain St., Montreal	Caledonia Springs.
Calrsbad, Ltd	Carlsbad Springs	Gloucester Tp.
Deneault, F	Bourget, Ont	
Goderich Mineral Water Co	Goderich, Ont	Goderich.
Gurd, Chas. & Co., Ltd	1016 Bleury St., Montreal	Caledonia Tp.
Sanitaris, Ltd	Arnprior, Ont	Packenham Tp.

Phosphate Mining Industry

QUEBEC—		
Blackburn Bros	Blackburn Bldg., Ottawa	Templeton Tp.
BRITISH COLUMBIA—		
Consolidated Mining and Smelting Co., Ltd	Trail, B.C	Fernie, B.C.

Pyrites Mining Industry

ONTARIO—		
Canadian Pyrites, Ltd	Guardian Bldg., Clevalend, O	Flower Station.
BRITISH COLUMBIA—		
Britannia Mining and Smelting Co., Ltd	Britannia Beach, B.C	Vancouver, B.C.

Quartz Mining Industry

NOVA SCOTIA—		
River Dennis Sand and Clay Co	Port Hood, N.S	
QUEBEC—		
Cameron, J. J	Box 11, Buckingham, Qoe	Buckingham.
Canadian Carborundum Co., Ltd	Niagara Falls, Ont	St. Canut, Que.
Canada Glass Products	193 Main St, Hull, Que	
Donaldson, R. J	Glen Almond	Buckingham.
Mason, James H	803 St. Clarens Ave., Toronto	Guigues, Que.
Montpetit, Euclide	Melocheville, Que	
O'Brien and Fowler, Ltd	Buckingham, Que	Derry Tp.
Parcher, Alfred	Glen Almond, Que	Derry.
Poulneaud, Gonzague	Buckingham, Que	
Silico, Ltd	Sumner Bldg., Montreal	St. Canut.
Winning & Downing	Notre Dame de la Salette, Que	Buckingham, Tp.
MANITOBA—		
Lake Bar Sand and Gravel Co	Water St., Winnipeg, Man	
BRITISH COLUMBIA—		
Consolidated Mining & Smelting Co., Ltd	Trail, B.C	Penticton.
Granby Consolidated Mining & Smelting Co., Ltd.	Hall Bldg., Vancouver	Nass River M. D.

Salt Industry

Name	Address	Location
NOVA SCOTIA—		
Malagash Salt Co	New Glasgow, N.S	Malagash
ONTARIO—		
Brunner, Mond Canada, Ltd	501 Dominion Bank Bldg., Toronto	Amherstburg.
Canadian Industries, Ltd	Box 1260, Montreal, Que,	Sandwich.
Dominion Salt Co., Ltd	Sarnia, Ont	Sarnia.
Goderich Salt Co., Ltd	Goderich, Ont	Goderich
Kincardine Salt Co., Ltd	Kincardine	Kincardine.
Western Canada Flour Mills Co., Ltd	287 MacPherson Ave., Toronto	Goderich.
Western Salt Co., Ltd	Courtright, Ont	Courtright.

Silica Brick Industry

NOVA SCOTIA—		
Dominion Iron and Steel Co., Ltd	Sydney, N.S	Cape Breton.
ONTARIO—		
Algoma Steel Corporation, Ltd	Sault Ste. Marie, Ont	

Sodium Carbonate Mining Industry

BRITISH COLUMBIA—		
British Columbia Chemical Co., Ltd	410 Seymour St., Vancouver	Clinton, B.C.
Dominion Soda Producers, Ltd	744 Hastings St. W., Vancouver	Cariboo.

Sodium Sulphate Mining Industry

SASKATCHEWAN—		
Bishopric and Lent Co	Gerke Bldg., Cincinnati, Ohio	Expanse.
Sodium Sulphate Refining Co., Ltd	513 Lougheed Bldg., Calgary	Fusiliers.
White Stone Salts & Chemical Co., Ltd	North Battleford, Sask	Polo, Sask.

Talc and Soapstone Industry

QUEBEC—		
Robertson Soapstone & Quarry Co., Ltd	Broughton Station, Que	Broughton.
ONTARIO—		
Canada Talc Co., Ltd	Madoc, Ont	Madoc, Ont.
Gillispie, Geo. H. & Co., Ltd	Box 232, Madoc	Madoc.
BRITISH COLUMBIA—		
B.C. Refractories, Ltd	Georgia Viaduct, Vancouver	Anderson Lake.

Volcanic Dust Industry

SASKATCHEWAN—		
Van-Kel Chemical Co., Ltd	Swift Current, Sask	Beverley.

CLAY PRODUCTS AND OTHER STRUCTURAL MATERIALS

CLAY PRODUCTS INDUSTRY

Brick and Tile

Name	Address	Location
NOVA SCOTIA—		
Brooks, Geo. & Sons	New Glasgow	Plymouth.
Brooks, Stephen & Sons	Box 359, New Glasgow	New Glasgow.
Miller Jas. B	Elmsdale	Barney Brook.
Nova Scotia Clay Works, Ltd	Box 140 Halifax	Elmsdale.
Shaw, L. E., Ltd	Avonport	Avonport.
NEW BRUNSWICK—		
Ryan, M. & Son, Ltd	Woodstock Road, Fredericton	Fredericton.
Shaw, L. E., Ltd	Chipman	Chipman.
QUEBEC—		
Ascot Till and Brick Co., Ltd	Ascot, Que	Canton Ascot.
Bell, W. and D	1286 St. Valier St., Que	Little River Road.
Citadel Brick, Ltd	14 St. Joseph St., Quebec	Levis, Co.
Chicoutimi Brick Ltd	Chicoutimi	Chemin St. Paul.
Cooksville, Co., Ltd	320 Canada Cement Bldg., Montreal	Delson.
Eastern Townships Brick and Tile Co., Ltd	East Angus, Que	East Angus.
Frontenac Brick, Ltd	140 Rue St. Jean, Quebec	Quebec Co.
Hodgins, David T	Shawville, Que	Clarendon, Co.
Islet Brick Co., Ltd	L'Islet, Que	L'Islet Station.
Lennoxville Brick and Tile Co., Ltd	Lennoxville, Que	Lennoxville.
Longpre, Emile	St. Felix de Valois, Que	
Lotbiniere Brick Ltd	Deschaillons, Que	Deschaillons.
National Brick Co. of Laprairie, Ltd	Canada Cement Bldg., Montreal	Laprairie, Delson.
St. Tite Industry	St. Tite, Que	St. Tite.
St. Lawrence Brick Co., Montreal	29 Rue St. Jacques W., Montreal	Laprairie.
Scott Brick Co., Ltd	Scott Junction	Dorchester Co.
Standard Clay Products	St. Johns, Que	St. Johns.
ONTARIO—		
Baird and Son	Parkhill, Ont	Parkhill.
Barnhardt, W. H	Stratford, Ont	Stratford.
Batchelor, Samuel	Proton Station, R.R. 3	Artemessia.
Bay of Quinte Brick Works	Belleville, Ont	Belleville.
Booth Brick and Lumber Co	Box 61 New Toronto	Etobicoke Tp.
Brampton Pressed Brick, Ltd	Brampton, Ont	
Broodwell, B. and Son	Kingsville, Ont	Gosfield South.
Butwell, Richard	107 Lake Shore Road, Humber Bay	Humber Bay.
Caledon Shale-Brick, Ltd	1167 Bay St., Toronto	Caledon Tp.
Campbell, N. F. and Sons	West Lorne, Ont	Aldborough, Tp.
Canadian Fire Clay Products, Ltd	604 Adelaide St. E., Toronto	New Toronto.
Canadian Pressed Brick Co., Ltd	195 Ottawa St. S., Hamilton	Hamilton.
Casemore and Sons	Shallow Lake, Ont	
Chapman Bros	104 Dawes Rd., Toronto	East York Tp.
Chapman, J	R.R. 3, Napanee, Ont	N. Fredericksburgh Tp.
Cooksville Co., Ltd	120 St. James St., Montreal	Cooksville, Ont.
Cornhill, James and Sons, Ltd	Grand Ave., Chatham	Chatham, Tp.
Cooper, W. H	608 Lister Block, Hamilton	Hamilton.
Cowell Bros	Tillsonburg	
Curtin, Frank	R.R. 4, Lindsay	Lindsay.
Curtis Bros	Box 839, Peterboro	Otonabee Tp.
Dalton, Mark	Dresden, R.R. No. 3	Dawn Tp.
De LaPlante, J. E. and Co	Coleman, P.O., Ont	East York Tp.
Dellet, Albert and Son	Brownsville	Brownsville.
Deller Bros	R.R. 2, Norwich	North Norwich.
Deller, Wm. H	R.R. 4, Thorndale	West Missouri.
Denison Tile Co., Ltd	24 Wyandotte St. E., Windsor	Tilbury East, Rochester Tp.
Dochart Brick, Tile and Terra Cotta Works	Arnprior, Ont	Arnprior.
Dolan, John	R.R. 2, Watford	Warwick Tp.
Donaldson and Son	R.R. 4, Harriston	Minto Tp.
Donaldson, Thomas George	R.R. 1, Greenock	Culross Tp.
Douglas and Douglas	Wilkesport	Sombra Tp.
Don Valley Brick Works Ltd	324 Federal Bldg., Toronto	York Tp.
Elliott Chas	Bluevale	
Elliott James Jr	519 Wellington St. W., Sault Ste. Marie.	Norah Tp.
Elliott, Wm	Glenannan, R.R. 1	Culross Tp.
Frid Bros	Dundas Road, Hamilton	Dundas and Macklin.
Gammager, C. R	R.R. 2, Dresden	Camden Tp.
Gardiner, Wm	Box 83, Blenheim	Howick Tp.
Godfrey, Thomas and Co	Carleton Place	Beckwith.
Grimsby Brick and Tile, Ltd	Grimsby	Grimsby.
Haist, R. W	Crediton	
Hallatt and Son	Comber	Comber.
Hallatt, W. Clay Products	4 Richards Blk., Chatham	Raleigh Tp.
Halton Brick Co., Ltd	28 Symes Rd., Toronto 9	Halton Co.
Hamilton Pressed Brick Co., Ltd	Kensington Ave. S., Hamilton	Hamilton.
Hill, Aaron	Box 217, Essex	Essex.

