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MINING OPERATIONS AND STATISTICS, PART A

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Énergie et Ressources
naturelles

Québec 

PROVINCE OF QUEBEC, CANADA
Department of Mines and Fisheries

Honourable ONÉSIME GAGNON, Minister

L.-A. RICHARD, Deputy-Minister

BUREAU OF MINES

A.-O. DUFRESNE, Director

ANNUAL REPORT
OF THE
QUEBEC BUREAU OF MINES
FOR THE CALENDAR YEAR
1936

PART A

Mining Operations and Statistics



QUEBEC
PRINTED BY R. PARADIS
PRINTER TO HIS MAJESTY THE KING

1937

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PREFATORY NOTE

In the statistical tables, and in the review of the mining industry of the Province during the year, the term "production" is synonymous with "quantity sold, shipped, or used", and does not necessarily represent "output". The ore and other mineral products remaining as "stock on hand" at the end of the year are not included in the production figures.

Unless otherwise stated, the ton used throughout is that of 2,000 pounds, and the year referred to is the calendar year, ending December 31st. Values are given in Canadian funds.

The present report was preceded on March 4th by a statistical statement, giving provisional figures of production, subject to revision. The figures in the present volume supersede the provisional ones.

The Annual Report of the Bureau of Mines for 1936 is published in several parts, of which this volume is Part *A*. It is followed by Parts *B*, *C*, *D*, and *E*, which consist of geological reports with accompanying maps.

QUEBEC BUREAU OF MINES,
DEPARTMENT OF MINES AND FISHERIES,
JUNE, 1937

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MINING OPERATIONS

IN THE

PROVINCE OF QUEBEC

DURING THE YEAR 1936

GENERAL REVIEW

The general improvement in economic conditions, already evident in 1935, continued throughout 1936, and was particularly notable in the mining industry. This is well illustrated by the mineral production of the Province of Quebec, which reached the all-time record value of \$49,755,985, 27 per cent higher than in 1935, when the production had a value of \$39,141,734, and 7 per cent above the previous peak of \$46,454,820, attained in 1929.

As shown in the accompanying table, substantial increases were registered in both 'metallics' and 'non-metallics', but 'building materials' barely held their own as compared with 1935, with a value that was little more than one-third of the record 1929 total of \$18,534,165.

SUBDIVISION OF QUEBEC'S MINERAL PRODUCTION
FOR THE YEARS 1932-1936

YEAR	METALS	%	NON-METALLICS	%	BUILDING MATERIALS	%
1932 ...	\$13,914,089	54	\$3,671,634	14	\$8,097,343	32
1933 ...	16,360,011	58	6,043,308	22	5,761,221	20
1934 ...	19,258,094	61	6,579,453	21	5,473,205	18
1935 ...	23,804,792	61	8,824,178	22	6,512,764	17
1936 ...	30,643,787	62	12,388,178	25	6,724,020	13

TABLE OF ANNUAL VALUE OF MINERAL PRODUCTION
SINCE 1898

YEAR	VALUE	YEAR	VALUE
1898	\$1,673,337	1917	\$16,189,179
1899	2,083,272	1918	18,707,762
1900	2,546,076	1919	20,813,670
1901	2,987,731	1920	28,392,939
1902	2,985,463	1921	15,522,988
1903	2,772,762	1922	18,335,153
1904	3,023,568	1923	21,326,314
1905	3,750,300	1924	18,952,806
1906	5,019,932	1925	23,824,912
1907	5,391,368	1926	25,740,002
1908	5,458,598	1927	29,124,110
1909	5,552,062	1928	37,325,237
1910	7,323,281	1929	46,454,820
1911	8,679,786	1930	41,158,740
1912	11,187,110	1931	36,051,366
1913	13,119,811	1932	25,683,066
1914	11,732,738	1933	28,164,540
1915	11,765,873	1934	31,310,752
1916	13,287,024	1935	39,141,734
		1936	49,755,985

Of the \$10,614,251 increase in value of production during 1936 as compared with 1935, \$9,706,773 was due to two items—gold and asbestos. The latter industry staged a remarkable recovery during the year.

As indicating that the improved conditions in the mining industry of the Province are being well maintained, it is gratifying to note that, for the first three months of 1937, gold production was 16.6 per cent higher, and shipments of asbestos fibre advanced 62 per cent, as compared with the corresponding period in 1936.

TABLE OF THE MINERAL PRODUCTION OF
THE PROVINCE OF QUEBEC DURING 1936

SUBSTANCE	No. OF WORKMEN	WAGES	QUANTITY	VALUE in 1936	VALUE IN 1935
		\$		\$	\$
METALLICS					
Chrome, tons.....	2	140	545	8,508	5,371
Copper, lb.....	1,870	2,666,447	66,340,175	6,287,058	6,162,350
Gold, oz.....	5,140	5,556,902	666,905	23,361,682(1)	16,558,478 (1)
Lead, lb.....			2,047,689	80,126	64,156
Molybdenite.....	5	508			
Selenium, lb.....			168,417	298,098	396,328
Silver, oz.....			724,339	326,872	433,338
Tellurium, lb.....			19,502	34,519	3,416
Titaniferous iron ore, tons.....	20	947	2,566	18,318	16,400
Zinc, lb.....	219	99,780	6,896,123	228,606	164,955
Assessment work on claims.....	662	659,033			
Sub-totals.....	7,918	\$8,983,757		\$30,643,787	\$23,804,792
NON-METALLICS					
Asbestos, tons.....	2,829	2,307,060	301,287	9,958,183	7,054,614
Feldspar, tons.....	71	19,553	8,115	75,703	63,075
Garnet.....	2	408			
Graphite.....					1,281
Industrial lime, tons.....	260	160,767	121,654	630,436	587,680
Industrial limestone, tons.....			135,554	149,909	144,236
Kaolin.....					1,520
Magnesitic dolomite.....	204	239,942		768,742	486,084
Marl, tons.....			27,186	10,874	12,325
Mica, lb.....	118	37,366	544,214	63,123	74,894
Mineral water, gals.....	13	2,805	131,186	17,399	15,113
Ochre and iron oxide, tons.....	59	26,489	5,458	65,630	75,388
Peat, tons.....	21	2,180	295	7,106	2,958
Phosphate, tons.....	8	1,776	525	4,927	1,043
Pyrite, tons.....			86,919	282,743	47,779
Quartz and industrial sand, tons.....	129	75,003	78,975	320,634	224,135
Talc and soapstone.....	33	11,391		32,769	32,053
Sub-totals.....	3,747	\$2,884,740		\$12,388,178	\$8,824,178
BUILDING MATERIALS					
Building lime, tons.....			11,404	87,341	88,981
Building limestone, tons.....	1,124	382,598	1,114,275	915,475	943,145
Cement, barrels.....	359	439,410	2,093,130	2,945,074	2,472,008
Clay products:					
Brick, M.....			33,582	516,248	439,143
Other products.....	680	228,166		175,517	152,499
Granite, tons.....	616	232,808	137,910	429,281	800,685
Marble, tons.....	73	48,581	6,091	120,582	31,071
Sand and gravel, tons.....	2,945	720,247	5,490,280	1,418,231	1,442,468
Sand-lime brick, M.....	9	1,476	1,267	13,029	19,226
Sandstone, tons.....	167	48,829	92,094	102,056	121,864
Slate and shale, tons.....	8	60	937	1,186	1,674
Sub-totals.....	5,981	\$2,102,175		\$6,724,020	\$6,512,764
TOTALS.....	17,646	\$13,970,872		\$49,755,985	\$39,141,734

(1) Value in Canadian funds. The value at the standard rate of \$20.671834 amounts to \$13,786,149 for 1936 and \$9,727,028 for 1935.

There was a marked increase in prospecting activity during the year, and new records were established in the number of mining claims staked and of miners' certificates sold. The actual numbers were, respectively, 17,503 and 5,471, as compared with 11,995 claims and 3,495 certificates in 1935. Moreover, this keen interest in our mineral resources continues unabated, with the figures for the first three months of 1937 showing a very appreciable advance over those for the corresponding period of 1936.

Staking of claims, and exploration and development of mining properties, were particularly active in Western and Northern Quebec.

In the Rouyn-Harricana region, whence comes most of our production of metals, some mines formerly producing but which had been closed down were reopened during the year; several others were brought into production. Details of these activities, and of other mining operations in the region, are given in the report of R. H. Taschereau, Inspector of Mines (see pages 49-82).

In the Madeleine Lake region, underground work was carried on continuously on the property of *Lake Rose Mines, Limited*—a subsidiary of Prospectors Airways Company, Limited—in Currie township; and in Desjardins township, adjacent to Currie, the *Florence River Gold Mines* property was explored by diamond drilling.

In the Opemisca region, an extensive programme of diamond drilling was carried out on the *Opemiska Copper Mines* property, in Levy township, and the three-compartment shaft, begun in March, 1936, was sunk to a depth of 545 feet.

In Chibougamau, the *Consolidated Chibougamau Goldfields* property, on Cedar bay, in McKenzie township, was explored by diamond drilling. A large number of holes, aggregating 14,711 feet, were drilled. Of this total, 12,000 feet was in holes started from underground workings and the balance, some 2,700 feet, in holes drilled from the surface.

In Obalski township, surface exploration and sampling were done on a group of claims on which considerable work had been performed in 1928 and 1929; and on Merrill island, in this township, some diamond drilling was carried out by the *Consolidated Mining and Smelting Company*.

The *Mining Corporation of Canada* took an option on the Rangely-Wolson group of claims in McKenzie township, adjacent to the Barlow-McKenzie township line. They completed a large amount of trenching and 2,000 feet of diamond drilling between March and August, 1936. The option was subsequently abandoned. McIntyre Porcupine Mines had previously done 7,000 feet of diamond drilling on this property in 1935.

Wawbano Mines, Limited, had a geophysical survey made of Portage island, in Roy township, on which they took an option. In 1935, the Consolidated Chibougamau Goldfields had put down 18 diamond-drill holes on this property.

In Scott township, *O'Leary Malartic Mines* did 1,000 feet of diamond drilling on the Ramsay group of claims; and other interests put down six diamond-drill holes on the William Lake group.

METALS

Metals produced from Quebec ores during 1936 had a total value of \$30,643,787. This is an increase of no less than 30 per cent as compared with the previous year. Until 1927, when production from mines in Western Quebec commenced, the value of the metal output had never reached two million dollars. Each year since then has seen a new record established. Even within the past five years, the annual value of our metal production has more than doubled.

For the year under review, metals represent 62 per cent of the total value of the mineral production of the Province, with gold alone accounting for 47 per cent—both figures constituting records.

The average price of gold for the year, in Canadian funds, was \$35.03 per ounce, fine metal, as compared with \$35.19 per ounce in 1935.

Base-metal prices continued to improve during the year. The monthly average price of copper rose from 9.025 cents per pound in January to 10.763 cents in December on the New York market, and from £36.788 per long ton to £50.364 on the London market. During the first quarter of 1937, further substantial advances were recorded. As shown in the accompanying table, there was an appreciable increase also in the market price of both lead and zinc as compared with 1935.

AVERAGE YEARLY PRICES OF BASE-METALS, 1931-1936

(Figures from Report of Dominion Bureau of Statistics)

METAL	MARKET	UNIT	1931	1932	1933	1934	1935	1936
Copper.....	{ New York....	Cents per lb.....	8.116	5.555	7.025	8.428	8.649	9.474
	{ Montreal....	.....	10.006	7.516	8.684	8.220	8.488	10.070
	{ London.....	£ per long ton.....	42.093	35.962	36.359	33.319	35.430	42.650
Lead.....	{ New York....	Cents per lb.....	4.168	3.511	3.705	3.409	3.925	4.710
	{ Montreal....	.....	4.243	3.180	3.636	3.860	4.065	4.642
	{ London.....	£ per long ton.....	12.958	11.913	11.670	10.935	14.238	17.599
Zinc.....	{ Saint Louis...	Cents per lb.....	3.640	2.876	4.029	4.158	4.328	4.901
	{ Montreal....	.....	3.961	3.724	4.488	4.059	3.992	4.153
	{ London.....	£ per long ton.....	12.215	13.545	15.666	13.657	14.082	14.920

NOTE.—The London prices for 1936 transposed into Canadian funds in cents per pound were: copper, 9,477; lead, 3,913; and zinc, 3,315.

METAL PRODUCTION OF WESTERN QUEBEC, 1927-1936

YEAR	ORE MILLED (Tons)	SHIPMENTS						VALUE \$
		COPPER (Pounds)	GOLD (Ounces)	SILVER (Ounces)	ZINC (Pounds)	SELENIUM (Pounds)	TELLURIUM (Pounds)	
1927....	7,570	463,471	741	2,611	.....	.....	.....	76,674
1928....	271,614	33,019,311	53,397	185,579	.....	.....	.....	6,022,692
1929....	498,280	51,101,054	86,162	333,792	.....	.....	.....	11,210,882
1930....	980,419	75,435,415	141,747	555,578	9,754,160	.....	.....	13,286,327
1931....	1,100,121	62,018,221	299,869	509,571	.....	.....	.....	11,814,979
1932....	1,331,104	60,584,116	401,005	605,258	.....	.....	.....	13,472,311
1933....	1,886,617	83,417,206	382,834	451,732	.....	22,131	.....	15,864,182
1934....	2,436,233	69,057,942	390,061	455,022	.....	48,764	.....	18,869,825
1935....	8,809,654	74,471,124	469,560	504,985	.....	206,421	1,708	23,056,076
1936....	3,390,412	62,746,930	665,930	556,745	.....	168,417	19,502	29,857,913
TOTAL..	14,712,024	552,314,790	2,891,306	4,160,873	9,754,160	445,733	21,210	\$143,531,861

Gold, which again held first place in our mineral production, accounted for 76 per cent of the total value of metal output. Copper contributed about 20 per cent. As compared with 1935, gold shows increases both in quantity and in value. There was some decline in copper output, but the value was higher than in 1935 owing to the better prices obtaining for the metal. Higher prices also accounted for an appreciable increase in value of the lead output, although the quantity produced remained almost exactly the same as in the previous year. As regards other metals, increases both in quantity and value were recorded for zinc, chrome, tellurium, and titanium ore; for silver there was a higher production but with lower total value; and for selenium there was a decrease in both quantity and value.

DIVIDENDS PAID BY
MINING COMPANIES OPERATING IN WESTERN QUEBEC
(TO JANUARY 1ST, 1937)

COMPANY	AUTHOR- IZED CAPITAL (shares)	DATE OF FIRST DIVIDEND	DIVIDENDS, 1936		TOTAL DIVIDENDS (To end of 1936)
			TOTAL	RATE PER SHARE	
Noranda Mines, Limited.....	2,250,000	Jan. 2nd, 1930	\$ 6,719,316.00	\$ 3.00	\$ 28,699,949.13
Siscoe Gold Mines, Ltd.....	5,000,000	March 31st, 1932	970,012.92	0.21	3,963,468.26
McWatters Gold Mines, Ltd..	2,000,000	Dec. 18th, 1935	186,050.60	0.10	279,075.90
Beattie Gold Mines, Ltd.....	5,000,000	June 1st, 1936	239,619.20	0.05	239,619.20

NON-METALLICS

In 1936, the production of non-metallic minerals, now commonly designated industrial minerals, had a total value of \$12,388,178, as compared with \$8,824,178 in 1935, an increase of \$3,564,000, or 40 per cent. The recovery of the asbestos market, as regards both demand and prices, is responsible for nearly \$3,000,000 of this improvement, while magnesitic-dolomite contributed \$283,000 and pyrite \$235,000.

Small increases in value are also recorded for feldspar, industrial lime, mineral water, phosphate, quartz and industrial sand, and soapstone.

White arsenic (arsenious oxide) is now being produced as a by-product at the roasting plant of *O'Brien Gold Mines, Limited*, in Cadillac township, from the treatment of gold ores carrying arsenopyrite. At present, it is being stocked at the plant, awaiting an outlet. Consequently, arsenic does not appear in our table of mineral production for 1936. *Beattie Gold Mines*, also, have commenced erection of a roaster to treat their arsenical concentrate, from which the gold cannot be recovered by cyanidation. This plant is expected to start production of white arsenic on a large scale in the fall of 1937.

In connection with possible markets for white arsenic, the following extract from *Mineral Trade Notes* (United States Bureau of Mines, November 1936) is of interest :

"The Boliden Mining Co., seeking an outlet for its accumulated arsenic stocks, has found that the impregnation of arsenic in lumber prevents decay caused by fungus growth. As a result,

the Company has a plant in operation at Kagghamra Gard, in Sodertorn, engaged in the impregnation of electric telegraph and telephone poles. Another plant at Lulea, the Luossavaara-Kirunavaara AB, a subsidiary to Trafik AB, Grangesberg-Oxelosund, Stockholm, is engaged in the impregnation of lumber.

“Certain private railway companies have tested railway sleepers impregnated with the arsenic by-product. Experiments have also given evidence that wood or lumber impregnated with arsenic prevents damage caused by ship-worms. It is expected that arsenic-treated lumber will be used for outer constructions and roof-beams in houses. The Royal Board of Roads and Water Constructions tried spraying wooden poles with a compound of arsenic-concrete, but found this method more expensive than impregnation”.

BUILDING MATERIALS

The building industry showed but slight improvement during 1936. As a consequence, production of mineral building materials continued at a low ebb, the total value being \$6,724,020, as compared with \$6,512,764 in 1935, an increase of only $3\frac{1}{4}$ per cent. This corresponds closely with the increase in number of building permits issued during the year, which was slightly less than 3 per cent higher than for the previous year. A substantial decrease in the production of limestone, granite, and sandstone was compensated by higher figures for cement and clay products.

The building industry has been under a cloud since the beginning of the period of economic depression which started in 1930. Reflecting these conditions, we find that, from a peak of \$18,500,000 in 1929, the value of mineral building materials produced in Quebec fell to \$5,500,000 in 1934, and since that time little of the lost ground has been regained. There is a dearth of low and medium price residences, but apparently capital is hesitating to venture into the building industry in urban centres, owing to the ever-mounting debts of municipalities and governments, resulting mainly from unemployment relief measures. This has been a major economic problem for the past six or seven years, as it has necessitated a marked increase in taxation.

For the first four months of 1937, the production of cement has been 22 per cent higher than for the corresponding period of 1936, indicating a slight improvement in the building industry.

MINING RIGHTS

The accompanying tables, prepared by J.-X. Mercier, chief of the Administrative Division, give the number of mining titles issued by the Bureau of Mines during the fiscal year 1935-36, ending June 30th, and a statement of the assessment work done on the claims and under mining licenses. Robert Samson, accountant, compiled the statement relating to revenue.

NUMBER OF VARIOUS TITLES ISSUED
BY THE BUREAU OF MINES, 1934-36

(Fiscal years)

DESIGNATION OF TITLE	FISCAL YEAR 1934-35	FISCAL YEAR 1935-36
Claims recorded, Amos.....	5,338	5,995
" " Noranda.....	4,351	3,964
" " Quebec.....	1,708	3,403
Miners' certificates issued.....	3,395	4,043
Mining licenses issued.....	537	525
renewed.....	1,143	1,215
Mining concessions.....	0	5
Transfer of mining rights.....	987	1,078
Reports of work, days reported.....	538,362	528,202
Reports of work, diamond drilling, ft.....	145,107	127,784

TITLES ISSUED YEARLY SINCE 1920-21

(Fiscal years)

FISCAL YEAR	NUMBER OF MINERS' CER- TIFICATES	NUMBER OF CLAIMS RE- CORDED	NUMBER OF MINING LI- CENSES	MINING CONCESSIONS		TRANSFER OF MINING RIGHTS
				NUMBER	ACRES	
1920-21.....	493	335	212	5	464	41
1921-22.....	509	321	195	4	801	33
1922-23.....	1,973	1,183	238	8	602	210
1923-24.....	1,928	1,750	635	9	1,517	430
1924-25.....	2,339	5,143	1,045	17	3,698	729
1925-26.....	3,315	9,407	1,074	8	1,733	1,152
1926-27.....	3,799	12,686	1,467	33	7,249	1,155
1927-28.....	4,090	13,707	2,290	20	6,640	1,227
1928-29.....	3,086	9,544	2,177	16	5,803	839
1929-30.....	2,500	8,245	1,607	2	1,049	640
1930-31.....	1,981	6,034	1,341	3	967	855
1931-32.....	2,324	8,108	906	4	1,940	425
1932-33.....	3,178	11,211	1,065	4	2,578	908
1933-34.....	3,022	10,915	1,557	4	2,627	940
1934-35.....	3,395	11,397	1,680	9	3,541	987
1935-36.....	4,043	12,962	1,770	5	2,233	1,078

COMPARATIVE STATEMENT OF EXPLORATION WORK PERFORMED ON CLAIMS
AND MINING LICENSES, 1931-1936

(Calendar years)

CALENDAR YEAR	NUMBER OF DAYS' WORK	FOOTAGE OF DIAMOND- DRILL HOLES
1931.....	124,050	23,486
1932.....	184,815	44,873
1933.....	263,900	49,899
1934.....	500,502	123,357
1935.....	542,094	146,425
1936.....	730,295	202,623

COMPARATIVE STATEMENT OF REVENUE COLLECTED BY THE BUREAU
OF MINES, 1933-1936
(Fiscal years)

	FISCAL YEAR 1933-34	FISCAL YEAR 1934-35	FISCAL YEAR 1935-36
	\$	\$	\$
Miners' certificates.....	30,405.00	34,440.00	39,185.00
Mining licenses.....	158,051.00	170,434.79	174,306.51
Mining concessions.....	14,016.60	28,581.45	5,550.96
Transfer of titles.....	9,400.00	9,870.00	10,780.00
Dues on mining concessions.....	1,976.92	2,026.68	1,742.77
Dues on village lots.....	9,405.39	5,677.13	16,701.25
Dues on profits of mines.....	321,276.02	370,895.26	619,341.70
Miscellaneous:			
Sale of maps.....	983.98	1,371.77	1,604.17
Sale of mineral collections.....	352.75	618.00	681.86
Fees for analyses.....	323.13	1,042.55	3,445.82
Casual revenue.....	2,009.23	32.35	.....

GEOLOGICAL FIELD WORK

Since 1929, when the Division of Geology was organized, the Quebec Bureau of Mines has greatly expanded its programme of geological field work. Systematic studies are made of the geology of areas favourable to mineralization and of the known mineral deposits they contain. From these examinations, maps and reports are prepared to assist and guide prospectors in the search for useful minerals. During the field season of 1935, the following regions were examined by geologists under the general direction of Dr. John A. Dresser. The results of these operations are presented in reports, maps, plans, and illustrations, in parts *B*, *C*, *D*, and *E* of the Annual Report of the Bureau.

Geological reports included in the Annual Report for 1935 are as follows:

- L. V. Bell*.....Northern Dubuisson area, Abitibi county.
- Bertrand-T. Denis*.....Guillet township, Témiscamingue county.
- I. W. Jones*.....Upper York River area, Gaspé peninsula.
- Carl Faessler*.....Headwaters of Mégiscane River area, Abitibi county.
- Abbé J.-W. Laverdière*...Marbleton and vicinity, Wolfe county
- G. S. MacKenzie*.....Currie township, Abitibi district.
- H. W. McGerrigle*.....Eastern Townships gold placer deposits.
- F. Fitz Osborne*.....Sainte-Agathe-Saint-Jovite area, Terrebonne county.
- H. M. Bannerman*.....Josselin-Delestre area, Abitibi county.
- C. K. Louther*.....Villebon-Denain area, Abitibi, Témiscamingue and Pontiac counties.

For the field season of 1936, the following fields were assigned to the geologists named. Their reports are presented in Parts *B*, *C*, *D*, and *E* of the Annual Report for 1936.

- L. V. Bell*.....Study of mining properties of the Rouyn-Bell River area, Abitibi and Témiscamingue counties. (P. R. No. 116)
- I. W. Jones*.....Saint-John River basin, Gaspesia.
- G. S. MacKenzie*.....Mines and prospects of Chibougamau, Opemisca, Father Lake, and Currie area.
- G. V. Douglas*.....Lake Kamshigama area, Abitibi district.
- W. W. Longley*.....Florence and Wedding River area, Abitibi district.
- Abbé J. W. Laverdière*...Geology of Ste-Anne River area, Portneuf county.
- Carl Faessler*.....Parent Township area, Laviolette county.
- F. Fitz Osborne*.....Mineral deposits of Grenville region, Argenteuil county.
- H. W. McGerrigle*.....Investigations of sand deposits of Bagot and Shefford counties.

In order that the results of the field work may be available to the interested public at as early a date as possible, the Bureau issues, in the fall of each year, advance reports, in mimeograph form, of the investigations carried out during the current season in areas of particular economic interest. That this service, which was commenced in the fall of 1935, is of great value to prospectors and is much appreciated by them is shown by the great demand there has been for the advance reports.

CHEMICAL RESEARCH AND ASSAY LABORATORIES

The Bureau of Mines maintains three laboratories equipped with all facilities for making analyses and assays and for carrying out general research on rocks, minerals, and ores. The main one, opened in Quebec city in 1933, was moved in December, 1936, to the Parliament Building, Annex E, St-Augustin Street; another, located at École Polytechnique, 1430 St-Denis Street, Montreal, has functioned since 1910; and the third is operated in connection with the office of the Mining Inspector at Thetford Mines.

The main laboratory, in Quebec city, serves the technical staff of the Bureau as well as the general public. In addition to assays and analyses of the thousands of samples submitted each year by prospectors, the work of the laboratory staff includes detailed quantitative chemical analyses of rocks collected by the Bureau's geologists in the course of their field work; the microscopic examination of rocks in thin section; the optical determination of minerals; and general research, not only on minerals and rocks but also on other substances and materials, as metals and alloys, mine waters, etc., with which the mining industry is concerned.

The Montreal laboratory is occupied chiefly with assays of ores and the determination of minerals and rocks submitted by prospectors in various parts of the Province.

The Thetford laboratory operates a testing machine which is the agreed standard means of classification of the various products of the asbestos mines of the district. It also undertakes to standardize the testing machines of various types, which are used at the individual asbestos mines.

STATEMENT OF LABORATORY WORK DONE DURING THE FISCAL YEAR 1935-36

	SAMPLES RECEIVED	ASSAYS AND ANALYSES	QUALITATIVE EXAMINATIONS
Bureau of Mines, Quebec.....	5,208	4,033	3,174
Ecole Polytechnique, Montreal.....	689	1,065	509
Bureau of Mines, Thetford.....	520	1,115	.....

Special work carried on during the year at the main laboratory by Maurice Archambault and Raymond Loranger included the following:

- Complete quantitative analysis of talc from Bolton.
- Analysis of eight samples of residual water from Siscoe, Sullivan, Greene-Stabell, and Lamaque mines.
- Study under the microscope of 151 samples, of which 25 were petrographic, and 126 mineralogical, determinations.
- A research on metals and alloys to determine the most suitable composition for claim-tags.

DRAUGHTING AND MAP-MAKING

The Draughting division employed four competent draughtsmen, under the direction of Marc Boyer, Mining Engineer.

The staff of this division made the maps, sketches, and drawings which accompany the Bureau's geological reports, and entered on two hundred and forty linen-mounted township maps the location of the 12,962 mining claims that were staked and recorded during the year. This work necessitated the tracing of about sixty new claim-maps of townships.

A third printing of 2,500 copies of the map showing the mining properties in Western Quebec (Map No. 335) was published during the year.

The Bureau distributed 5,918 blue-prints of maps of various townships, showing the location of mining claims.

Listed below, with their serial numbers, are the maps made during 1935-36, most of them to illustrate Parts *B*, *C*, *D*, and *E* of the Annual Report.