Brick and Tile—Continued

Name	Address	Location
ONTARIO—*Concluded*		
Hill, A. W.	R.R. 1, Coastworth	Tillbury East.
Hitch, H. A.	Ridgetown	
Hitch, Thomas	1st Ave., St. Thomas	Yarmouth Tp.
Hodder, Mrs. J. H. and Sons	Dutton	Dunwick Tp.
Housten Co., Ltd.	Box 130, Belleville	Hungerford Tp.
Howlett, F. W. and Sons, Ltd.	Box 3, Petrolia	Petrolia
Huntsville Brick Works	Huntsville	Chaffey Tp.
Interprovincial Brick Co., Ltd.	26 Queen St. E., Toronto	Halton Co.
Jackson, W. B.	290 Rawdon St. Brantford	Brantford.
Jameson, J. A.	Renfrew	Renfrew.
Janes, D. A.	Mt. Brydges	Caradoc Tp.
Jervis, W. J.	R.R. 3, Dorchester	N. Dorchester Tp.
Johnson, James Sr.	Pembroke, R. R. 3	Stafford Tp.
Jasperson Brick and Tile Co.	Box 586 Kingsville	Coatsworth.
Kerr, Frederick	Crediton	
Koehel Bros.	Box 54, St. Clements	Wellesly Tp..
Lindsay, Earl	R.R. 2, Wallaceburg	Chatham Tp.
Martin, Thos. E.	Thamesville	Howard Tp.
Maw, Wm. T.	Minesines	
McComb, Chester	R.R. 2, London	London Tp.
McCormick Bros.	R.R. 5, Watford	Warwick Tp.
McEachern and Sons	Highgate	Highgate.
McFarren, F. B., Ltd.	18 Toronto St., Toronto	
McFarlane, W. J.	Box 143 Forest	Forest.
McMahon, Robert	R.R. 2, Kerwood	Metcalfe Tp.
Middleton, Chas.	Wyoming	Plympton Tp.
Milton Brick, Ltd.	1158 Bay St., Toronto	Milton.
Miner, Manly F.	Kingsville	
Moulton, John	Holyrood, R.R. 2	Greenock Tp.
National Sewer Pipe Co., Ltd.	Aldershot	Aldershot.
New Liskeard Brick Works	Box 74 New Liskeard	New Liskeard.
Ontario Brick and Tile Plant	Prov. Sec. Ontario Govt., Toronto	Mimico.
O'Reilly, T. E.	320 Bay St., Ottawa	Prescott Road.
Ott Brick and Tile Mf'g. Co., Ltd.	33 King St. E., Kitchener	Kitchener
Ottawa Brick and Terra Cotta Co., Ltd.	Billings Bridge	Gloucester Tp.
Ottman Bros.	111 Macklin St., Hamilton	Hamilton.
Owen Sound Brick Co., Ltd.	Owen Sound	Owen Sound.
Parke, H. N.	R.R. 2, Dresden	Camden Tp.
Paxton, Fred. R.	70 Herrick Ave., St. Catharines	St. Catharines.
Pembroke Brick Co.	Pembroke	Pembroke.
Phinn Brick Co.	St. James Park, London, Ont.	Westminster Tp.
Phinn, Geo. A.	238 Briscoe Ave., London	
Phippen and Field	Box 11, Coleman	East York Tp.
Pigott, Geo. and Co.	72 Guestville Ave., Toronto	York Tp.
Piper, Murphy and Piper	509 Victoria Ave., Fort William	Fort William.
Port Rowan Brick and Tile Co.	Port Rowan	Port Rowan.
Price and Cummings	Salisbury Ave., Thunder Bay	Humber Bay.
Price and Smith	458 Greenwood Ave., Toronto	
Richardson, J. and Son	Kerwood	Kerwood.
Russell Brick Co.	40 Blake St., Toronto	Toronto.
Sherman Clay Products, Ltd.	Kingsville	Rochester Tp.
Snelgrove A.	Beaverton	Thorah Tp.
Sproat, Wm. M.	R.R. 4, Seaforth	Tuckersmith Tp.
Standard Brick Co., Ltd.	500 Greenwood Ave., Toronto	Toronto.
Staples Brick and Tile Co.	Staples	Staples.
Stute, Edwin	Yankleek Hill	Yankleek Hill.
Stroh, M. C.	Conestogo	Woolwich.
Sun Brick and Tile Co., Ltd.	1104 Bay St., Toronto	Don Valley.
Superior Brick and Tile Co., Ltd.	426 Victoria Ave., Fort William	Paipoonge Tp.
Sutherland W. A.	Box 293, Parkhill	Parkhill
Telford, J. C.	Southwold Station	Southwold Station.
Thompson, R.	Renfryn	
Tope, R., Estate	945 King St. W., Hamilton	Hamilton.
Toronto Brick Co., Ltd.	897 Bay St., Toronto	Toronto.
Voakes and Son	Box 20 Ruscomb	Rochester Tp.
Wagstaff, Chas.	R.R. 4, Lindsay	
Wagstaff Brick Works	348 Greenwood Ave., Toronto	Toronto.
Waide, J. C.	Alvinston, Ont.	Alvinston.
Waite, John E.	Foresters Falls	Ross Tp.
Wallace, R. and Son	34 Main St. W., North Bay	Widdifield Tp.
Watson, W. S.	Thedford	Basanquet Tp.
Wein, Aaron	Crediton	Stephen Tp.
Weitzel, J. C.	Tavistock	
Winch, Stuart A.	Box 220, Paisley	Elderslie Tp.
Windsor Brick and Tile Co.	Windsor	Division Road.
Wright, Geo. and Sons	Box 56, Comber	Tillbury West Tp.
MANITOBA—		
Alsip Brick, Tile and Lumber Co., Ltd.	537 Portage Ave., Winnipeg	Winnipeg.
Marion, J. A.	Box 30, St. Boniface	St. Boniface.
National Clay Products, Ltd.	915 Somerset Blk., Winnipeg	Edrans.
Reliance Brick Co.	Whitemouth	
Snyder, A. and Co., Ltd.	Portage la Prairie	Portage la Prairie.
Snyder, M. and Sons	Gilbert Plains	Gilbert Plains.