MAPS MADE DURING 1935-36

- 323—Dartmouth River map-area, Gaspé county.
- 324—Deschambault region, Portneuf county.
- 325—Sketch-map showing Belisle brook, Portneuf county.
- 326—Plan and section of formations on lot 207, parish of Portneuf.
- 327—Canadian-Malartic mine, main features of structure; surface and three levels.
- 330—Glacial Lake Ojibway area.
- 331—Sigma mine, north-south section through shaft.
- 332—Lamaque mine, section through No. 3 shaft.
- 333—Lamaque mine, geology of the 200-foot level.
- 334—Lamaque-Sigma mines area, Abitibi county.
- 335—Mining properties in Western Quebec.
- 336—Josselin-Delestre map-area, Abitibi county.
- 337—Currie region (preliminary), Abitibi district.
- 338—Headwaters of Mégiscane river, Abitibi county.
- 339—Northern Dubuisson map-area (preliminary), Abitibi county.
- 340—Guillet area (preliminary), Témiscamingue county.
- 341—Headwaters of Megiscane River map-area (preliminary).
- 342—Northern Dubuisson map-area, Abitibi county.
- 343—Sainte-Agathe-Saint-Jovite map-area, Terrebonne county.
- 344—Villebon-Denain map-area (preliminary), Abitibi and Pontiac counties.
- 345—Villebon-Denain map-area, Abitibi and Pontiac counties.
- 346—Index to mining districts of Quebec.
- 347—Rouyn-Bell River mining district.
- 349—Stoke Mountain area, Richmond, Sherbrooke and Compton counties.
- 350—Harriana mining district.
- 351—Glacial Lake Ojibway.
- 352—York River area, Gaspé peninsula.
- 353—Currie township, Abitibi district.
- 354—Marbleton area, Wolfe county.
- 355—Guillet township, Témiscamingue county.
- 356—Winter road, Lac Saint-Jean-Chibougamau.
- 360—Topographical map, Waswanipi-Chibougamau area.
- 371—Gold placer deposits, Eastern Townships.
- 372—Gold placer deposits on Grass Island brook, Sherbrooke county.
- 373—Gold placer deposits on Moe river, Compton county.
- 374—Gold placer deposits on Hall brook, Dudswell township.
- 375—Gold placer deposits on Rowe brook, Wolfe county.
- 376—Gold placer deposits on Kingsley brook, Dudswell township.
- 377—Schematic representation of the rocks of the Morin series.
- 378—Sketch-map of Ivry mine.
- 379—Profiles of vertical magnetic intensity at Ivry mine.
- 380—Outline of ore-bodies as suggested by magnetometer survey, Ivry mine.
- 381—Magnetic map of part of Desgrosbois ore-body.
- 382—Profiles of vertical magnetic intensity, Desgrosbois ore-body.

LECTURES TO PROSPECTORS

During the fiscal year 1935-36, the Bureau of Mines again organized courses of lectures on mineralogy for the benefit of prospectors. The classes were held at various centres and everywhere there was a numerous attendance of students, who showed great interest in the work.

The lecturers were Maurice Archambault and L. V. Bell, of the Bureau of Mines staff; Paul d'Aragon, mining engineer; Professor A. Mailhot, of l'Ecole Polytechnique, Montreal; and Professor Carl Faessler, of l'Ecole Supérieure de Chimie, Quebec.

To assist in the teaching of mineralogy, the Bureau continued the policy of distributing, at a nominal cost, collections of forty common minerals, each collection accompanied by a copy of the *Prospectors' Handbook*, and a small pamphlet entitled *Notions Élémentaires de Minéralogie*.

LECTURES TO PROSPECTORS, FISCAL YEAR 1935-36

WHERE GIVEN	NUMBER OF LECTURES	TOTAL ATTENDANCE
Amos, Abitibi.....	20	274
Authier, Abitibi.....	12	75
Barrute, Abitibi.....	12	117
La Sarre, Abitibi.....	12	86
Val d'Or, Abitibi.....	11	225
Villemontel, Abitibi.....	11	67
Eugéreville, Témiscamingue.....	12	176
Latulipe, Témiscamingue.....	9	122
Rouyn, Témiscamingue.....	38	402
Mistassini, Lac St-Jean.....	12	114
Péribonka, Lac St-Jean.....	11	45
St-Félicien, Lac St-Jean.....	12	197
La Tuque, Champlain.....	12	182
Parent, Champlain.....	12	181
Duchesnay, Portneuf.....	16	215
Montreal.....	35	2,037
Quebec.....	12	1,043
Hull.....	12	678

EXHIBITIONS

In the course of the fiscal year 1935-36, the Bureau of Mines participated in eight exhibitions, as follows:

The Eastern Townships Agricultural Association Fair, in Sherbrooke, June 20th to July 9th, 1935.

Trois-Rivières Regional Exhibition, August 11th to 16th, 1935.

Quebec Provincial Exhibition, August 31st to Sept. 7th, 1935.

Salon Industriel, organized by *L'Événement*, Quebec, October 22nd to 26th, 1935.

Exhibition of l'Association Canadienne-Française des Aveugles, held in Montreal, October 17th to 31st, 1935.

National "Produced in Canada" Exhibition, held in Montreal, November 6th to 16th, 1935.

Commercial and Industrial Exhibition of Hull, May 24th to 31st, 1936.

Commercial Exhibition of Joliette, June 4th to 13th, 1936.

PUBLICATIONS

The Bureau of Mines employs various means to disseminate authentic information concerning the mineral industry of the Province, its present status and its possibilities. Participation in exhibitions has already been referred to. Chiefly important, however, are the Bureau's publications.

The main publication is the *Annual Report* which, in recent years, has comprised five volumes, or parts, the first dealing with mining operations and statistics of production, employment, etc., for the year concerned, and the others with the geology and economic resources of selected areas or with current development in various mining camps or fields.

Shortly after the close of the field season, *Advance Reports* on particular areas are issued. These contain the latest available results of prospecting, surface exploration, or mine operation in the area dealt with.

Monthly Bulletins give, in tabular form, output data, with quantity and value, for the chief products of our mines for the month concerned, for the year to date, and for the corresponding month in the previous year. They thus present a clear picture of the progress of the industry from month to month.

As soon as possible after the close of the year, a *Preliminary Statistical Report* is issued, giving a provisional itemized table of mineral production for the whole year. The revised and more detailed table is later included in Part A of the *Annual Report*.

All these publications are issued in both English and French, and they are sent free to anyone, on request.

In addition to these strictly departmental publications, and as a further means of spreading information concerning the mineral resources of the Province and their development, officers of the Bureau contribute numerous papers and articles to various technical journals, magazines, and the general press. During the fiscal year 1935-36, seventeen such articles, containing about 21,000 words, were published in technical periodicals and newspapers.

To meet the numerous requests for a map showing the location of mining properties in Western Quebec, Map No. 335 was brought up to date and a new edition, the third, of 2,300 copies, was printed late in 1935. Distribution commenced in January, 1936, and the demand has been such that, at time of writing, the map is already out of print.

MINE ROADS

The development of our mineral resources in Abitibi and Témiscamingue counties, and the operation of the producing mines, necessitate the construction of networks of roads. The mining-road programme, which was started in 1929, has enabled the Bureau of Mines to open and improve a total of 530.55 miles of roads up to June, 1936, at a total cost of \$2,551,764.64.

During the fiscal year ending June 30th, 1936, the Bureau of Mines expended the sum of \$119,764.64 on mining-road surveys, construction, improvement, and maintenance in the counties of Abitibi, Témiscamingue, Matapédia, and Portneuf, and in Abitibi district, as detailed below:

Lévy and Beaudin Townships.—Road from Bourgmont to Qpemiska Copper Mines.

Portland East Township.—Road from National Highway to Bertrand mine.

Latulipe, Blondeau, and Guillet Townships.—Winter road from Latulipe to Guillet lake.

Rouyn Township.—Road to Stadacona Rouyn mine.

Awantjish Township.—Road in Awantjish township.

Rouyn-Louvicourt Townships.—Road from Rouyn-Louvicourt to property of Shawkey Gold Mining Company.

Montauban Township.—Road to Tétreault mine.

Dufferin Township.—Road from Notre-Dame-de-la-Doré towards Chibougamau.

COMPANY INCORPORATIONS

Forty new mining companies were incorporated in the Province of Quebec in 1935. In addition, two mining companies that were incorporated in 1935 by Letters Patent of the Federal Government acquired mining rights in the Province of Quebec, as also did fifteen companies that were incorporated in the Province of Ontario.

Particulars of these incorporations are given in the accompanying tables:

MINING COMPANIES INCORPORATED IN THE PROVINCE OF QUEBEC
in 1935

NAME OF COMPANY	HEAD OFFICE	DATE OF INCORPORATION	NO. OF SHARES
Abitibi-Or, Limitée.....	Montreal	June 8th, 1935	3,000,000
Adnaron Mines, Limited.....	Rouyn	June 17th, 1935	49,550
Avon Gold Mines, Limited.....	Montreal	Jan. 25th, 1935	3,000,000
Beaufor Mining Corporation.....	Pascalis	June 22nd, 1935	3,000,000
Chadbourne Development Co., Ltd.....	Montreal	Sept. 6th, 1935	200
Champs d'Or de Batiscan, Inc. (Les).....	Joliette	June 19th, 1935	2,000
Colonial Gold Syndicate, Ltd.....	Montreal.	June 25th, 1935	5,000
Compagnie Minière Franco-Canadienne, Limitée (La).....	Amos	Oct. 17th, 1935	3,000,000
Compagnie Minière Muscovite de Charlevoix, Ltée.....	La Malbaie	Oct. 12th, 1935	5,000
Duvernay Consolidated Gold Mines, Inc.....	Montreal	Oct. 13th, 1935	3,000,000
Eudo Gold Mines, Limited.....	Rouyn	Oct. 21st, 1935	99,999
Gains-Moor Gold Mines Syndicate, Ltd.....	Montreal	June 22nd, 1935	12,000
Gold Mining Claims, Limited.....	Montreal	Dec. 17th, 1935	1,000
Harricana Basin Mining Company.....	Amos	Dec. 21st, 1935	2,000
Harris Bousquet Gold Mines, Limited.....	Montreal	Jan. 7th, 1935	1,000,000
James Patrice Gold Mines, Limited (The).....	Rouyn	June 20th, 1935	3,000,000
Lacorne Mines, Limited.....	Canton de Lacorne	Apr. 10th, 1935	340,000
Lake Doré Mines, Limited.....	Toronto	Apr. 27th, 1935	3,000,000
Laurentian Iron Oxide Co., Limited.....	Montreal	Apr. 29th 1935	(1) 16,000
Laurentide Mica Mine Syndicate, Ltd.....	Quebec	Jan. 7th 1935	3,996
Malartic Gold Fields, Limited.....	Montreal	Jan. 4th, 1935	4,000,000
McKay (Quebec) Exploration, Ltd.....	Montreal	Apr. 2nd, 1935	10,000
Mega Mining Syndicate (The).....	Quebec	May 22nd 1935	200
Normac Gold Mines, Limited.....	Rouyn	Mar. 22nd 1935	19,500
Poulin Mining Company, Limited.....	St-Lambert	May 4th, 1935	3,000,000
Pre-Cambrian Prospectors, Limited.....	Rouyn	Apr. 17th, 1935	20,000
Quebec La Pause Gold Mines, Limited.....	Montreal	Feb. 9th, 1935	200
Ranic Gold Mines, Limited.....	Amos	Nov. 6th, 1935	500,000
Riverside Gold Mines, Inc.....	Rouyn	Apr. 29th, 1935	20,000
Roseoc Development Company, Limited.....	Montreal	Feb. 16th, 1935	3,000,000
St-Lawrence Mica Mines, Limited.....	Quebec	June 15th, 1935	500,000
San Pedro Gold Mining and Prospecting Corporation.....	Montreal	Apr. 8th, 1935	9,500
Sanvar Mines, Limited.....	Montreal	Mar. 19th, 1935	50
Sisoc Extension Gold Mines, Limited.....	Montreal	Aug. 8th, 1935	3,000,000
Syndicat Charlevoix Radium Exploration, Ltée.....	Quebec	Dec. 9th, 1935	148,000
Syndicat Laumayor, Limitée.....	Montreal	Mar. 22nd, 1935	49,999
Syndicat Monicool, Inc. (Lc).....	Montreal	Jan. 28th, 1935	2,000
Thompson Cadillac Mining Corporation.....	Montreal	Mar. 21st, 1935	3,000,000
United Gold Mines, Limited.....	Montreal	May 4th, 1935	3,000,000

(1) 14,000 common shares no par value, 2,000 preferred shares of \$10.00 each.

MINING COMPANIES INCORPORATED IN 1935 BY LETTERS PATENT OF THE FEDERAL
GOVERNMENT AND WHICH HAVE ACQUIRED MINING RIGHTS
IN THE PROVINCE OF QUEBEC

NAME OF COMPANY	HEAD OFFICE	DATE OF INCORPORATION	NO. OF SHARES
Canadian Shield Mining Syndicate, Ltd.	Ottawa	Apr. 6th, 1935	5,000
Pascourt Developments, Limited.	Ottawa	Feb. 23rd, 1935	50,000

MINING COMPANIES INCORPORATED IN 1935 IN THE PROVINCE OF ONTARIO AND WHICH
HAVE ACQUIRED MINING RIGHTS IN THE PROVINCE OF QUEBEC

NAME OF COMPANY	HEAD OFFICE	DATE OF INCORPORATION	NO. OF SHARES
Ascot Gold Mines, Ltd.	Toronto	Apr. 1st, 1935	3,000,000
Avocalon Extension Syndicate, Ltd.	Toronto	Jan. 22nd, 1935	2,500
Ceres Exploration, Limited.	Ottawa	Feb. 2nd, 1935	250,000
Duquesne Mines, Limited.	Toronto	Apr. 12th, 1933	5,000,000
Emperor Gold Syndicate, Limited.	Toronto	Dec. 2nd, 1935	1,000
Florence River (Quebec) Gold Mines, Limited.	Toronto	Oct. 11th, 1935	3,000,000
Garth Chiboug Gold Syndicate, Ltd.	Toronto	May 21st, 1935	10,000
Gold Quartz Mining Corporation, Limited.	Toronto	Feb. 2nd, 1935	2,000,000
Kotter Gold, Limited.	Toronto	July 24th, 1935	40,000
Lacoma Gold Mines, Limited.	Toronto	May 11th, 1935	3,000,000
Lake Expanse Gold Mines, Limited.	Toronto	July 8th, 1935	3,000,000
La Sarre Gold Mines, Limited.	Toronto	June 11th, 1935	3,000,000
O'Neill Thompson Gold Mines, Ltd.	Ottawa	Aug. 26th, 1935	3,000,000
Primrose Exploration Co., Ltd.	Ottawa	July 19th, 1935	250,000
South Tiblemont Gold Mines, Ltd.	Toronto	Feb. 7th, 1935	2,500,000
Val d'Or Mineral Holdings, Ltd.	Toronto	Sept. 5th, 1935	750,000

MINING OPERATIONS IN 1936

METALS

COPPER

Returns of production of copper were received from three mining companies in 1936. *Noranda Mines, Limited*, produced copper in the form of anodes, the output of the Noranda smelter, in Rouyn township, and the *Consolidated Copper and Sulphur Company, Limited*, produced copper concentrate, which was shipped to an American smelter for treatment. The third copper producer was *Greene-Stabell Mines, Limited*, now reorganized as *Jacola Mines, Limited*, from whose operations a small shipment of copper concentrate was made to the Noranda smelter.

The Noranda smelter treats the gold-bearing copper ore of the Horne mine of *Noranda Mines, Limited*, the charge consisting of lump ore, and of concentrate which is the product of the flotation mill, where the low-grade copper ore is concentrated about six tons to one. Operations at the Hornemine in 1936 are described in detail in the report of R. H. Taschereau, Inspector of Mines for Western Quebec, which will be found on pages 53-55.

The *Consolidated Copper and Sulphur Company, Limited*, operates the Eustis mine, near Sherbrooke. From the ore, two concentrates are produced, one of pyrite, which is used in the manufacture of sulphuric acid, and one of copper ore, which is smelted in the United States.

The Eustis mine has been producing since 1865. By the end of 1936 it had reached a depth of 6,950 feet. The main shaft, inclined at an average of 41 degrees, extends to the 6,350-ft. level, at which horizon No. 2 shaft, offset 50 feet from the main shaft and inclined at a steeper slope, averaging 45 degrees, continues to the bottom of the mine. For the past five years, the latter shaft has been deepened about 350 feet per year. During 1936, six new 'conditioning' tanks were added in the flotation mill, and a storage bin of 200 tons capacity has been constructed.

The old Suffield mine, acquired by *Poulin Gold Mines, Limited*, was inactive during the first eight months of 1936. In September, a few men were employed on repairs to the timbering of the shaft and to the buildings. This was followed by driving two galleries, of a total length of 150 feet, on the 68-foot level, and in December a diamond-drill had been brought to the property.

QUEBEC PRODUCTION OF COPPER, 1925-1936

YEAR	QUANTITY (Pounds)	VALUE \$	YEAR	QUANTITY (Pounds)	VALUE \$
1925	2,628,417	\$ 277,083	1931	68,376,985	\$ 5,723,154
1926	2,674,058	368,886	1932	67,336,692	4,296,216
1927	3,119,848	407,146	1933	69,943,882	5,214,177
1928	33,697,949	4,909,792	1934	73,968,545	5,487,948
1929	55,337,169	10,019,901	1935	79,050,906	6,162,350
1930	80,310,363	10,425,891	1936	66,340,175	6,287,058

The production of copper from Quebec mines in 1936 was 66,340,175 pounds, valued at \$6,287,058. As compared with the previous year, this is a decrease of 19 per cent in volume, but the value of the output was 1.2 per cent higher than in 1935, owing to an appreciable increase in the average price of the metal.

By far the greater part of the Quebec copper output is sold in London, on which market the average price of copper in 1935 was £35.43 per long ton (equivalent to 7.795 cents per pound). For January, 1936, the average was £38.788 per ton, and the price rose steadily until for December it reached £42.65 (9.477 cents per pound). The price continued to advance in the early months of 1937 until, for April, the average was £76.167 per ton. In May, however, the average receded to £63.684.

GOLD AND SILVER

GOLD

The production of gold in 1936 totalled 666,905 ounces, valued at \$23,361,682, as compared with 470,545 ounces, valued at \$16,558,478, in the previous year. On a value basis, this is an advance of \$6,803,204, or 41 per cent, over 1935. The average price of gold in Canadian funds in 1936 was \$35.03. The weight of gold in the United States dollar was fixed at 15 ⁵/₂₁ grains, nine-tenths fine, by proclamation dated January 31st, 1934, which automatically increased the price of fine gold to \$35.00 per ounce in United States funds.

In point of value, gold easily leads all other items of our list of mineral products. It accounts for nearly 47 per cent of the value of our total production in 1936.

Returns of production of gold were received from 20 operators, of whom 19 are in Western Quebec and one in Montauban township, Portneuf county. Of the 20 mines reporting, 18 were producing from straight gold ore, in which the gold is accompanied only by silver, and two from complex sulphide ores. The latter are the Horne mine of Noranda Mines, Limited, in Rouyn township, the ore of which contains copper, gold, silver, selenium, and tellurium, all of which are recovered; and the Tétreault mine, in Montauban township, which produces ore containing lead, zinc, gold, and silver.

QUEBEC GOLD PRODUCTION, 1898-1936

YEAR	AMOUNT (Ounces)	VALUE \$	YEAR	AMOUNT (Ounces)	VALUE \$	YEAR	AMOUNT (Ounces)	VALUE \$
1898	370	6,500	1911	590	11,800	1924	881	18,372
1899	272	4,916	1912	980	19,924	1925	1,834	37,809
1900	nil	nil	1913	738	14,794	1926	3,679	76,070
1901	80	1,440	1914	998	21,064	1927	8,331	172,214
1902	300	5,400	1915	1,158	23,082	1928	60,006	1,240,435
1903	55	1,000	1916	632	13,041	1929	90,798	1,876,900
1904	20	160	1917	1,116	22,570	1930	141,747	2,930,480
1905	nil	nil	1918	1,578	32,615	1931	300,075	6,476,103
1906	nil	nil	1919	1,446	29,420	1932	401,105	9,417,576
1907	nil	nil	1920	935	19,346	1933	382,886	10,950,540
1908	nil	nil	1921	648	12,317	1934	390,103	13,458,554
1909	nil	nil	1922	nil	nil	1935	470,545	16,558,478
1910	nil	nil	1923	667	13,340	1936	666,905	23,361,682

Great activity reigned in all the mining fields of Western Quebec throughout the year. In the Rouyn-Harricana belt, in Chibougamau, in Opemisca, and in the regions of Madeleine lake and Guillet township, the amount of work in mining, in development, and in detailed exploration of mineral deposits and occurrences, is increasing year by year. In the Rouyn-Harricana belt alone, which extends for 125 miles from the Ontario-Quebec boundary eastward to the Bell River basin, L. V. Bell, of the Bureau of Mines, during the field season of 1936, examined more than 150 mines and mining properties. Of these, 16 were mines in active production, 50 were properties under development by extensive underground workings, 52 were being explored by diamond-drilling previous to starting shaft-sinking and drifting, and, on the remainder, test-pitting, trenching, and other surface work was being carried out. The results of Dr. Bell's examination were published in mimeotyped report *P. R. No. 116*. Similar field work in Chibougamau was done by G. S. MacKenzie, whose report appears on pages 83-115 of this volume.

Additional details of operations and development work in the gold mines of Western Quebec in 1936 are given in the report of R. H. Taschereau, Inspector of Mines, on pages 49-82 of this volume.

ALLUVIAL GOLD^①:

A serious endeavour is being made by *Embergold Mines, Limited*, under the direction of Dr. Robert Harvie, to work the placer deposits in Ditton and Emberton townships, in Compton county, extending the area which was worked profitably some fifty years ago.

During the summer, work was carried on in the shallower sections on the Ditton and Little Ditton rivers. During the fall and winter, a deeper portion of the old valley on the Little Ditton, or Mining brook, was being systematically examined by underground work, and this work is still in progress at the time of writing, in the spring of 1937.

The number of men employed in these operations for the full year has averaged twenty-five. A two-compartment shaft, with dimensions 7 ft. by 9 ft. and 25 feet deep, has been sunk on lot 14, range X, Ditton. At August 1st, 1937, a total of 1,325 feet of drifting, 6 ft. by 6 ft., had been completed from the shaft. The purpose of this work was to follow underground the old channel of the river where it happens to be covered by glacial deposits. Preliminary investigations conducted by Dr. Harvie at both ends of this covered channel showed undisturbed pre-Glacial yellow clays and gravels carrying gold. Starting, therefore, with one rim of the channel defined by outcrops, the problem of finding the other rim was solved and the direction of the channel determined. The work now in progress consists in exploring the channel up-stream for pay streaks.

This is the most ambitious attempt that has been made to explore any of the Quebec placers for a number of years.

^① By Eugène Laroehelle, Inspector of Mines.

SILVER

Quebec's silver production consists entirely of metal recovered as a by-product in the treatment of the complex copper-gold and gold-quartz ores of Western Quebec, of the copper-sulphur ores of the Sherbrooke region, and of the zinc-lead sulphide ores of Portneuf county, all of which contain silver in small amount.

In 1936, the silver thus recovered amounted to 724,339 ounces, valued at \$326,872, as compared with 668,836 ounces valued at \$433,338 in 1935. This is an increase of 8.3 per cent in quantity, but a falling off of 32.5 per cent in value, the average price for silver having decreased from an average of 64.77 cents per ounce in 1935 to 45.127 cents in 1936. There has been no appreciable recovery in the price of the metal on the New York market during the early months of 1937.

LEAD

Shipments of lead concentrate and ore, carrying 2,047,689 pounds of the metal, were made from Quebec mines in 1936. In our table of mineral production, the lead content of these shipments is valued at \$80,126. The quantity is practically the same as in 1935, when ore and concentrate containing 2,047,624 pounds of lead was shipped, but owing to the higher price obtaining for the metal, the value was 25 per cent higher than in 1935.

This concentrate and ore was shipped to European smelters for treatment, as there are no lead-smelting works in eastern Canada.

For the purpose of our statistics, the value of the lead content of these shipments is calculated on the basis of the average yearly price of pig lead on the London market. It does not represent the actual amount paid to the Quebec mining companies for the concentrate shipped. They received very appreciably less than the amount shown in our table of mineral production. The same observation holds true for the zinc concentrate shipped from these same mines, which all goes to refineries in Belgium.

Except for a trial shipment of twenty tons of hand-picked ore mined in the course of development work on a recently discovered deposit in Gaspé peninsula, the whole of the lead production came from the *Tétreault mine*, in Portneuf county, as in the previous year.

The following notes on the Gaspé deposit are by I. W. Jones, geologist, of the Bureau of Mines staff: "*Gulf Development Company, Limited*, has been doing some development work on a deposit of argentiferous galena, with sphalerite, situated on lots 1 and 2, range I, township of Mann, in Bonaventure county. The occurrence is found in volcanics, which have been classified as being Lower Devonian by Dr. F. J. Alcock, of the Geological Survey of Canada.

"During 1936, some trenching was done on the original showing and it is reported that a shipment of twenty tons of picked ore from it was made to Belgium. This shipment was said to have averaged 37 per cent lead, some zinc, and three ounces of silver to the ton. A limited amount of trenching was also done on the opposite (east) side of the brook that passes through the property.

"The road to the deposit, from the highway, little more than half a mile distant, was made suitable for motor traffic. A building to be used as office and store-house was erected during the summer, and it is reported that a mining plant was installed during the autumn".

SELENIUM

The selenium produced in the Province of Quebec is a by-product obtained in the course of refining the copper anodes of the Noranda smelter. Shipments in 1936 amounted to 168,417 pounds, valued at \$298,098. The average price of selenium for the year, on the London market, was \$1.77 per pound. In 1935, 206,421 pounds were produced, valued at \$396,328, and the average market price was \$1.92 per pound. Of the four provinces which contribute to Canada's production of selenium, Quebec ranks first.

The main industrial uses of selenium are for the manufacture of red pigments; in the glass industry, both as a decolorant and in the production of ruby-red glass; in the rubber industry; in the manufacture of the selenium cell for use in the so-called 'electric eye'; and in the manufacture of stainless-steel alloys.

ZINC

The production of zinc in 1936 was 6,896,123 pounds, valued at \$228,606, contained in concentrate from the Tétreault mine, Portneuf county. This was shipped to smelters in Belgium, as there are no zinc-smelting works in eastern Canada. As compared with the previous year, there was an increase of 30 per cent in quantity and of 38 per cent in value, the price on the London market having appreciably improved in 1936.

For statistical purposes, the value of the zinc production is calculated at the average yearly price of spelter on the London market. The amount received by the mine operators is appreciably less than the value shown in the table of mineral production.

MISCELLANEOUS METALS

CHROMITE

Some 545 tons of chromite, valued at \$8,508, were produced from the Beaver mine, in Coleraine township, one of the properties of the *Asbestos Corporation, Limited*. Some of this ore was shipped to Montreal and the balance to Sault Ste-Marie.

At the property of the *Quebec Asbestos and Chrome Company*, lots 8, 9, and 10, range X, of Cleveland township, Richmond county, some pits and 100 feet of shafting, down to the first level, were de-watered to permit an examination of the ore-body. Twenty bags of samples, picked off the dumps, were shipped from St-Cyr station.

Pantaléon Plante did a little exploration work for chromite on lot 11, range X, of Awantjish township, Matapedia county.

TELLURIUM

The production of tellurium in 1936 amounted to 19,502 pounds, valued at \$34,519. This represents the tellurium content of the copper anodes shipped by *Noranda Mines, Limited*, to the copper refining plant of Canadian Copper Refiners, Limited, at Montreal East.

TITANIFEROUS IRON ORE

The production of titanium ore was 2,566 tons, valued at \$18,318. This was shipped by the *Baie St-Paul Titanic Iron Ore*, Baie St-Paul, some going to Niagara Falls, N.Y., and the balance to Schenectady, N.Y.

NON-METALLICS *

ASBESTOS †

STATISTICS OF PRODUCTION, EXPORTS, ETC.

For the second successive year, following the lean period 1931-34, we record a very substantial improvement in the asbestos industry of Quebec. Sales or shipments of unmanufactured asbestos totalled 301,287 tons, valued at \$9,958,183, as compared with 210,467 tons valued at \$7,054,614 in 1935. On a percentage basis, the increases are respectively 43 per cent and 41 per cent. In point of volume, shipments were higher than in any previous year with the exception of 1929, when the total was 306,055 tons (see Table 3). The average price of the asbestos marketed in 1936 was \$33.05 per ton, as against \$33.52 per ton in 1935.

A total of 4,692,004 tons of rock was mined during the year, of which 1,123,012 tons, or 23.9 per cent, was sent to the dumps as barren rock. The 3,568,992 tons of mill-rock treated for recovery of asbestos yielded 311,205 tons of fibre, an average of 132.65 pounds per ton of rock mined, or 6.63 per cent. At the prices prevailing during the year for the several grades of asbestos, the fibre produced had to total value of \$9,927,643 or \$31.90 per ton, and the rock mined had a value of \$2.13 per ton.

TABLE 1
PRODUCTION OF ASBESTOS IN THE PROVINCE OF QUEBEC FOR 1936

GROUPING OF GRADES	SHIPMENTS AND SALES		AVERAGE VALUE PER TON
	TONS	VALUE	
Crudes.....	3,440	\$ 790,971	\$ 229.93
Fibres.....	133,288	6,483,946	48.65
Shorts.....	164,559	2,683,266	16.30
TOTALS.....	301,287	\$9,958,183	\$ 33.05
Sand, gravel, and stone (waste rock only).....	3,103	\$ 2,356	\$ 0.76
TOTALS.....	304,390	\$9,960,539	

Quantity of rock mined during the year 1936: 4,692,004 tons.
Quantity of rock milled during the year 1936: 3,568,992 tons.