Brick and Tile—Concluded

Name	Address	Location
SASKATCHEWAN—		
Bruno Clay Works, Ltd	Bruno	Bruno.
Dominion Firebrick and Clay Products, Ltd	106 Kern Bldg., Moose Jaw	Claybank.
International Clay Products, Ltd	Box 399, Estevan	Estevan, Prince Albert.
Shand Coal and Brick Co	Shand	Sec. 4-2-7, W. 2nd. M.
ALBERTA—		
Acme Brick Co., Ltd	125 Alberta Blk., Edmonton	Cannel Siding.
Crandell, E. H. Pressed Brick and Sandstone Co.	607 MacLean Block, Calgary	Brickburn.
Johnsen, Knut	Box 1722, Grande Prairie	Grand Prairie.
Little, J. B. and Sons, Ltd	9120—100 and E Ave., Edmonton	Edmonton.
Medicine Hat Brick and Tile Co., Ltd	Medicine Hat	Medicine Hat.
Redcliff Brick and Coal Co., Ltd	Redcliff	S. 5, T. 13, R. 6, W. 4th.
Redcliff Pressed Brick Co., Ltd	Redcliff	Redcliff.
Redcliff Premier Brick Co., Ltd	Box C2, Redcliff	Redcliff.
BRITISH COLUMBIA—		
Baker Brick and Tile Co., Ltd	Douglas St., Victoria	Victoria.
Clayburn Co , Ltd	302 West Hastings St., Vancouver	Kilgard.
Gabriola Shale Products, Ltd	Moody Blk., Victoria	Gabriola Island.
Haag, Wm. and Son	Box 166, Kelowna	Kelowna.
Pacific Brick, Ltd	801 Stock Exchange Bldg., Vancouver	New Westminster.
Port Haney Brick Co., Ltd	846 Howe St., Vancouver	Port Haney.
Smithers Brick Yard	Smithers	Smithers.
Vancouver Brick and Tile Co	2521 Maple St., Vancouver	Sullivan.
Victoria Brick Co., Ltd	Douglas St., Victoria	Victoria.

Clay Sewer Pipe

NOVA SCOTIA—		
Standard Clay Products, Ltd	St. Johns, Que	New Glasgow.
QUEBEC—		
Standard Clay Products, Ltd	St. Johns, Que	St. Johns.
ONTARIO—		
National Sewer Pipe Co., Ltd	Aldershot	Hamilton. Mimico.
ALBERTA—		
Alberta Clay Products Co., Ltd	Box 672, Medicine Hat, Alta	Dunmore.
BRITISH COLUMBIA—		
Clayburn Co., Ltd	850 W. Hastings St., Vancouver	Clayburn.

Firebrick, Fireclay and Fireclay Products

NOVA SCOTIA—		
Dominion Iron and Steel Co., Ltd	Sydney	Sydney.
NEW BRUNSWICK—		
Foley Pottery, Ltd	Lock Lomond Rd., St. John	St. John.
QUEBEC—		
Montreal Terra Cotta Co., Ltd	Drummond Bldg., Montreal	Lachine.
ONTARIO—		
National Fire Proofing Co., Ltd	601 Dominion Bank Bldg., Toronto	Aldershot.
ALBERTA—		
Alberta Clay Products Co., Ltd	Box 672, Medicine Hat	Dunmore-Ravenscrag.
BRITISH COLUMBIA—		
B.C. Refractories, Ltd	Georgia Viaduct, Vancouver	Vancouver.
Clayburn Co., Ltd	850 Hastings St. W., Vancouver	Kilgard.

Stoneware and Pottery

NEW BRUNSWICK—		
Foley Pottery, Ltd	Lock Lomond Rd., St. John	St. John.
ONTARIO—		
Davis, John and Son, Ltd	601 Merton St., Toronto	Merton St., Toronto.
Foster Pottery, Co	Main St. W., Hamilton	Hamilton.
ALBERTA—		
Medalta Potteries, Ltd	Medicine Hat	Medicine Hat.

Other Structural Materials.

Cement Industry

Name	Address	Location
QUEBEC—		
Canada Cement Company, Ltd	Canada Cement Bldg., Montreal	Hull.
National Cement Co	Box 2770, Montreal	Montreal East.
ONTARIO—		
Canada Cement Company, Ltd	Canada Cement Bldg., Montreal	Belleville. Lakefield. Welland County.
St. Mary's Cement Co., Ltd	357 Bay St., Toronto	St. Mary's.
MANITOBA—		
Canada Cement Company, Ltd	Canada Cement Bldg., Montreal	Fort Whyte.
ALBERTA—		
Canada Cement Co., Ltd	Canada Cement Bldg., Montreal	Exshaw.
Marlboro Cement Co	Edmonton	Marlboro.
BRITISH COLUMBIA—		
British Columbia Cement Co., Ltd	305 Belmont Bldg., Victoria	Bamberton.

Lime Industry

NOVA SCOTIA—		
Eastern Lime Co., Ltd	Windsor	Windsor.
Nat. Trust Co. (Dominion Iron & Steel)	Sydney	Point Edward.
NEW BRUNSWICK—		
Bathurst Power and Paper Co., Ltd	Bathurst	Port Daniel.
Peters, C. H. and Sons, Ltd	71 Dock St., Saint John	Torryburn.
Purdy and Green	323 Main St., St. John	St. John.
Snowflake Lime, Ltd	3 Pokiok Rd., St. John	St. John.
QUEBEC—		
Baron, A	St. Dominique	St. Dominique.
Beaudry, A	Joliette	Joliette.
Boivin, Arthur	Pont Rouge	Pont Rouge.
Canada Lime and Stone, Ltd	St. Marc des Carrières	
Dominion Lime Co	East Angus	Lime Ridge.
Ducharme, Colbert	Guigues, cte. Temiscamingue	Guigues.
Heon, Octave	St. Louis de France	Ste. Marguerite.
Lalumière, Joseph	St. Dominique de Bagot	St. Dominique de Bagot.
Laurentian Stone Co	250 Catherine St., Ottawa, Ont	Hull.
Limoges, Fils & Cie	552 rue Poupart, Montreal	St. Michel.
Shawinigan Chemicals, Ltd	83 Craig St., Montreal	Bedford.
Standard Lime Co., Ltd	Joliette	St. Paul de Joliette. St. Marc des Carrières.
Stinson-Reeb Builders' Supply Co., Ltd	360 Dorchester St. W., Montreal	
ONTARIO—		
American Cyanamid Co	535 Fifth Ave., New York, N.Y.	Beachville.
Beachville Lime and Stone, Ltd	Paris, Ont	Beachville.
Biederman, Albert G	Golden Lake R.R. 1	Golden Lake.
Brunner-Mond Canada, Ltd	501 Dominion Bank Bldg., Toronto	Anderdon.
Cameron, W. M	Carleton Place	Carleton Place.
Canada Gypsum and Alabastine, Ltd	Elora	Elora.
Canada Lime Co., Ltd	Coboconk	Coboconk.
Chalmers Lime Works	689–7th St. W., Owen Sound	Owen Sound.
Dominion Rock Products, Ltd	1017 New Birks Bldg., Montreal	Eganville.
Dominion Sugar Co., Ltd	Chatham	Wallaceburg. Chatham.
Gallagher Lime and Stone Co., Ltd	Upper James St., Hamilton	Barton Tp.
Gypsum, Lime and Alabastine Co	Paris	Limehouse. Puslinch Tp.
Jamieson Lime Co	Renfrew	Horton Tp.
Kinkley, H	Napanee	
Shane Lime Co	Eganville	Eganville.
Standard White Lime Co	15 Douglas St., Guelph	Guelph.
Toronto Brick Co., Ltd	897 Bay St., Toronto	Coboconk.
Weppler, Henry	R.R. 2, Priceville	Glenelg Tp.
MANITOBA—		
Canada Gypsum and Alabastine Co	Box 3057, Winnipeg	
Gillis Quarries, Ltd	Richard Ave., Winnipeg	Garson.
Moosehorn Lime Co., Ltd	214 Avenue Block, Winnipeg	Moosehorn.
Winnipeg Supply and Fuel Co., Ltd	214 Avenue Block, Winnipeg	Stonewall.
ALBERTA—		
Loder's Lime Co., Ltd	Kananaskis	Kananaskis.
Summit Lime Works	Box 273, Lethbridge	S. ½, S. 7, Tp. 8, R. 5, W. 5.
BRITISH COLUMBIA—		
Hedley Gold Mining Co	Hedley	Hedley.
Pacific Lime Co., Ltd	744 Hastings St. W., Vancouver	Texada Island.
Pacific Mills, Ltd	Standard Bank Bldg., Vancouver	Gunboat Pass.
Rosebank Lime Co	744 Hastings St. W., Vancouver	Esquimalt.

Sand and Gravel

Name	Address	Location
NOVA SCOTIA—		
Campbell, J. J. and Son	Boisdale	Boisdale.
Foundation Co. of Can., Ltd	Guy and Sherbrooke St., Montreal	Milton.
MacNeil Bros	Box 593, North Sydney	Sydney Mines.
Mosher, Walter	307 Portland St., Dartmouth	Elmsdale.
Norrie, Henry J	R.R. 6, Truro	
Nova Scotia Dept. of Highways	Halifax	Long Island, Falleigh Lake.
Nova Scotia Power Commission	Halifax	Pembrook Shore.
Routledge, W. F	Reserve Mines, C.B	Lingan, C.B.
Walker, Adam	Bridgetown	
NEW BRUNSWICK—		
Canadian Independent Oil ,Ltd	Box 729, St. John	East St. John.
Likely, Jos. A	St. John	East St. John.
Maxwell, Chas. O	R.R. 3, St. Stephen	Charlotte County.
QUEBEC—		
Alcoa Power Co. Ltd	Box 629 Kenagami	Simard Canton.
Asbestos Corporation	Thetford Mines	Thetford, Tp.
Belanger, Joseph	Ascot Corner	
Belisle, Euclide	Coaticook	Coaticook.
Benjamin, Pierre	197 St. Pierre, St. John	Mt. St. Gregoire.
Benoit, J. A	Mt. St. Gregoire	Mt. St. Gregoire.
Bergeron, Ursin	Jonquière	Jonquière.
Bishop, Wm. L. Ltd	New Birks Bldg., Montreal	Lièvre River.
Blais, Jos	10 Ave. Mont-Marie, Levis	St. Romuald.
Box, Wm. F	R.R. 3, Lachute	
Bourgeois, Edmond	St. Albert	
Bonner Sand and Ballast, Ltd	1434 St. Catherine St. W., Montreal	Durham Tp.
Brault, Wm	16—1st Ave. S., Sherbrooke	Orford Canton.
Boivin, Thomas	7 Ave. Lafontaine, Chicoutimi	Chicoutimi.
Brault, F. X	St. Dominique	St. Dominique.
Brault, D	St. Alexandre	St. Alexandre.
Breen, Thos	Chemenis	Dasserat.
Brouillet Sand and Gravel Co., Ltd	Rawdon	St. Julienne
Canadian Import Co	83 Dalhousie St., Quebec	St. Charles River.
Canadian Johns-Manville Co.	Asbestos	Shipton Tp.
Cantin, Chas	St. Romuald	St. Romuald.
Cloutier, J. F	100 Rue Cartier, Chicoutimi	Chicoutimi.
Coaticook Town	100 Child St., Coaticook	Coaticook.
Consolidated Oka Sand and Gravel Co., Ltd	248 McCord St., Montreal	St. Maurice River.
Construction Society	7 Ave. Lafontaine	Chicoutimi.
Coté, Eli	Hébertville	Lake St. John.
Dalcourt, Henri	R.R. 1, St. Felix de Valois	St. Felix de Valois.
Deslandes, Mastai	St. Dominique	St. Dominique.
Dominion Sand and Stone Co., Ltd	865 Roy St. E., Montreal	South Durham.
Dubreuil, Albert	St. Dominique	St. Dominique.
Dubuc, J. E. A	Chicoutimi	Chicoutimi.
Dupuis, H. and Sons, Ltd	Maisonneuve St., Hull	Hull.
Gagné, Mde. B. A	Boischatel	Boischatel.
Gagnon and Potvin	St. Joseph d'Alma	Lake St. John.
Gagnon, Louis Philippe	St. David de Lévis	St. Telesphore.
Granger, Ildege	St. Marie Salome	St. Marie Salome.
Guerdin, Arsene	Beloeil	St. Hilaire.
Hemmingford Municipality	Hemmingford	Huntingdon.
Houde, Fred. Dr	8 Du Platon St., Three Rivers	Three Rivers.
Independent Sand Co., Ltd	3731 Notre Dame St. E., Montreal	Lake St. Peter.
Le Beau, Adelard	St. Dominique	St. Dominique.
Letourneau, Arthur	St. Remi	St. Remi.
Massicotte, J. E	Arvida	Rivière du Moulin.
Montreal City	City Hall, Montreal	St. Felix de Valois.
Montreal Harbour Commission	City Hall Montreal	St. Lawrence River.
Paradis, G. H	Hébertville	Hébertville.
Paradis, Pitre	Hébertville	Hébertville.
Pepin, L. A	159 St. Roch, Three Rivers	
Poliquin, Napoléon	42 St. Henri St., Sherbrooke East	Ascot Tp.
Prefontaine, Octave	Beloeil	Beloeil.
Quebec City	City Hall, Quebec	Beauport.
Quebec Dept. of Roads	Quebec	
Quebec Harbour Commission	Quebec	Inner Basin.
Raymond, Laurent	140 Brooks St. Sherbrooke	
Robert, Pierre	Beauportville	
St. Louis, Nap	St. Ursule	
Sanmure, Octave	Bouchette	Bouchette.
Sand Company, Ltd	10 Limoilou Ave., Quebec	St. Charles River.
Sherbrooke City	Sherbrooke City	Orford Tp.
Sorel Sand Co., Ltd	St. Joseph de Sorel	St. Lawrence River.
Standard Lime Co., Ltd	Joliette	St. Emelie.
Thibault, Maurice	Cap de la Madeleine	
Verret, Louis	Lake St. Charles	
Vezina, Edouard and Son	St. Joseph de Levis	
ONTARIO—		
Adair, Dolsan	R.R. 2, Caledon East	Caledon Tp.
Allan, Jas	Seaforth	Tuckersmith Tp.
Armstrong Supply Co., Ltd	1143 York St., Hamilton	Hamilton.
Oxford, J. B. and Sons	35 Elm St., St. Thomas	Yarmouth Tp.