* Unless otherwise stated, notes on Non-Metallics are by Paul-E. Bourret, Inspector of Mines.

† By Eugène Larochelle, Inspector of Mines.

TABLE 2
PRODUCTION OF ASBESTOS IN THE PROVINCE OF QUEBEC FOR 1935

GROUPING OF GRADES	SHIPMENTS AND SALES		AVERAGE VALUE PER TON
	TONS	VALUE	
Crudes.....	2,278	\$ 539,558	\$236.86
Fibres.....	102,270	4,873,255	47.65
Shorts.....	105,919	1,641,801	15.50
TOTALS.....	210,467	\$7,054,614	\$ 33.52
Sand, gravel, and stone (waste rock only).....	3,025	\$ 2,053	\$ 0.68
TOTALS.....	213,492	\$7,056,667	

Quantity of rock mined during the year 1935: 2,852,118 tons.

Quantity of rock milled during the year 1935: 2,256,994 tons.

TABLE 3
TABLE OF DATA OF THE QUEBEC ASBESTOS INDUSTRY FOR THE YEARS
1911-1936

YEAR	FIBRE SHIPPED (Tons)	TOTAL VALUE	AVERAGE VALUE (Per Ton)	FIBRE PRODUCED (Tons)	ASBESTOS CONTENT PER TON OF ROCK (Pounds)	AVERAGE VALUE OF CONTENT OF ROCK (Per Ton)	ROCK MINED (Tons)
1911.....	102,224	\$3,026,306	\$29.60	94,816	107.80	\$1.53	1,583,076
1912.....	111,175	3,050,084	27.52	101,600	108.60	1.38	1,870,608
1913.....	136,609	3,830,504	28.04	133,174	105.40	1.45	2,527,410
1914.....	107,401	2,895,935	26.96	118,452	111.40	1.43	2,127,395
1915.....	113,115	3,544,362	31.33	103,361	96.90	1.46	2,134,073
1916.....	133,339	5,182,905	38.87	117,577	102.60	2.12	2,291,087
1917.....	137,242	7,198,558	52.45	138,174	108.70	3.08	2,634,410
1918.....	142,375	9,019,809	63.35	143,401	117.30	4.08	2,445,745
1919.....	135,862	10,932,289	80.47	154,380	100.80	3.88	3,601,690
1920.....	179,891	14,749,048	81.89	170,500	109.10	4.53	3,123,370
1921.....	87,475	5,199,789	59.44	117,458	107.20	4.28	2,224,138
1922.....	160,339	6,053,068	37.75	149,195	102.00	1.70	2,920,280
1923.....	216,804	7,361,260	33.97	218,959	117.00	1.42	3,747,576
1924.....	208,762	6,561,659	31.37	205,764	124.00	1.83	3,324,727
1925.....	273,522	8,976,645	32.82	267,328	129.70	1.95	4,121,258
1926.....	279,389	10,095,487	36.13	301,044	134.30	2.35	4,483,361
1927.....	274,778	10,621,013	38.65	274,763	113.70	2.13	4,834,761
1928.....	271,637	11,181,143	41.16	266,227	103.20	2.17	5,141,263
1929.....	306,055	13,172,581	43.04	309,746	99.76	2.21	6,208,970
1930.....	242,113	8,390,164	34.65	244,114	99.61	1.90	4,901,206
1931.....	161,297	4,812,886	29.29	154,872	136.20	1.99	2,274,048
1932.....	(a) 122,977	3,039,721	24.72	119,968	129.38	1.60	1,145,340
1933.....	(b) 155,367	5,211,177	32.90	151,842	145.38	2.39	1,566,919
1934.....	155,980	4,936,326	31.65	173,604	149.60	2.45	2,320,750
1935.....	210,467	7,054,614	33.52	213,283	149.56	2.42	2,852,118
1936.....	301,287	9,958,183	33.05	311,205	132.65	2.11	4,692,004

(a) Calculated on 1,854,434 tons, *i.e.*, 1,145,340 tons of rock mined and 709,094 tons of tailing re-treated.

(b) Calculated on 2,088,849 tons, *i.e.*, 1,566,919 tons of rock mined and 521,930 tons of tailing re-treated.

TABLE 4
ANNUAL SHIPMENTS OF ASBESTOS, 1925-1936(*)

(Tons of 2,000 lb.)

YEAR	CRUDE No. 1	CRUDE No. 2	OTHER CRUDES	SPINN'G FIBRE	SHINGLE FIBRE	MILL BOARD & PAPER FIBRE	FILLERS, FLOATS & OTHER SHORT FIBRE	TOTAL ASBESTOS SHIPPED	ASBESTIC
1925.....	1,044	3,777	348	16,070	30,010	93,935	128,338	273,522	16,865
1926.....	1,094	3,494	446	15,182	30,497	86,746	135,930	279,389	15,672
1927.....	1,107	3,014	667	14,318	44,573	69,396	150,673	274,778	18,974
1928.....	893	2,713	516	13,504	34,556	78,123	141,332	221,637	22,788
1929.....	802	2,625	931	17,545	34,177	91,157	158,818	308,055	18,976
1930.....	720	1,440	161	10,411	19,909	79,738	129,734	242,113	40,309
Totals 1925-1930	5,660	17,063	3,069	87,060	199,722	490,095	844,825	1,647,494	133,584

YEAR	CRUDE No. 1	CRUDE No. 2	OTHER CRUDES	SPINN'G FIBRE	SHINGLE FIBRE	PAPER FIBRE	WASTE, STUCCO OR PLAST'R	REFUSE OR SHORTS	TOTAL ASBESTOS SHIPPED	ASBESTIC
1931.....	206	543	.....	8,560	15,988	39,867	6,309	92,823	164,296	7,209
1932.....	144	313	14	6,004	6,626	32,694	3,984	73,199	122,977	3,473
Totals 1931-1932	350	856	14	14,564	22,613	72,561	10,293	166,022	287,273	10,682
Totals 1879-1932	76,203	111,027	71,698	.....	.....	.....	.....	.....	4,754,030	645,100

YEAR	CRUDES	FIBRE	SHORTS	TOTAL ASBESTOS SHIPPED	SAND, GRAVEL, AND STONE (waste rock only)
1933.....	1,306	82,605	74,456	158,367	6,445
1934.....	1,663	77,465	76,852	155,980	4,672
1935.....	2,278	102,270	105,919	210,467	3,025
1936.....	3,440	133,288	164,559	301,287	3,103

(*) For figures for 1879-1924, see report for the calendar year 1932.

The tonnage of rock mined in 1936 was 64.5 per cent higher than the tonnage mined in 1935, and there was an increase of two million in the number of hours worked by employees in the mines and mills.

Exports of unmanufactured asbestos amounted to 294,225 tons, valued at \$9,958,860, an increase of 47 per cent in volume and 44.6 per cent in value over the preceding year. As is usual, the great bulk of our asbestos output was exported, unmanufactured, to the United States of America (see Table 5).

Table 6 shows the origin of the asbestos fibre imported by the United States during the years 1935 and 1936. As will be noted, Canada (that is, Quebec) was by far the largest contributor to these imports, though her

TABLE 5

EXPORTS FROM CANADA OF UNMANUFACTURED ASBESTOS DURING THE CALENDAR YEAR 1936

(From *Trade of Canada, Calendar Year 1936*, Dom. Bur. of Statistics)

IMPORTING COUNTRY	CRUDE & FIBRE		SHORT FIBRE, SHORTS & WASTE		TOTAL	
	Tons 2,000 lb.	Value \$	Tons 2,000 lb.	Value \$	Tons 2,000 lb.	Value \$
United Kingdom	6,817	\$ 405,712.00	4,566	\$ 84,711.00	11,383	\$ 490,423.00
United States	77,691	4,052,187.00	146,081	2,350,527.00	223,772	6,402,714.00
Argentina	28	1,118.00	46	858.00	74	1,976.00
Austria						
Australia	2,055	103,271.00	10	231.00	2,065	103,502.00
Belgium	8,058	455,828.00	1,606	27,364.00	9,664	483,192.00
British India	120	6,000.00	60	750.00	180	6,750.00
Colombia	2	230.00			2	230.00
Czechoslovakia						
Dutch East Indies						
France	6,968	473,406.00	1,091	21,201.00	8,059	494,607.00
Germany	12,811	987,125.00	3,423	68,911.00	16,234	1,056,036.00
Hungary						
Italy	136	11,444.00			136	11,444.00
Japan	21,200	856,167.00	181	3,496.00	21,381	859,664.00
Netherlands	164	5,634.00	110	2,233.00	274	7,867.00
Norway	5	350.00			5	350.00
Poland	286	21,684.00	128	2,683.00	414	24,367.00
Portugal	5	179.00	5	111.00	10	290.00
Spain	201	11,182.00			201	11,182.00
Uruguay						
Brazil			10	429.00	10	429.00
Cuba			90	537.00	90	537.00
Puerto Rica			30	330.00	30	330.00
Sweden			241	2,971.00	241	2,971.00
TOTALS	136,547	\$7,391,517.00	157,678	\$2,567,343.00	294,225	\$9,958,860.00

TABLE 6

ASBESTOS (UNMANUFACTURED) IMPORTED FOR CONSUMPTION IN THE UNITED STATES IN 1935 AND 1936, BY COUNTRIES AND CLASSES

(Compiled from *Mineral Market Reports*, No. M.M.S. 481 and No. M.M.S. 536, U. S. Bureau of Mines)

EXPORTING COUNTRY	CRUDE (INCLUDING BLUE FIBRE)		MILL FIBRE		STUCCO and REFUSE		TOTALS	
	1936		1936		1936		1936	
	Short Tons	Value \$	Short Tons	Value \$	Short Tons	Value \$	Short Tons	Value \$
Africa, British:								
Union of S. Af.	2,080	\$ 246,171					2,080	\$ 246,171
Other	3,266	412,138					3,266	412,138
Canada	2,281	432,004	56,484	\$2,972,137	150,538	\$2,469,910	209,303	5,874,051
Finland			22	840	59	1,528	81	2,368
Russia (U.S.S.R.)	35	5,972	6,382	300,300			6,417	306,272
Hungary			16,775	516,713			16,775	516,713
Italy	30	22,030			1,044	14,187	1,074	36,217
Malta, Gozo, Cyprus					4,386	91,706	4,386	91,706
Morocco								
United Kingdom	220	39,236	2	65			220	39,301
TOTALS for 1936	7,912	\$1,157,551	79,663	\$3,790,055	156,027	\$2,577,331	243,602	\$7,524,937
TOTALS for 1935	3,940	639,980	63,098	\$2,920,242	99,547	\$1,565,191	166,585	\$5,125,413

TABLE 7

UNMANUFACTURED ASBESTOS IMPORTED INTO THE UNITED KINGDOM FOR THE
YEARS 1935 AND 1936

(From *Asbestos*, February 1937)

EXPORTING COUNTRY	1935		1936	
	TONS 2,240 lb.	VALUE £	TONS 2,240 lb.	VALUE £
Africa (Rhodesia).....	11,892	£ 274,345	16,679	£ 382,274
Africa (Union of South).....	10,938	155,826	12,093	177,431
Africa (Portuguese East).....	.....	1	.....	7
Australia.....	145	2,006	147	2,885
Austria.....	60	414	.....	.....
Belgium.....	2	37	10	105
British India.....	7	342	1	6
Canada.....	7,168	83,997	10,219	117,886
Cyprus, Malta, & Gozo.....	177	6,769	1,605	18,687
Czechoslovakia.....	2	19	.....	.....
Denmark.....	.....	.....	100	1,637
Finland.....	95	625	102	787
France.....	.....	.....	6	40
Germany.....	23	630	16	1
Italy.....	56	2,606	4	477
Kenya.....	.....	.....	2	60
Netherlands.....	.....	71	29	1,026
Soviet Union (Russia).....	1,230	31,966	1,854	29,995
Switzerland.....	.....	2	.....	.....
United States of America.....	64	1,446	27	664
Venezuela.....	47	653	62	1,528
TOTALS.....	31,906	£ 561,755	42,956	£ 735,496

percentage share was less in 1936 than in 1935, the actual figures being 86 per cent in quantity and 78 per cent in value in 1936, as against 92.6 per cent and 87.6 per cent, respectively, in 1935. These figures are for asbestos of all grades. Considering 'crude' alone, however, Canada takes second place to Africa, the latter country contributing 68 per cent by volume and 57 per cent by value to the United States imports of crude in 1936, whereas Canada supplied only 29 per cent by volume, and 38 per cent by value, of the total. The African 'crude', it may be mentioned, included 'blue fibre'. We would also call attention to the growing importance of Russia's exports to the United States of 'mill fibre'. For 1936, these appear in the Table as 6,382 tons. However, there is no doubt that the 16,775 tons attributed to Hungary originated in Russia. It would thus appear that, in 1936, the United States actually imported 23,157 tons of Russian mill fibre of total value \$817,013, as compared with 4,614 tons, valued at \$206,347, in 1935. Thus Russia's percentage of the total United States imports of mill fibre rose sharply from 2.9 per cent in quantity and 4.1 per cent in value in 1935 to 9.5 per cent and 10.9 per cent in 1936. We cannot but conclude that Russian mill fibre is becoming a very serious competitor of the Canadian material in the United States market.

The expansion of Russia's asbestos industry at the expense of that of Canada is further illustrated in Table 8, giving the value of imports of asbestos into Germany for each of the six years, 1930-1935. It will be seen that Canada's total for the six years is greater than that of any other contributing country, but analysis of the figures for individual years shows that, whereas in 1930 Canada supplied 42 per cent, in value, of Germany's

asbestos imports, in 1935 the figure had dropped to 23 per cent. On the other hand, Russia's share increased from 12.5 per cent in 1930 to 50.5 per cent in 1935.

Table 9 shows the quantity and value of imports of asbestos into Germany from all countries and, separately, imports from Canada alone, for the year 1913 and for each of the years 1924-1935. Canada's contribution, which was 48.5 per cent of the total tonnage in 1913, reached a maximum of 64.5 per cent in 1929, following which there was a continuous decline to only 26 per cent in 1935.