Sand and Gravel—Continued

Name	Address	Location
ONTARIO—*Continued*		
Ashton, Thomas	1354 Queen St. E., Toronto	Scarboro.
Austin, N.B	Box 48, Erin	Erin.
Backus Brooks Co	1100 Builders' Exchange, Minneapolis, Minn.	Fort Francis.
Bast, Aaron	Bridgeport	Waterloo Tp.
Bellyou, N. E	R.R. No. 4, Trenton	Murray Tp.
Benson and Patterson	Stamford	Stamford.
Bissonnette, W. A	Box 595, Smith's Falls	Montague Tp.
Brantford, City of	City Hall, Brantford	Brantford.
Boyd Bros	Box 28, Osgoode	Osgoode Tp.
Burrows, John	447 Klock Ave., North Bay	Widdifield Tp.
Cameron, Chas. M	R.R. No. 1, Glencoe	Middlesex Co
Conlin, Herbert L	156 Front Street East Toronto	Highland Creek.
Carroll Bros	490 Ellicott Square, Buffalo	Sherkston.
Chisholm, W. G	R.R. 3, Milton.	Halton Tp.
Cudmore, Mrs. Bertha	R.R. 6, Thamesville	Howard Tp.
Cudmore, Mrs. Alice	R.R. 1, Hensall	Huron County.
Cuthbert, C. E	Currier	Oxford West.
Dominion Concrete Co., Ltd	Kemptville, Box 103	Gower Tp.
Donald, Andrew	R.R. 1, Ingersoll	Oxford County.
Dowler Bros	Billings Bridge	Bowesville Rd.
Durham Stone and Sand Co., Ltd	402 Harbour Bldg., Toronto	Durham.
Ellins Bros	Postal Stn. "D", West Toronto	Etobicoke Tp.
Empire Limestone Co	19 Hudson St., Buffalo	Sherkston.
File, Secord	43 Port St., Brantford	Lynden.
Foster, R. R	278 Echo Drive, Ottawa	Nepean Tp.
Fraser, S. A	R.R. 1, Arnprior	Arnprior.
Frid Bros	Dundas Rd. and Macklin St., Hamilton.	Hamilton.
Fuller Gravel Co., Ltd	402 Harbour Bldg., Toronto	Fuller.
Goodreau, Chas	R.R. 6, Thamesville	Chatham Tp.
Gregory Milton	Kirkton	Osborne Tp.
Grey Township—J. M. Bray	R.R. 2, Brussels	Grey Tp.
Harbour Brick Co., Ltd	Fleet St., Toronto	
Higgs, Thos	R.R. 7, London	
Hill, J. D	R.R. 6, Woodstock	East Dennis.
Hinde Bros	134 Northlands Ave., Mt. Dennis	Mt. Dennis.
Hopping, R. G	226 High St., London	Manor Park.
Howard, N. H	Aldershot	Flamboro Tp.
Hydro Electric Power Commission of Ontario	190 University Ave., Toronto	Hydro.
Jago Concrete Products Co	Summerville	Toronto Tp.
Keyes, S. W	Woodstock, R.R. 8.	
Kilbourne, H. and Sons	145 Wharncliffe Rd., London	Westminster Tp.
Kingston Penitentiary	Portsmouth	Portsmouth.
Kingston Sand and Gravel Co., Ltd	183 William St., Kingston	Kingston Tp.
Lawson, James	R.R. 2, Blyth	Morris Tp.
Leaside Brick and Sand Co	Leaside	Leaside.
Le Viness, S	R.R. 3, Niagara Falls	Stamford.
Lovelace, E. J	St. Catharines	St. Catharines.
Lowe, G. G	R.R. 1, Leonard	Cumberland Tp.
MacArthur, Kenneth	Ailsa Craig	Ailsa.
Maple Sand, Gravel and Brick Co	454 King St. W., Toronto	Maple.
Moone, John	R.R. 1, Ailsa Craig	East William Tp.
Nagle, Jos	Dublin	Hibbert Tp.
Northern Development Dept	Parliament Bldgs., Toronto	
Ollman Bros	111 Macklen St., Hamilton	Hamilton.
Ontario Dept. of Highways	Parliament Bldgs., Toronto	
Peterborough, City of	133 Simcoe St., Peterborough	Peterborough.
Panafond, A. E., Estate of	605 Talbot St., St. Thomas	Yarmouth Tp.
Quick, Chas. R	101 Briscoe St., London	Manor Park.
Quigley's	317 Main St. E., Hamilton	Bartonville.
Ratcliffe, E. B., Ltd	King St. ,Bartonville	Barton Tp.
Regan and Blackburn	1550 Dufferin St. Toronto	Mt. Dennis.
Robinson, Wm	R.R. 1, Crediton	Crediton.
Sand and Supplies, Ltd	74 University Ave., Toronto	Waterloo.
Sarjeant Co., Ltd	51 Dunlop St., Barrie	Barrie.
Scheerer Conrad	R.R. 1, Stratford	Stratford.
Seebach, Ed	R.R. 1, Sebringville	Ellice Tp.
Shirman and Hubbell	R.R. 5, Thamesville	Camden Tp.
Smythe, C., Ltd	Colonial Bldg., Toronto	Etobicoke Tp.
Stevens, J. H	Box 211, Stoney Creek	Stoney Creek.
Tack, Henry	Sub. I, London	London Tp.
Valley, Frank	Box 107, Belwood	W. Garafraxa.
Waterford Sand and Gravel Co., Ltd	402 Harbour Bldg., Toronto	Waterford Co.
White Homer and Co	Picton	Hallowell Tp.
Wilks, George	26 Railway St., Woodstock	Woodstock Tp.
Wilson, M	R.R. 1, Maple	Vaughan Tp.
Windsor Sand and Gravel Co., Ltd	109 Ottawa St., Walkerville	Essex Co.
Wilcox, Hervey	985 Bridge St., Niagara Falls	Stamford Tp.
Wright and Co	960 Queen St., Sault St. Marie	Dist. of Algoma.
York Sand and Gravel Co	Toronto	York Co.

Sand and Gravel—Concluded

Name	Address	Location
MANITOBA—		
Buildings Products and Coal Co., Ltd	Christie St., Winnipeg	Woodland.
Brandon City	City Hall, Brandon	Brandon.
Cumming and Dabbie	233—9th St., Brandon	Brandon.
Cusson, J. A	379 Desautels, St. Boniface	St. Anne du Chêne.
Greater Winnipeg Water Dist	Civic Offices, Winnipeg	G. W. W. D. Railway.
Lake Bar Sand and Gravel Co	Notre Dame East, Winnipeg	Black Island Lake.
McCurdy Supply Co., Ltd	136 Portage Ave. East	Birds Hill.
Riley, W. J	Molson	Molson.
Sinnott, S. J	St. Ouens	St. Ouens.
Winnipeg City Hydro Electric	55 Princess St., Winnipeg	Slave Falls.
SASKATCHEWAN—		
McKenzie Supply Co., Ltd	Box 107 Regina	Pilot Butte.
North Battleford City	North Battleford	
Prince Albert City	City Hall Prince Albert	Prince Albert.
Saskatchewan Highways	Regina	
Weyburn Mental Hospital	Box 1056, Weyburn	Weyburn.
Weyburn Storage and Distributing Co	Weyburn	Weyburn.
ALBERTA—		
Alberta Highways	Edmonton	
Cristall Sand	10209—103 St., Edmonton	Perryvale.
Foundation Co. of Canada, Ltd	Examiner Bldg., Calgary	Radnor.
Huff Gravel, Ltd	708 Tegler Bldg., Edmonton	Heatherdown.
Nanton Town	Nanton	Nanton.
Spoke, J. C	Perryvale	Perryvale.
Sutherland, Moses	Olds	Olds.
BRITISH COLUMBIA—		
British Columbia Highways	Victoria	
Cascade Rock and Gravel Co., Ltd	False Creek, Vancouver	North Vancouver.
Columbia Bitulithic, Ltd	Granville Island, Vancouver	Vedder Dyke Road.
Consolidated Mining and Smelting Co., Ltd	Tadanac	Tadanac.
Dooks Sand and Gravel Co., Ltd	101 West 1st Ave., Vancouver	Seymour Creek.
Gilley Bros., Ltd	902 Columbia St., New Westminster	Fraser River.
Hillside Sand and Gravel, Ltd	1075 Main St., Vancouver	Howe Sound.
Johnston and Co., Ltd	Box 250 Kamloops	
Nelson, Corporation of City	City Hall, Nelson	Nelson.
Prince Rupert City of	Prince Rupert	Prince Rupert.
Producers Sand and Gravel Co., Ltd	1902 Stone St., Victoria	Esquimalt.
Swinerton, Musgrave and Wilson	640 Fort St., Victoria	Metchosin.
Vancouver, City of	City Hall, Vancouver	Vancouver South.
Vancouver Island Power Co., Ltd	1016 Langley St., Victoria	Renfrew district.

Stone Quarrying Industry—Granite

NOVA SCOTIA—		
Bower, Andrew R	Shelburne	Shelburne-Doctor Cove.
Fairview Crushed Stone Co., Ltd	Fairview	Fairview.
Dept. of Highways	Halifax	Debert.
Hoyt, C. M	Middleton	Nictaux West.
Nova Scotia Stone Co., Ltd	91 Hallis St., Halifax	Lake William.
Rice, E. A. and O. A	Lawrencetown	Nictaux West.
Rice, W. D	Middleton	Nictaux West.
NEW BRUNSWICK—		
Granite Street Pavement Co., Ltd	Hamptead	Hampstead.
Grattan, H. M. and Sons, Ltd	Wallace St., St. George	Charlotte Co.
Meating, Epps Co., Ltd	St. George	Bayside.
Milne Coutts and Co., Ltd	St. George	St. George.
Mooney & Sons, Ltd	112 Queen St., St. John	Spoon Island.
O'Brien and Baldwin	St. George	St. George.
St. John City	St. John	Shamrock Grounds.
QUEBEC—		
Alcoa Power Co., Ltd	Racine	
Angers and Toel, Ltd	229 Racine St., Chicoutimi	Chicoutimi.
B. and R. Granite Quarry	Beebe	Stanstead Tp.
Baillargeon and Côté	St. Jean	St. Luc Co.
Beebe White Granite Co	Beebe	Beebe Junction.
Bernier August	Roberval	Roberval.
Bergeron, Joseph	Shawinigan Falls	Abnuville.
Bérubé, Lucien and Son	Brownsburg	Chatham Canton.
Black Granite Co	105 Côte de la Montagne, Quebec	St. Gédéon.
Brodies, Ltd	1070 Bleury St., Montreal	Iberville Co., Guenette, Granitville.
Brunet, Joseph	663 Chemin Côte des Neiges, Montréal.	Chatham Co.
Chicoutimi, Town	Chicoutimi	St. Paul rang.
Cloutier Bros	Beebe	Beebe.
Delevoide and Goffin	Chicoutimi	St. Thomas, Rang.
Dumas, August	Rivière à Pierre	Canton Bois.

Stone Quarrying Industry—Granite—Concluded

Address	Address½	Location
QUEBEC—*Concluded*		
Dumas Art Co.	Rivière à Pierre	Canton Bois.
Duncan, Wm	Beebe	Beebe.
Foundation Co. of Canada, Ltd	1538 Sherbrooke St. W., Montreal	Trinity Bay.
Frontenac Quarries, Ltd	St. Sebastien	Whitton, Stanhope.
Gauthier, Jos. and Sons	97 Taché St., Chicoutimi	Chicoutimi
Grand Mère Town	City Hall, Grand'Mère	Ste. Flore
Hazelton, Wm M	Beebe	Stanstead Tp.
Hove Hill Granite Co., Ltd	749 Marcil Ave., Montreal	Beebe.
Kennedy Construction Co	St. Louis du Ha! Ha!	Temiscouata
Lacasse and Boulais	Beebe	Stanstead Tp.
Lavoie and Doyer	Rousseau Mill	Portneuf Co.
Marchessault, H. and Son	60 Ave. West End, Outremont	St. Jean Co.
McIntosh, Robert	Beebe	Stanstead Co.
Moneau, Polycarpe	Roberval	Roberval.
Perron, Arthur	Rivière à Pierre	Portneuf Co.
Perron, Stanislas	Rivière à Pierre	Canton Bois.
Plamondon, Granite Co., Ltd	33 Brewster, Sherbrooke	Wolfe Co.
Rigaud Granite Products, Ltd	132 rue St. Jacques, Montreal	Rigaud.
Riverin and Riverin Enrg	39 Rue Montcalm, Chicoutimi	Moulin River.
Robertson and Janin Paving Co	1460 rue Sherbrooke W., Montreal	Rosemount.
Rockland Crushed Stone Co., Ltd	1165 Bleury St., Montreal	Outremont.
Scotstown Granite Co., Ltd	Scotstown	Tingwick.
Silver Granite Co., Ltd	117 Côte d'Abraham, Que	St. Samuel Sta.
Stanstead Granite Quarries, Co	Beebe	Graniteville.
Tremblay, Jos	Baie St. Paul	Charlevoix.
Voyer, F. and Frère	Rivière à Pierre	Rivière à Pierre.
Wilkinson, Frank	Beebe	Stanstead Co.
ONTARIO—		
Crystalite Stone Products, Ltd	59 Hillyard St., Hamilton	Bancroft.
Dominion Trap Rock Co., Ltd	470 St. Alexis St., Montreal	Bruce Mines.
J. T. Ferrill	Birds Creek	Brick Hill.
Fort William City	City Hall, Fort William	Fort William.
Gordon Granite Co	Confederation Life Bldg., Toronto	Gananoque.
Grenville Crushed Rock Co., Ltd	217 Keefer Bldg., Montreal	Hawk Lake.
Hakanson Swan	Gananoque	Gananoque.
Horne, Wm	Ashford Block, Winnipeg	Butler.
Hydro Electric Power Commission	190 University Ave., Toronto	Hydro.
McKee Bros	R.R. 3, Lansdowne	Leeds Co.
Ontario Rock Co., Ltd	1501 Canada Permanent Bldg., Toronto	Belmont Tp.
Peninsula Granite Quarries, Ltd	Peninsula	Peninsula.
Quinn Stone and Ore Co., Ltd	1500 Alworth Bldg., Duluth, Minn	Fort William.
Robertson and Mutchmore	Gananoque	Leeds Co
BRITISH COLUMBIA—		
B.C. Monumental Works, Ltd	199-8th Ave., E. Vancouver	Granite Island.
Cascade Rock and Gravel Co., Ltd	False Creek, Vancouver	Burrard Inlet.
Coast Quarries, Ltd	837 Hastings St. W., Vancouver	Burrard Inlet.
Gilley Bros	902 Columbia St. W., New Westminster.	Coquitlam.
Nelson Granite and Monument Co	Box 865, Nelson	Nelson.
Prince Rupert City	Prince Rupert	Prince Rupert.
Vancouver Granite Co., Ltd	543 Granville St., Vancouver	Nelson Island.
Vernon Granite and Marble Co	Okanagan Landing	Yale Dist.
Western Granite Co., Inc	1005 Lloyd Bldg., Seattle	Ymir.
Wilson, James S	Sirdar	Sirdar.

Stone Quarrying Industry—Limestone

NOVA SCOTIA—		
Eastern Lime Co., Ltd	Windsor	Windsor.
Foundation Co. of Canada, Ltd	Guy and Sherbrooke Sts., Montreal	Milton.
National Trust Co., Ltd	Sydney	Point Edward.
Ross and McLellan	Iron Rock	Pictou Co.
New Brunswick—		
Peters, C. H. and Sons, Ltd	71 Dock St., St. John	Torryburn.
QUEBEC—		
Bathurst Power and Paper Co., Ltd	Bathurst, N.B	Port Daniel, Que.
Beaudry, J. Pitro	41 Rue Taché, Joliette	Joliette.
Belanger Cement Works, Ltd	4291 Delanaudière, Montreal	Rosemont.
Canada Cement Co., Ltd	Canada Cement Bldg., Montreal	Hull.
Canada Lime, Ltd	St. Marc des Carrières	St. Marc.
Charron, Arthur	Village Bélanger	Cap St. Martin.
Citadel Brick, Ltd	14 St. Joseph St., Quebec	Montmorency Co.
Cousineau, Alderic	5697 St. Urbain, Montreal	Montreal.
Delorimier and Rogers Quarries, Ltd	4901 Iverville St., Montreal	Montreal.
De Sales Quarry, Ltd	10 St. Jacques W., Montreal	De Sales.
Desormeaux, E.	Capt St. Martin	Cap St. Martin.
Deschambault Quarry Corp	52 Rue St. Paul, Quebec	Portneuf Co.