TABLE 8

GERMAN IMPORTS OF ASBESTOS FROM PRINCIPAL COUNTRIES, 1930 TO 1935
(In thousands of Reichsmarks. R.M.1 is approximately equal to \$0.40)

(From Report prepared by Paul Sykes, Canadian Trade Commissioner,
and published in *Commerce Intelligence Journal*, August 1st, 1936)

EXPORTING COUNTRY	1930	1931	1932	1933	1934	1935	GRAND TOTALS	PERCENTAGE OF GRAND TOTALS
Soviet Russia.....	951	608	691	1,040	2,505	2,796	8,591	30.50
Canada.....	3,186	1,723	972	1,160	1,270	1,287	9,598	34.07
British South Africa.....	2,861	1,323	573	1,183	1,163	1,261	8,364	29.69
Other.....	582	256	113	268	208	191	1,618	5.74
TOTALS.....	7,580	3,910	2,349	3,651	5,146	5,535	28,171	100.00

TABLE 9

TOTAL IMPORTS OF ASBESTOS INTO GERMANY AND IMPORTS FROM CANADA,
1913 AND 1924-1935

(In thousands of Reichsmarks. R.M.1 is approximately equal to \$0.40)

(From Report prepared by Paul Sykes, Canadian Trade Commissioner, and
published in *Commercial Intelligence Journal*, August 1st, 1936)

YEAR	TOTAL IMPORTS		IMPORTS FROM CANADA		PERCENTAGE FROM CANADA	
	METRIC TONS	R. M. 1,000	METRIC TONS	R. M. 1,000	QUANTITY %	VALUE %
1913.....	14,660	5,451	7,114	2,846	48.5	52.2
1924.....	6,711	9,046	3,660	4,479	54.5	49.5
1925.....	12,161	15,334	4,825	5,549	39.7	36.2
1926.....	8,965	11,732	4,200	6,089	46.8	51.9
1927.....	15,941	16,020	9,304	9,158	58.3	37.1
1928.....	17,728	9,208	9,919	4,805	56.0	32.2
1929.....	14,884	8,304	9,613		64.5	
1930.....	14,108	7,580	6,537	3,186	46.3	42.0
1931.....	9,808	3,910	5,067	1,723	51.6	44.0
1932.....	7,581	2,349	3,481	972	46.0	41.4
1933.....	12,613	3,651	5,052	1,160	40.0	31.8
1934.....	20,154	5,146	5,848	1,270	29.0	24.7
1935.....	21,885	5,535	5,684	1,287	26.0	23.2

TABLE 10

IMPORTS OF UNMANUFACTURED ASBESTOS INTO PRINCIPAL COUNTRIES OF WORLD,
1933-35 (Less Re-Exports)(From *The Mineral Industry of the British Empire and Foreign Countries: Statistical
Summary, Production, Imports, and Exports, 1933-35*)

(Long tons)

IMPORTING COUNTRY	1933	1934	1935
BRITISH EMPIRE:			
United Kingdom.....	24,365	26,546	31,681
British India.....	1	951	1,135
Australia.....	2,676	2,471	4,423
FOREIGN COUNTRIES:			
Austria.....	1,246	1,159	2,696
Belgium Luxembourg, E. U.....	13,812	10,626	11,933
Bulgaria.....	4	3	6
Czechoslovakia.....	2,173	4,860	3,349
Denmark.....	707	1,023	2,084
Estonia.....	31	23	33
Finland (including mica) (c).....	67	84	214
France.....	14,127	10,059	11,937
Germany.....	12,414	19,836	21,540
Greece.....	54	75	89
Hungary.....	769	617	(a)
Italy.....	3,607	8,288	5,054
Latvia.....	46	22	87
Lithuania.....	80	20	21
Netherlands.....	548	283	420
Norway.....	958	745	840
Poland.....	541	797	869
Portugal.....	126	340	563
Roumania.....	100	120	95
Spain.....	5,964	4,628	4,957
Sweden.....	1,044	1,676	3,530
Switzerland (including mica).....	824	771	1,034
U.S.S.R. (Russia).....	27	114	37
Yugoslavia.....	339	866	1,585
Algeria.....	40	36	44
Egypt.....	88	95	145
Mexico.....	349	(a)	265
United States (b).....	106,733	107,441	148,739
Brazil (c).....	37	37	31
Chile.....	47	27	1
Colombia.....	28	37	39
Venezuela.....	22	37	2
China.....	576	575	555
Iraq (years ended March 31 of the following year).....	272	(a)	(a)
Japan (total imports).....	13,546	20,191	21,287
Korea.....	(a)	89	179
Manchoukuo.....	582	1,271	1,691
Netherlands East Indies.....	12	14	51

(a) Information not available.

(b) (United States) Re-exports of unmanufactured were 13, 172, and 5 long tons in 1933, 1934, and 1935, respectively.

(c) Total imports.

TABLE 11

WORLD PRODUCTION OF ASBESTOS, 1933-35

(From *The Mineral Industry of the British Empire and Foreign Countries: Statistical Summary, Production, Imports, and Exports, 1933-35*).

(Long tons)

PRODUCING COUNTRY	1933	1934	1935
BRITISH EMPIRE:			
Southern Rhodesia.....	26,948	28,762	38,034
Union of South Africa:			
Amosite.....	2,569	2,552	4,031
Blue.....	2,441	2,413	2,097
Chrysotile.....	10,175	11,186	12,105
CANADA:			
Chrysotile (b).....	147,153	143,439	190,618
Crude.....	1,166	1,485	2,034
Fibre.....	73,754	69,165	91,313
Shorts.....	66,479	68,618	94,570
Sand and gravel (waste rock only).....	5,754	4,171	2,701
Actinolite.....		27	
Cyprus.....	3,494	7,081	7,493
India.....		25	63
Australia.....	270	170	170
Total, British Empire.....	193,000	196,000	255,000
FOREIGN COUNTRIES:			
Bulgaria.....		3	3
Czechoslovakia.....	1,200	2,100	2,600
Finland.....	2,311	3,629	(a)
France.....	400	400	(a)
Greece.....	14	30	(a)
Italy.....	3,215	2,216	(a)
U.S.S.R. (Russia).....	73,000	91,000	100,000
United States (sales).....	4,479	5,843	8,406
Brazil.....	97	(a)	(a)
China.....	232	285	(a)
Japan (estimated).....	1,000	1,000	1,000
Korea.....	12		6
Manchoukuo.....	104	(a)	(a)
Turkey.....	118	4	102
Total, Foreign Countries.....	86,000	107,000	119,000
WORLD'S TOTAL.....	279,000	303,000	374,000

(a) Information not available.

(b) Sales and shipments.

TABLE 12
 EXPORTS OF UNMANUFACTURED ASBESTOS FROM VARIOUS COUNTRIES,
 1933-1935)
 (Domestic Produce)
 (From *The Mineral Industry of the British Empire and Foreign Countries: Statistical Summary, Production, Imports and Exports, 1933-35*).
 (Long tons)

EXPORTING COUNTRY	1933	1934	1935
BRITISH EMPIRE:			
United Kingdom.....	498	418	205
Southern Rhodesia.....	26,887	28,626	40,435
Union of South Africa.....	14,307	15,565	21,173
Canada.....	133,033	141,290	178,760
Cyprus.....	4,567	7,590	7,513
FOREIGN COUNTRIES:			
Austria.....	162	85	106
Belgium-Luxemburg, E. U.....	2,745	803	202
Czechoslovakia.....	507	545	353
Finland.....	(a)	(a)	1,246
Germany.....	234	187	217
Italy.....	1,209	497	(a)
Netherlands.....	4	5	50
Poland.....	43	35	32
Sweden.....	26	5	30
Switzerland (including mica).....	5	20	11
U.S.S.R. (Russia).....	21,119	33,279	24,713
United States.....	1,230	1,490	759
Japan.....			3,020
Manchoukuo.....	70	94	146

(a) Information not available.

MINING OPERATIONS IN 1936

Returns of sales of asbestos were received from seven companies, as follows:

Asbestos Corporation, Limited, Thetford Mines
 Bell Asbestos Mines, Limited, Thetford Mines
 Canadian Johns-Manville Company, Limited, Asbestos
 Keasbey & Mattison Company, Thetford Mines
 Johnson's Company, Thetford Mines
 Quebec Asbestos Corporation, Limited, East Broughton
 Nicolet Asbestos Mines, Limited, Norbestos

Asbestos Corporation, Limited

Reflecting the greatly improved conditions in the asbestos mining industry, employees in the mines and mills of the Asbestos Corporation increased during the year from 450 to 1,500. At present, 9,000 tons of rock per day are being hoisted from the four operating mines.

King Mine:

At the King mine, which is operated by the block-caving system, mining was carried on in stopes 503, 505 and 515. The development of stope 504 was completed and in September it will be placed in production. Stopes 502 and 508 are being developed. During the year, a vertical shaft

was sunk from the 500-foot level to the 700-foot horizon, where a new level was established and lateral work commenced. Drifts and galleries aggregating 8,583 feet were driven, bringing the total footage of underground work completed since 1930 to 646,760 feet, or 12.26 miles.

Beaver Mine:

From January 1st to June 4th, a small crew of men were working at the Beaver mine, recovering both crude asbestos fibre and chromite. In May, the mine was placed in production and from then onward it was in continuous operation.

British Canadian Mines (Black Lake):

On June 16th, general repairs to the mill and plant at this property were commenced, and on September 15th, the mine went into operation. It had been idle since the beginning of 1931.

Vimy Ridge Mine:

On March 30th, this mine was placed in operation and it continued working at full capacity until the end of the year.

Bennett Martin Mine (Thetford Mines):

The Bennett Martin mine was reopened in June, for the recovery of crude, after having remained closed since 1923.

Bell Asbestos Mines, Limited

Late in the year, a new Company, Bell Asbestos Mines, Limited, was formed and acquired the mine and plant of the Keasbey and Mattison Company. The new Company took possession of the mine on December 1st, 1936. Mr. O. C. Smith is president; Mr. H. A. Smith, vice-president; and Lieutenant-Colonel George W. Smith, secretary-treasurer.

The work of stripping the overburden from the surface rock on the north side of the pit was pushed actively. A third steam-shovel was placed in operation in the pit. Development of the mine by underground methods was also commenced. A main gallery is being driven on the 500-foot level and from it, at various points, drifts are being opened to determine the quality of the ore in this section of the property.

Canadian Johns-Manville Company, Limited

On March 1st, the output of the mine was increased 25 per cent. The work of removing the overburden on the west and east sides of the property was continued.

Considerable changes were made in mill equipment, but they were effected without interrupting production. Plans for further increasing the capacity of the existing mills are now being studied.

Johnson's Company

Early in April, the Johnson's Company commenced, at their Thetford property, the driving of an incline tunnel to be used for hauling ore from the mine to the surface. This was completed by the end of the year. Some drilling was also done on this property, on lot 27, range VI. Three Calyx drills were used and at the end of the year holes aggregating 2,747 feet had been drilled. A storage shed for bagged asbestos was erected. Its dimensions are 100 feet by 130 feet, and 40 feet high.

Prospecting work was started on lot 26, range X, of Ireland township. Results, so far, have been encouraging.

Johnson's Black Lake mine was in operation from May 1st to December 31st. During the first four months of this period, operations consisted in the hoisting to the surface of barren rock that had fallen into the pit as the result of a slide which took place in the past years, while the mine was closed down.

Quebec Asbestos Corporation, Limited

After having been closed down for the winter months, this mine, at East Broughton, was re-opened in the spring and remained active for the rest of the year, both the mine and mill operating at full capacity. Extensive stripping operations were carried on throughout the year.

Nicolet Asbestos Mines, Limited

No rock was milled at the Nicolet mine, at Norbestos. In October, 1936, an extensive programme of diamond drilling was commenced on this property.

Northern Asbestos Company

The mill of this Company, which for many years had treated tailings from one of the large mills, to reclaim the short fibre left in the serpentine sands, was dismantled during the year.

THE ASBESTOS INDUSTRY IN OTHER COUNTRIES

SOUTHERN RHODESIA:

The Annual Report for the year 1936 of the Southern Rhodesia Chamber of Mines gives the total production of asbestos in Southern Rhodesia during 1936 as 56,346 short tons, valued at £836,468. Since production commenced, in 1908, total output has amounted to 559,482 short tons, valued at £12,535,843.

UNION OF SOUTH AFRICA:

Table 13, reproduced from the Annual Report of the Government Mining Engineer, Pretoria, for the calendar year ended 21st December, 1936, gives particulars of the sales of amosite, chrysotile, and blue asbestos in the Union of South Africa for 1936, with comparative totals for 1935. As will be noted, sales of each class of asbestos were higher than in 1935, and totalled 25,236.576 short tons, valued at £337,229. Corresponding

figures for 1935 were 22,707.734 tons and £226,167. Regarding the future, the report says: "The prospects for the coming year point to a considerable increase in production, and the possible re-opening of mines which were considered unpayable at the prices prevailing in 1935".

TABLE 13
ASBESTOS PRODUCTION IN THE UNION OF SOUTH AFRICA, 1935-36
(From *Ann. Rept., Gov't Mining Engineer, Pretoria, 1936*)

PROVINCE	AMOSITE		CHRYSOTILE		BLUE		TOTAL	
	Tons	Value	Tons	Value	Tons	Value	Tons	Value
Transvaal...	4,823.298	£ 80,701	16,149.175	£ 159,156	215.838	£ 4,413	21,188.311	£ 244,270
Cape.....	.....	.....	.....	.....	4,048.265	92,959	4,048.265	92,959
Natal.....	.....	.....	.....	.....	.....	.....	.....	.....
TOTALS 1936	4,823.298	£ 80,701	16,149.175	£ 159,156	4,264.103	£ 97,372	25,236.576	£ 337,229
YEAR 1935..	4,693.762	£ 46,170	15,483.270	£ 136,268	2,540.702	£ 43,729	22,707.734	£ 226,167

The classification of chrysotile sold is as follows:

Crude No. 1.....	87,000	short tons
Crude No. 2.....	.....	"
Crude run-of-mine.....	133,700	"
Spinning fibre.....	1,350,975	"
Shingle fibre.....	6,831,200	"
Paper stock.....	5,966,475	"
Millboard stock.....	1,779,825	"
Fillers.....	.....	"
Floats.....	.....	"
TOTAL.....	16,149.175	short tons

CYPRUS :

"The Amiandos mine is included in a lease area held formerly by the Cyprus and General Asbestos Company, Limited, and was transferred during the year under report to the Tunnel Asbestos Cement Company, Limited.

"Operations were intensified, and several new quarries were opened. The output of graded fibres amounted to 9,506 tons, an increase of nearly 2,000 tons compared to the previous year. During the first half of 1936, production was hindered owing to an abnormally wet spring, the asbestos-bearing rock being only amenable to treatment when in dry condition.

"Six primary mills and one fibre mill were in operation during the year, the tonnage of rock treated amounting to 290,472 tons while 1,421,229 tons of rock was actually quarried. The Company contemplated the re-conditioning of two more primary mills, which are expected to be in operation in 1937". (J. A. Bevan, Inspector of Mines and Labour, Cyprus).

RUSSIA :

"The growth of output in the Bazhenov district, in the Urals, may be gauged from the fact that already, in 1930, it produced 54,000 tons of asbestos, two and a half times as much as in 1913, while in 1936 the out-

put reached 125,117 tons. Second place is held by Eastern Siberia. Asbestos is also found in the North Caucasus, the South Urals, Kazakhstan, Central Asia, and elsewhere. In 1936 exports of Ural asbestos amounted to 28,317 tons, compared with 12,389 tons in 1913. The Soviet asbestos industry is taking measures to improve the quality of the asbestos produced; production in the Bazhenov mines has been completely mechanized and new concentration plants have been built". (American-Russian Chamber of Commerce).

JAPAN :

"The Miyoshi Asbestos Mining Company is now in position to make the first shipment of 100 tons of asbestos from Manchuria to Japan, to be followed by another shipment of the same amount, according to the press (November, 1936). Operating at present two mining areas, the daily output of the Company is about seven tons". (United States Department of Commerce).

"It is of interest to note that shipments to Japan from Russia decreased during the year 1935, when compared with those of the two previous years. Manchukuo is a new source of supply, and although the length of fibre compares favourably with Canadian top grades, at the same time it is very harsh and suitable only for use in the manufacture of low-grade products... The demand in Japan for asbestos fibre has increased annually during the past five years, rising from 8,385 short tons in 1932 to 23,792 tons in 1935". (Commercial Intelligence Journal, Department of Trade and Commerce, Ottawa).

UNITED STATES :

"Domestic production of asbestos (unmanufactured) amounted to 10,845 short tons in 1936, compared with 9,415 in 1935, an increase of 15.2 per cent. The quantity sold or used by producers in 1936 (11,012 tons valued at \$309,994) increased 23.5 per cent in quantity and 5.8 per cent in value over 1935. Most of that sold was short-fibre chrysotile from Vermont. Amphibole asbestos was mined in Maryland, Montana, and North Carolina". (Advance Summary Report, United States Bureau of Mines, April 13th, 1937).

FELDSPAR

Shipments of feldspar in 1936 totalled 8,115 tons valued at \$75,703, against 7,002 tons valued at \$63,075 in 1935.

The production of this mineral has for many years been confined to the Buckingham area, in Papineau county. Sales of feldspar were reported from ten properties. Of these, the Derry mine in Derry township, the Poltimore and the Perkins mines in Portland township and the Cameron mine in Buckingham township, were the main producers. A deposit of white high-potash feldspar, situated near the High Rock apatite mine at Notre-Dame-de-la-Salette, was opened during the year by *W. A. and A. D. Cameron*, of Buckingham. About 1,000 tons of feldspar from this deposit were marketed in 1936. The price of crude feldspar delivered at Buckingham fluctuated but little during the year; the average was \$5.60 a ton.

Feldspar deposits of good quality are known to occur in other parts of the Laurentian plateau, but, owing to the low value of the crude material, it has not been found profitable to work them.

Practically all of the output of high-potash feldspar was shipped to the grinding plants of the *Canadian Flint and Spar Company*, at Buckingham, and of the *Consolidated Feldspar Corporation*, at Rochester, New York. The soda spar was shipped mainly to the grinding unit of *Bon Ami, Limited*, at Montreal East.

The Quebec feldspar output is used mostly in the ceramic and scouring-soap industries. A small tonnage of hand-picked high-grade spar is used in the manufacture of artificial teeth.

GRAPHITE

No mining or development work was carried on at any of the Quebec graphite mines in 1936. Owing to unfavourable market conditions, and to an abundant supply of graphite from other sources, the production of this mineral will not likely be resumed in this Province for several years to come.

KAOLIN (CHINA-CLAY)

No sales of kaolin were recorded in 1936. In the preceding year, shipments of a small tonnage of kaolin were reported by *Canadian Kaolin Silica Products, Limited*. The material was obtained as a by-product in the extraction of silica from a kaolin-bearing quartzite deposit at Saint-Remi, in Amherst township.

The plant of the *Canadian China Clay Company, Limited*, in Amherst township, was idle throughout the year.

LIME, LIMESTONE, AND MARL (INDUSTRIAL)

Practically all the limestone produced in Quebec and used for industrial purposes is of the high-calcium variety, the calcium carbonate content being generally well above 90 per cent. Industrial limestone is used in the crude or calcined state for a variety of purposes, but mainly in the manufacture of calcium-carbide and products derived therefrom, in pulp and paper manufacturing, for agricultural purposes, and in chemical works.

Limestone for such uses is quarried on a large scale in the Eastern Townships, at Bedford and Limeridge; in the Saint-Lawrence and Ottawa valleys, in the vicinity of the cities of Hull, Montreal, and Joliette, and at Saint-Marc-des-Carrières; in Gaspé peninsula, at Nouvelle; and in the Lake Saint-Jean district, at Mistassini.

In 1936, the total quantity of industrial limestone used as such or in the form of quicklime or hydrated-lime was 339,742 tons, against 302,066 tons in 1935. Of this total, 135,554 tons, valued at \$149,909, was used as crude limestone, and the balance in the production of 90,273 tons of quicklime valued at \$521,428 and 31,381 tons of hydrated-lime valued at \$109,008. Data relating to building lime and limestone are given on page 45, in the section dealing with *Building Materials*.

Dolomite and dolomitic limestone, used mainly as an ingredient in the manufacture of glass and as a filler, was produced at L'Annonciation in Labelle county, and at Portage-du-Fort in Pontiac county.

Much of the lime carbonate used in Quebec as a soil amendment is obtained from marl deposits. In addition to calcium carbonate, most of these deposits carry a low percentage of magnesium carbonate and organic matter. All of these ingredients are of benefit to the soil. Furthermore, as they are extremely finely divided, they are readily absorbed.

Marl deposits are known in a few localities in the Eastern Townships and at many points in the Laurentian plateau, notably in Argenteuil and Chicoutimi counties. However, the exploitation of marl is at present limited to Gaspé peninsula, where approximately 27,186 tons, valued at \$10,874, were used during the year, against 18,962 tons valued at \$12,325 in 1935.

QUANTITY AND VALUE OF INDUSTRIAL LIMESTONE PRODUCTS SOLD IN
1935 AND 1936

CLASSIFICATION	1936		1935	
	QUANTITY (Tons)	VALUE \$	QUANTITY (Tons)	VALUE \$
Flux.....	2,541	\$ 3,680	3,502	\$ 8,385
Pulp and paper mills.....	92,137	83,123	77,212	63,947
Agricultural limestone.....	34,987	51,061	42,094	60,881
Dusting coal mines.....		175		381
Other industrial uses.....	5,889(1)	12,045(1)	1,800(2)	10,642 (2)
TOTAL.....	135,554	\$149,909	124,783	\$144,236

- (1) Glass factories, poultry grit and unspecified.
(2) Glass factories and unspecified.

DISTRIBUTION OF THE PRODUCTION OF INDUSTRIAL LIME IN 1935 AND 1936
(In tons)

CLASSIFICATION	1936		1935	
	QUICK- LIME	HYDRATED LIME	QUICK- LIME	HYDRATED LIME
Carbide and other chemical products.....	33,408	4,307	26,738	3,230
Sugar refineries.....	59	396		155
Tanneries.....	691	319	141	258
Pulp and paper mills.....	54,243	22,125	53,602	18,452
Agricultural uses.....	3	808		977
Foundries.....	1,878	3,426	1,488	
TOTAL.....	90,273	31,381	81,969	23,072

MAGNESITIC-DOLOMITE

Magnesitic-dolomite marketed or used in the crude, calcined, or dead-burned state was valued at \$768,742, as compared with \$486,084 in 1935. This is the highest value recorded in any year except 1918, when sales of magnesitic-dolomite totalled \$1,016,764 at the war prices which then ruled. The continued progress made by this industry is in part a result of greater activity and expansion of the metallurgical industry, but in large measure it has been brought about by the marketing of new refractory products.

Canadian Refractories, Limited, at Kilmar in Grenville township, and the *International Magnesite Company* in Harrington township, were the only producers.

In the fall of 1936, open-cast mining methods were definitely abandoned by Canadian Refractories, Limited. In the past two years, this Company had introduced underground mining methods as an extension of its open-cast operation. The open-pit had a maximum depth of 190 feet. The south, east, and west walls were practically vertical and were not worked; the north face was mined in twenty-foot benches. Then, from the bottom of the pit, two adits were driven into the ore-body, one to the north and the other to the south, and mining was carried on underground by the shrinkage stoping system. Derricks were used to hoist the hand-sorted ore and waste rock from the bottom of the pit to the surface. Late in 1936, the sinking of a three-compartment shaft was commenced, its initial objective being 420 feet. It is anticipated that underground work will add to the safety of mining operations. It will give access to a large tonnage of ore that could not be reached by surface work, and it is expected that mining costs will be appreciably reduced, as the large quantity of waste rock that heretofore had to be hoisted from the open pit will in future be left underground as pillars.

At the International Magnesite Company's property, a certain amount of trenching and other surface exploration work was done in addition to regular mining operations in the main open-pit.

Magnesitic dolomite is used in the dead-burned state, alone or combined with chromite and other refractory materials, as a basic lining in metallurgical furnaces and kilns. As caustic calcined magnesitic-dolomite, it is used for fettling the bottoms of basic open-hearth furnaces, and as a building material in the construction of floors and manufacture of floor tiles.

A report entitled *Magnesitic-Dolomite Deposits, Grenville Township*, by F. Fitz Osborne, will be published in Part C of the Annual Report of the Bureau for 1936.

MICA

Owing to lack of demand for certain mica products, to low prices, and to the scarcity of mica in some of the operating mines, the production decreased in 1936 to 544,214 pounds valued at \$63,123, as compared with 745,790 pounds valued at \$74,894 in 1935. The stiffening of prices at the close of the year has led to a renewal of activity in several mines and to the reopening of others which had been idle for several years. It seems probable, therefore, that in 1937 the Quebec mica industry will recover some of its former importance.

For many years, the bulk of the Quebec output of mica has come from a large deposit in Templeton township, operated by *Blackburn Brothers, Limited*, of Ottawa. During 1936, a new shaft was sunk at the north end of the mine and lateral work was carried on from this shaft with the object of locating the extension of the main ore-body and parallel leads. In the fall of 1936, Blackburn Brothers acquired and reopened the Vavasour mine, in Hull township. This well known property was worked extensively for phosphate over fifty years ago and for mica in the years preceding the world war. In conjunction with its mica-mining business, this firm

operates a mica grinding unit at the Blackburn mine and a mica trimming plant in Ottawa.

Phlogopite, or amber mica, was mined also by *A. G. Martin*, at the Dacey property in Hull township, and at the Kodak mine in Wakefield township; by *Ed. Wallingford*, in Templeton township; and on a small scale by several other operators in the Gatineau River district. The only producer of phlogopite outside of this area was *François Bazinet*, who shipped a small quantity of light amber mica from a mine in Joliette township.

This year's output includes a few hundred pounds of sheet mica taken by *Eugene Simard* from a muscovite deposit discovered in the fall of 1936 on the north shore of Sirois lake, in Bergeronnes township. The muscovite occurs in a pegmatite dyke of considerable length and from fifteen to twenty feet wide, which carries a high percentage of clear mica in rather small sheets and occasional small pockets of large crystals of marketable value.

The Pied-des-Monts muscovite deposit, in DeSales and Lacoste townships, was prospected by surface and underground development work conducted by the *Charlevoix Radium Exploration Syndicate, Limited*. A small quantity of mica was taken out in the course of this work, but none of it was marketed.

Shipments of mica in 1936 and 1935 were as shown in the accompanying table. Practically the whole of the 1936 production of dressed mica was knife-trimmed.

SHIPMENTS OF MICA, 1935 AND 1936

DESCRIPTION	1936	1935
Splittings.....	24,100 lb	32,150 lb.
Trimmed mica.....	109,902 "	110,657 "
Ground and serap mica.....	410,212 "	602,983 "
TOTAL.....	544,214 lb.	745,790 lb.

Dealers' quotations, furnished by the Federal Department of Mines and Resources, were as follows at the close of the year:

KNIFE-TRIMMED SHEET:	PER POUND
1 by 3 inches.....	\$0.44
2 by 3 ".....	0.70
2 by 4 ".....	0.95
3 by 5 ".....	1.65
4 by 6 ".....	2.00
5 by 8 ".....	3.00
SPLITTINGS:	PER POUND
1 by 1 inch.....	\$0.45
1 by 2 ".....	0.50
GROUND MICA:	PER TON (in ton lots, f.o.b. Ottawa)
20-mesh.....	\$25.00
60-mesh.....	30.00
120-mesh.....	45.00

OCHRES AND IRON OXIDES

The production of crude and calcined iron oxides was 5,458 tons valued at \$65,630, as compared with 5,357 tons valued at \$75,388 in 1935.

Air-dried ochreous iron oxides are used mainly for the purification of coal gas; the calcined products are used as mineral pigments.

The 1936 output came entirely from the Trois-Rivières area. The crude oxides were extracted from two deposits, one at Pointe du Lac and the other near Almaville. The iron oxides marketed as pigments came from deposits near Champlain and Red Mill and were calcined in the plant of the *Sherwin-Williams Company of Canada, Limited*, at Red Mill.

The development of a recently discovered deposit which lies on the west bank of the Rouge river, in Marchand township, was started in 1936 by *Iron Oxides Products, Limited*. Several thousand feet of trenches were dug over the deposit for drainage purposes. The construction of a mill was under way at the end of the year.

PEAT *

In 1936, sales of peat amounted to 295 tons, valued at \$7,106. Moss peat, for use as insulating material, constituted the main production. Next in importance was material for use in agricultural operations for soil improvement, and as litter. A small tonnage of peat fuel was produced by the air-drying method.

The Provincial Government has adopted measures to promote research and investigation of the many problems connected with the utilization of our peat resources. By an Act to encourage the development of natural resources suitable for fuel, approved by the Legislature during the last session of 1936, provision is made for an expenditure not to exceed five thousand dollars for peat-fuel development during the coming year.