Stone Quarrying Industry—Limestone—Continued

Name	Address	Location
QUEBEC—*Concluded*		
Dominion Lime Co	East Angus, Montreal	Lime Ridge.
Dufresne Construction Co., Ltd	1832 Blvd. Pie IX, Montreal	Riv. des Prairies.
Duquette and Biron	Ville St. Michel	Ville St. Michel.
Dupré, Arthur	St. Michel	Laval Co.
Dupré Quarries, Ltd	411 Canada Cement Bldg., Montreal	St. Michel.
Durocher, Cyrille	11021 Norte Dame Est, Montreal	Montreal East.
Fuger and Smith	Pointe Claire	Pointe Claire.
Gagnon, Martin	7794 St. Andrew St., Montreal	
Gaspesian Fertilizer Co	Port Daniel East	Port Daniel East.
Gauthier, Olivier	St. Marc des Carrières	St. Marc.
Giffard, Quarry, Ltd	Giffard	Giffard.
Gingras and Bros., Ltd	St. Marc des Carrières	St. Marc.
Gravel, Ed. L	Chateau Richer	Chateau Richer.
Guilbault, Aldine and Fils	8851 St. Lawrence Blvd., Montreal	Terrebonne Rd.
Guilbault Frères and Co	St. Elizabeth	St. Elizabeth.
Harbour Commission, Montreal	Montreal	Montreal.
Kennedy Construction Co., Ltd	407 McGill St., Montreal	St. François de Sales, Acton Vale.
Lacouline, L	Chateau Richer	Chateau Richer.
Legace, Napoleon	12 Rue Mon Repos, L'Abord à Plouffe.	Rang St. Martin.
Lapointe, Emile	St. Dominique	St. Dominique.
Lapointe, Joseph	12034 Lachapelle, Montreal	Cartierville.
Laval Quarry Co., Ltd	Cap St. Martin	Cap St. Martin.
Lecrenier, V	8369 St. Denis, Montreal	Cap St. Martin.
Leduc, Edouard	St. Joachim	
Levesque, Armand	Roberval	Roberval.
Lyall, P. and Sons Co., Ltd	701 Transportation Bldg., Montreal	
Maisonneuve Quarry Co., Ltd	4740 Iberville, Montreal	Rosemont.
Martineau and Fils, Ltd	515 Marie Anne Est, Montreal	Montreal.
McCarthy, W. A	104 St. John St., Quebec	Chateau Richer.
Miner, R. H., Ltd	7411 Delanaudière St., Montreal	St. Laurent.
Montreal Cottons, Ltd	Valleyfield	Valleyfield.
Neuville Quarry, Ltd	Neuville	Portneuf Co.
Noel, Oscar and Co	41 Leduc, Hull	Wrightville.
Pagé, Jos	Charlesbourg	Charlesbourg W.
Paquette, Lévis and Co	Cap St. Martin	Capt St. Martin.
Paquette, Damien	Village Bélanger	Cap St Martin.
Quarries, Ltd	1253 McGill College Ave., Montreal	St. Vincent de Paul.
Roads Department, Quebec	Parliament Bldgs., Quebec	
St. Laurent Quarre, Ltd	Cap St. Martin	Cap St. Maritn.
St. Louis, Quarry	St. Louis de Champlain	St. Louis de France.
St. Michel Quarry, Ltd	St. Michel de Laval	Montreal.
St. Vincent de Paul Penitentiaries	Dept. Justice, Ottawa	St. Vincent de Paul.
St. Viateur, Clercs	1145 Ave. St. Viateur, Outremont.	Joliette.
Shawinigan Chemical, Ltd	83 Craig St. W., Montreal	Bedford.
Standard Lime Co., Ltd	Joliette	Joliette.
Stone and Quarry, Ltd	1340 Rue Bellechasse, Montreal	Montreal.
Tremblay, Nap	Rue Joffre, Hull	Hull.
Valleyfield, City	Valleyfield	Valleyfield.
Varin and Barbin, Ltd	St. Michel de Laval	St. Michel
Verreault, Elz., Ltd	194 Rue du Pont, Que	Giffard.
Villeray Quarry Co., Ltd	4740 Iberville, Montreal	Montreal.
Wallace Sandstone Quarries, Ltd	132 St. James St., Montreal	Philipsburg.
West End Quarry, Ltd	Troye and Decelles Sts., Montreal	Montreal.
White Grit Co	Hurdman Rd., Ottawa	Portage du Fort.
Wright Builders Supply, Ltd	250 Catherine St., Ottawa	Hull.
ONTARIO—		
Beachville Lime and Stone Co	Paris	Oxford Tp.
Billie, Chas. V	510 Oxford Ave., Montreal	Meath.
Bolender Bros	Haliburton	Haliburton.
Bourgie, J. B	Embrun	Russell Co.
Brulé, E. D. and Sons, Ltd	Billings Bridge	Ottawa.
Brunner-Mond Canada, Ltd	501 Dominion Bank Bldg., Toronto	Anderdon Tp.
Canada Cement Co., Ltd	Canada Cement Bldg., Montreal	Belleville.
Canada Crushed Stone Corp., Ltd	76 Sun Life Bldg., Hamilton	Dundas.
Cartmell, Ellen, Estate	Box 383, Thorold	Thorold.
Cloutier and Grenon	Casselman	Limoges.
Code, W. Harry	26 Cornelia St., Smith Falls	Leeds Co.
Coldwater Crushed Stone, Ltd	Coldwater	Simcoe Co.
Dagg, J. G., Estate	Kleinburg	Kleinburg.
Dominion Stucco Co., Ltd	St. Boniface, Man	Silver Mountain.
Foster, R. R	278 Echo Drive, Ottawa	Ottawa.
Gordon Crushed Stone Co., Ltd	239 Confederation Life Bldg., Toronto.	Hagersville.
Grenville Crushed Rock Co., Ltd	917 Keefer Bldg., Montreal	Oxford Mills.
Gypsum, Lime and Alabastine Co	Paris	Halton Co.
Hagersville Contracting Co., Ltd	Sun Life Bldg., Hamilton	Walpole Tp.
Henniger, M. G	Smith Falls	Carlton and Lanark.
Innerkip Quarries, Ltd	Innerkip	Oxford Co.
Irvine, Edgar Co., Ltd	Alexandria	Prescott Co.
Kingston Penitentiary	Portsmouth	Portsmouth.
Kirkfield Crushed Stone, Ltd	Fleet St., Toronto	Kirkfield.
Law Construction Co., Ltd	225 Sterling Road, Toronto	Grey Co.
Limestone Products, Ltd	Excelsior Life Bldg., Toronto	North Orillia.
Longford Crushed Stone, Ltd	Box 198, Orillia	Orillia.

Stone Quarrying Industry—Limestone—Concluded

Name	Address	Location
ONTARIO—*Concluded*		
McGinnis and O'Connor	Kingston	Barriefield.
McHay, Alex	1994—9th Ave. E., Owen Sound	Owen Sound.
McQuigge, J. R	Arnprior	Ramsay Tp.
Noranda Mines, Ltd	804 Royal Bank Bldg., Toronto	Haileybury.
Ontario Highway Dep't	Toronto	
Ontario Reformatory	Guelph	Wellington Co.
Orser, S. H	Sydenham	Sydenham.
Owen Sound City	City Hall, Owen Sound	Owen Sound.
Pembroke, Town of	Pembroke	Pembroke.
Pirson, John	Stevensville	Stanford Tp.
Puslinch Quarry, Ltd	Sun Life Bldg., Hamilton	Wellington Co.
Queenston Quarries, Ltd	Sun Life Bldg., Hamilton	Niagara Tp.
Quinton, W. G	Jasper	Jasper.
Robillard, H. and Son	195 Nicholas St., Ottawa	Gloucester Tp.
Routly, H. T	9 Richmond St. E., Toronto	Carleton-Stormont Cos.
Walker Bros	Box 586, Thorold	Welland Co.
Wallace, R. and Son	142 Patrick St., Kingston	Kingston.
Wehman, John	251 Division St., Kingston	Kingston.
Wentworth Quarries, Ltd	76 Sun Life Bldg., Hamilton	Saltfleet Tp.
Welland Ship Canal	Welland	
Wilford, F. R. and Co., Ltd	Lindsay	Collingwood.
Windmill Point Crushed Stone Co	225 Sterling Rd., Toronto	Ridgeway.
MANITOBA—		
Gillis Quarries, Ltd	Spruce and Richard Ave., Winnipeg	Garson.
Moosehorn Lime Co., Ltd	214 Avenue Bldg., Winnipeg	Moosehorn.
Tyndall Quarry Co., Ltd	1591 Erin St., Winnipeg	Garson.
Western Stone Co., Ltd	Confederation Life Bldg., Winnipeg	Garson.
Winnipeg City	City Hall, Winnipeg	Stoney Mountain.
Winnipeg Supply and Fuel Co	214 Avenue Bldg., Winnipeg	Stonewall.
ALBERTA—		
Summit Lime Works	Box 273, Lethbridge	Lethbridge.
BRITISH COLUMBIA—		
Beale Limestone Quarries	Bella-Bella	Cunningham Island.
Pacific Lime Co., Ltd	744 Hastings St. W., Vancouver	Texada Island.
Powell River Co., Ltd	Powell River	Texada Island.
Priore and Vaunucchi	Trail	Fife.
Rosebank Lime Co	744 Hastings St. W., Vancouver	Esquimalt.
Walleen, J. J	Port Alice	Quatsino Sd.

Stone Quarrying Industry—Marble

NOVA SCOTIA—		
Brandram-Henderson, Ltd	Montreal	Whycocomagh.
QUEBEC—		
Brassard, Ovide	L'Annonciation	L'Annonciation.
Wallace Sandstone Quarries, Ltd	132 St. James St., Montreal	Philipsburg.
ONTARIO—		
Hodge and Son	Bancroft	Bancroft.
MANITOBA—		
Hudson Bay Marble and Granite Quarries, Ltd	The Pas	Hudson Bay Railway.
Manitoba Marble Quarries, Ltd	408 McArthur Bldg., Winnipeg	Cormorant.
BRITISH COLUMBIA—		
Canadian Marble and Granite Works, Ltd	10702—101st. St., Edmonton, Alta.	Marblehead.

Stone Quarrying Industry—Sandstone

NOVA SCOTIA—		
Wallace Sandstone Quarries, Ltd	132 St. James St., Montreal	Wallace.
NEW BRUNSWICK—		
Miramichi Quarry Co	Quarryville	Quarryville.
QUEBEC—		
Blais, Jos. Enrg	10 Ave. Mont Marie, Levis	St. Nicholas.
Bourbonnais, J. A	Vaudreuil Sta	Vaudreuil.
Canadian Rock Products, Ltd	2020 Union Ave., Montreal	Montmagny Co.
Faubert, Alphonse	Ville de Levy	Ville de Levy.
Gagnon, L. P	St. David	St. David.
Montmagny, Ville de	Montmagny	St. Thomas.
Northern Construction Co., Ltd	605 Confederation Bldg., Montreal	Victoria.
Sherbrooke City	Sherbrooke	Canton Ascot.
Vezina, Jos	St. Foy, Quebec	St. Foy.
ONTARIO—		
Credit Valley Quarries, Ltd	C.N.R. Florence St., Toronto 3	Glen William's.
ALBERTA—		
Oliver, Wm	1823—16th St. W., Calgary	Calgary.
BRITISH COLUMBIA—		
Cranbrook City	Cranbrook	Cranbrook.
McDonald, J. A. and C. H., Ltd	1571 Main St., Vancouver	Newcastle Island.

APPENDIX ONE

EXPLANATORY NOTES

Method of Computing Quantities and Values on the Mineral Production of Canada.

Antimony.—Recoverable metal in shipments made valued at the average New York price for fine metal.

Arsenic.—(a) Recoverable arsenic in concentrates exported at an arbitrary value; (b) white arsenic shipped from Canadian smelters at its sales value.

Bismuth.—(a) Recoverable metal in silver-lead-bismuth bullion shipped to foreign smelters for refining at an arbitrary value; (b) Bismuth metal produced at Canadian smelters valued at the average New York price for the year.

Cadmium.—Smelter production valued at the average New York price for the year.

Cobalt.—Cobalt content of the various cobalt products sold by Ontario smelters added to the cobalt content of ores and residues exported for treatment in foreign smelters; the value given is the net amount received by the shippers.

Copper.—(a) Recoverable copper in ores and concentrates exported added to the copper in blister copper made at Canadian smelters valued at the average New York price for electrolytic copper; (b) Copper in matte exported from Canadian smelters valued at an arbitrary rate agreed upon between the Dominion Bureau of Statistics and the Ontario Department of Mines.

Gold.—Gold in bullion produced and the recoverable gold in all other Canadian mine products valued at the standard rate of $20.671834 per fine ounce.

Iron Ore.—Export tonnages at sales value.

Lead.—(a) 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, the English quotations being converted to Canadian funds at par ($4.86666). (b) Sales from the smelter of the Kingdon Mining, Smelting and Manufacturing Co., Ltd., Galetta, Ontario.

Molybdenite.—Shipments in terms of MoS^2 at their sales value.

Nickel.—(a) Refined and electrolytic nickel produced at Canadian refineries valued 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 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).

Platinum group metals.—Recoverable metals in smelter products at their sales value to the producer and placer platinum at the average New York price for the year.

Silver.—Silver bullion produced and the recoverable silver in other smelter products, and the recoverable silver in Canadian ores exported, at the average New York price for the refined metal.

Zinc.—Refined zinc produced at Trail and the recoverable zinc in concentrates exported, valued at the average monthly price quoted in London, exchange conversion being made at par.

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 of 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. of similar goods are not made or produced in the United Kingdom, the value stated is the value If 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.

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LIST OF PUBLICATIONS

PREPARED IN THE

MINING, METALLURGICAL AND CHEMICAL BRANCH DOMINION BUREAU OF STATISTICS

STATISTICS OF MANUFACTURES—based chiefly on minerals.

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Annual Printed Reports—

Iron and Steel and Their Products: Pig Iron and Ferro-Alloys—Steel and Rolled Products — Castings and Forgings — Boilers, Tanks and Engines — Agricultural Implements — Machinery — Automobiles—Auto Accessories—Bicycles—Railway Rolling Stock—Wire and Wire Goods—Sheet Metal Products—Hardware and Tools—Miscellaneous Iron and Steel Products, n.e.s.

Manufactures of Non-Ferrous Metals: Aluminium Products—Brass and Copper Products—Lead, Tin and Zinc Products—Jewellery and Silverware—Electrical Apparatus and Supplies—Miscellaneous Non-Ferrous Metal Products—Non-Ferrous Smelting and Refining.

Manufactures of Non-Metallic Minerals: Aerated Waters—Asbestos Products—Cement—Cement Products—Coke and Gas—Glass (blown, cut, ornamental, etc.)—Lime—Petroleum Products—Products from Domestic Clays—Products from Imported Clays—Salt—Sand-Lime Brick—Stone Dressing—Artificial Abrasives and Abrasive Products—Miscellaneous Non-Metallic Mineral Products, including (*a*) Artificial Graphite and Electrodes, (*b*) Gypsum Products, (*c*) Mica Products, (*d*) Magnesite Products, (*e*) Non-Metallic Mineral Products, n.e.s.

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Monthly—

Production of Iron and Steel in Canada.
Coal and Coke Statistics for Canada.
Automobile Statistics for Canada.

SPECIAL REPORTS—

Report on the Consumption of Prepared Non-Metallic Minerals in Canada.
Report on the Consumption of Mine and Mill Materials in Canada.
Report on the Consumption of Coke in Canada.
Annual Summary Report on the Mineral Industry and the Manufacturing Industries Related Thereto.
The Fertilizer Trade in Canada, July 1, 1929-June 30, 1930.

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