Insulation, Limited, operated their peat bog on lots 87 to 102, in the Seigniorship of Isle Verte. At this property, the peat is excavated from the bog by hand, in shaped blocks of 20 by 6 by 4 inches, which are stacked along the edge of the working trenches for drying. In the plant, the dry peat is torn to pieces by the use of a thrasher, and the shredded material is packed in bales of one cubic yard. The price f.o.b. Isle Verte is \$1.20 per bale.

Returns of shipments of peat for use as litter and humus were received from *F.-X. Lambert* of Sainte-Anne-de-la-Pocatière, and from *Waterville Moss and Peat Mines*.

Therriault and Malenfant, of Saint-Arsène, Rivière-du-Loup county, commenced production of peat fuel during the summer of 1935. Operations were carried on on lots 27 and 28, part of the Seigniorship of Le Parc, in the parish of Saint-Modeste, where a peat-fuel machine of quite simple type, mounted on a timber platform, has been installed. The raw peat, excavated by hand, is shovelled onto a conveyor belt which feeds a swing-hammer pulverizer. The peat thus macerated is subjected to pressure

* By Henri Girard, Inspector of Mines.

by a revolving screw, and extruded through a rectangular tube for shaping the finished product. The cutting into blocks, 9 by 3 by 3 inches, is done by hand. These blocks are spread upon the ground to dry. Due to the late date of installation of the plant, only 100 tons of peat fuel were manufactured during the season. Peat blocks were sold at the property for \$6.00 per ton.

PHOSPHATE

Sales of apatite, or phosphate rock, in 1936 amounted to 525 tons valued at \$4,927, as compared with 116 tons valued at \$1,043 in 1935. This small output was drawn largely from the High Rock mine at Notre-Dame-de-la-Salette, which was reopened and operated on a modest scale during the winter of 1935-36. The remainder came from other abandoned phosphate mines and from mica mines where the apatite is obtained as a by-product. The whole of the production was shipped to the plant of the *Electric Reduction Company*, at Buckingham, where it was used in the manufacture of phosphorus and phosphorus salts.

QUARTZ AND INDUSTRIAL SAND

Returns received from quartz and industrial-sand producers show that 78,975 tons of silica, valued at \$320,634, were shipped in 1936. This is by far the highest output ever recorded in the Province. The 1935 production was 50,258 tons, valued at \$224,135.

In 1936, *Canadian Kaolin Silica Products, Limited*, added another unit, consisting of a 375 h.p. Diesel engine, to their power plant, thereby greatly increasing the capacity of their mill. There is now available a total of 675 h.p. This Company works, by open-pit methods, a deposit of kaolin-bearing quartzite near Saint-Remi, in Amherst township. The output is marketed mainly for use in glass manufacture, but other products are sand-blasting materials and other abrasives, fillers, silica for use in the ceramic industry, and moulding sand. A detailed description of the geology of the Saint-Remi-d'Amherst area and of the ore deposits of the district is given in a report on the *General and Economic Geology of the Lachute Map-Area*, to be published in Part C of the Annual Report of the Bureau for 1936.

No modifications of importance were made at any of the other silica plants of Quebec in 1936. The *Canadian Carborundum Company* operated their sandstone quarry and grinding mill at Saint Canut, in Argenteuil county, throughout the year. The output of this mill is used almost entirely in the Company's own plants for the manufacture of carborundum and sand-lime brick. Intermittent operations were carried on by *Ottawa Silica and Sandstone, Limited*, at their East Templeton plant, the bulk of the shipments consisting of sand-blasting materials and smelter flux.

In the Buckingham district, quartz was produced by several operators, who obtain the mineral, and also feldspar, from pegmatite dykes. The quartz was shipped to the plant of the *Electric Reduction Company*, at Buckingham, for use as flux in the manufacture of phosphorus, and to the grinding unit of the *Canadian Flint and Spar Company*, also at Buckingham.

The production of 1936 includes shipments of a small tonnage of sand-blasting materials from the Mason mine in Guigues township, and of finely pulverized silica from stocked material produced by *Silica Products of Canada, Limited*. The mine and the grinding plant of the latter Company, located near Lac-Bouchette in Dequen township, were idle in 1936.

TALC AND SOAPSTONE *

There were no new developments in the soapstone industry in 1936. The value of the production of soapstone for the year amounted to \$32,769 as compared with \$32,053 in 1935.

The *Broughton Soapstone and Quarry Company* operated its quarry situated in Broughton township. The Company also continued its campaign of exploration and development on lot 692, range VII, of Bolton township, which had been started in 1935, but the option on this property was later relinquished.

In the spring of 1937 the Broughton Soapstone & Quarry Company began the construction of a small pulverization mill, for the production of ground soapstone.

Other soapstone quarries operated during the year were those of *Charles Fortin*, on the east half of lot 2, range V of Thetford township, and of *L. C. Pharo*, on lots 12 and 13, range III, Thetford township.

BUILDING MATERIALS †

The production of mineral substances classed as building materials had a value of \$6,724,020, very little higher than the \$6,512,764 recorded in 1935. There is a striking correspondence between these figures and those for building and engineering contracts let in the Province of Quebec, which totalled \$45,749,500 in 1936 and \$44,471,900 in 1935.

There was little demand for dimension stone. The value of our output of stone for building and ornamental purposes and for monuments was \$558,754, against \$918,598 in 1935. The inactivity of the building-stone industry was compensated by increased sales of other building materials: cement, 20 per cent increase in value; crushed stone, 13 per cent; clay products, 14 per cent.

Sixty-six quarries produced crushed stone, against sixty-four in 1935. Their combined output was 1,133,998 tons, a slight gain over the 1,001,210 tons reported in 1935.

CEMENT

The *Canada Cement Company* is the only producer of cement in the Province of Quebec. Two of its plants, one at Montreal East and the other at Wrightville, near the city of Hull, were in operation in 1936. Sales amounted to 2,093,130 barrels valued at \$2,945,074, as compared with 1,751,012 barrels valued at \$2,472,008 in 1935. The average market price of cement per barrel, f.o.b. plant, was \$1.407, against \$1.412 in 1935.

* By Eugène Larochelle, Inspector of Mines.

† By Paul-E. Bourret, Inspector of Mines.

The Montreal East and the Hull plants were considerably enlarged and modified a few years ago, to operate by the wet process. This method not only permits the production of better and more uniform cements but it also eliminates most of the dust that was formerly present in and about the plants. The Hull plant has a total daily capacity of 2,500 barrels, and the Montreal East plant of 10,000 barrels. The latter is one of the largest, if not actually the largest, cement plant in the world operating by the wet process.

CLAY AND SHALE PRODUCTS

Domestic clay and shale products, consisting of common and face brick, structural and drain tile, and sewer pipe, were valued at \$691,765, an increase of nearly 17 per cent as compared with the production of 1935, valued at \$591,642. Increases were recorded both in the quantity and value of common and face brick, and structural tile; on the other hand, sales of drain tile and sewer pipe, products which are not used in building work, were much lower than in 1935.

Of the sixteen operators who reported sales of brick, three used ground shale as raw material and the others, superficial clay. Over 80 per cent of the total output of brick was made with ground shale, as compared with 75 per cent in 1935. This increased percentage of shale brick over clay brick reflects, possibly, a slight revival in brick construction in the cities of Montreal and Quebec, where this product is generally used.

The average prices of common brick made by the soft mud process, and of structural tile, were higher than in 1935, but the average selling prices of all other clay and shale products declined slightly.

CLAY PRODUCTS IN 1935 AND 1936

CLASSIFICATION	1936		1935	
	QUANTITY	VALUE	QUANTITY	VALUE
BRICK:				
Face brick, soft mud process..... M	215	\$ 2,364	225	\$ 2,025
Common brick soft mud process... M	2,482	22,056	1,782	12,569
Face brick, stiff mud process..... M	9,803	191,085	6,910	136,975
Common brick stiff mud process... M	18,921	248,647	18,044	252,015
Face brick, dry press..... M	2,161	52,096	1,424	35,559
SUB-TOTAL.....	33,582	\$516,248	28,385	\$439,143
OTHER CLAY PRODUCTS:				
Structural tile..... Tons	16,887	\$135,145	11,894	\$ 87,155
Drain tile..... No	437,985	13,713	539,529	15,895
Sewer pipe.....	.....	26,659	.....	49,449
SUB-TOTAL.....		\$175,517		\$152,499
TOTAL.....		\$691,765		\$591,642

GRANITE

The value of granite products declined from \$800,685 in 1935 to \$429,281 in 1936, due mainly to lack of demand for building and monument stone. Granite is used chiefly in the construction of public and semi-public structures. The volume of contracts issued for such buildings varies much from year to year, which accounts for the great fluctuations in the annual production of this stone.

Building and ornamental granite was extracted for the most part from quarries in the Little Mount Megantic and Stanstead areas; the remainder came largely from Rivière à Pierre and the Lake Saint-Jean district. Among the outstanding buildings in the construction of which Quebec granite was used in 1936 are: the Alliance Nationale building, Montreal, the base of which is faced with Saint-Gédéon black granite and the remainder with Saint-Samuel granite; and the French Legation building, at Ottawa, built entirely of Rivière à Pierre granite.

Over three thousand tons of curbstome, valued at \$21,657, was shipped during the year from quarries at Rivière à Pierre, Guenette, and Stanstead. An unusually large quantity of granite rubble and rip-rap was produced in 1936. Much of this material was used in public works in the townsites under development at Bourlamaque and Comeau Bay. Of the production of 54,865 tons of crushed granite, 25,435 tons valued at \$25,311 was produced in commercial quarries, and 29,430 tons valued at \$39,423 in quarries operated by contractors who, themselves, use the whole of the output.

QUANTITY AND VALUE OF GRANITE SOLD IN 1935 AND 1936

CLASSIFICATION	1936		1935	
	QUANTITY (Tons)	VALUE	QUANTITY (Tons)	VALUE
Building stone, rough.....	2,187	\$ 9,461	5,281	\$ 53,529
Building stone, dressed.....	5,599	171,778	10,015	391,381
Monument stone, rough.....	3,483	25,610	4,095	31,113
Monument stone, dressed.....	2,267	97,210	7,984	174,474
Curbstome.....	3,333	21,657	1,266	8,976
Paving blocks.....	85	754	7,248	66,677
Rubble and rip-rap.....	66,091	38,077	45,944	39,570
Crushed stone.....	54,865	64,734	49,263	34,965
TOTAL.....	137,910	\$429,281	131,096	\$ 800,685

LIME AND LIMESTONE (BUILDING)

The total quantity of limestone quarried in Quebec in 1936 is estimated at 2,063,964 tons, as compared with 1,658,118 tons in 1935. The production was used as follows: 609,947 tons in the manufacture of cement and building lime; 1,114,275 tons in the building trade, as dimension stone, crushed stone, and rubble; and 339,742 tons for industrial purposes. Industrial lime and limestone are now classed with the 'non-metallies' and are dealt with on page 37.

BUILDING LIME:

The quantity of lime sold to the building trade is small as compared with the tonnage used as 'industrial lime'. In 1936, sales under the two classifications were, respectively, 11,404 tons and 121,654 tons. About thirty per cent of the quicklime sold directly to the building trade was calcined in kilns built of field stone and the remainder in more modern plants. The average price of building quicklime was \$9.17 per ton, against an average of \$5.78 per ton for industrial lime. The higher price for building lime is due to several factors: it is often sold in very small quantities; it has to be packed in containers; and only a certain proportion of the output can be sold for the purposes of the building trade.

DIMENSION STONE:

Returns received from quarry operators show that a total of 19,681 tons of building and monument limestone were sold by them in 1936, a slight decrease as compared with 1935, when the total was 22,732 tons; but, whereas in 1935 two-thirds of the output consisted of dressed stone, this year only one-third of the stone was dressed in plants owned by the quarry operators. As in former years, the Saint-Marc-des-Carières and Pont-Viau quarries supplied the bulk of the output.

CRUSHED STONE:

The total output of crushed limestone, from 48 producers, was 990,477 tons valued at \$695,370, an increase of 16 per cent in quantity and of 12 per cent in value as compared with sales during the preceding year. Approximately 87 per cent of the production came from operators who marketed their products.

The average price of crushed limestone for the whole of the Province was \$0.702 per ton, against \$0.727 in 1935. Commercial quarries on the Island of Montreal and on Isle-Jésus reported sales of 630,266 tons at an average price, f.o.b. quarry, of \$0.623 per ton, against 425,269 tons at \$0.579 in 1935. In the City of Quebec district, sales of 68,796 tons of crushed limestone were recorded, and the average price was \$0.829 per ton; this compares with 97,562 tons at \$0.846 per ton in 1935. Sales of crushed limestone by commercial quarries in other parts of the Province totalled 216,941 tons at an average price of \$0.677 per ton.

QUANTITY AND VALUE OF BUILDING LIMESTONE PRODUCTS SOLD
IN 1935 AND 1936

CLASSIFICATION	1936		1935	
	QUANTITY (Tons)	VALUE	QUANTITY (Tons)	VALUE
Building stone, rough.....	12,606	\$ 22,689	7,655	\$ 21,545
Building stone, dressed.....	6,977	123,149	15,012	218,582
Monument stone, rough.....	71	1,407	16	135
Monument stone, dressed.....	27	830	49	1,680
Flagstone.....	299	1,399	407	357
Asphalt filler.....	2,153	5,699	3,451	8,572
Rubble and rip-rap.....	101,665	64,932	122,379	70,017
Crushed stone.....	990,477	695,370	855,582	622,257
TOTAL.....	1,114,275	\$915,475	1,004,551	\$943,145

DISTRIBUTION OF THE PRODUCTION OF BUILDING LIME IN 1935 AND 1936
(In tons)

CLASSIFICATION	1936		1935	
	QUICK- LIME	HYDRATED LIME	QUICK- LIME	HYDRATED LIME
Building trade.....	3,770	398	3,463	108
Dealers.....	2,454	1,233	3,588	1,814
Unclassified.....	2,618	931	1,723	393
TOTAL.....	8,842	2,562	8,774	2,315

MARBLE

Production of domestic marble, as polished slabs, as granules, and in the pulverized state, amounted to 6,091 tons valued at \$120,582, as compared with 6,244 tons valued at \$31,071 in 1935.

The *Wallace Sandstone Quarries, Limited*, at Philipsburg, in Missisquoi county, is the only producer of building and ornamental marble in Quebec. The products of this Company include a variety of light grey marbles, some of which are lined irregularly with green, and also black, marble. They are used extensively throughout Canada for the interior decoration of buildings.

The Wallace Company and two other operators whose quarries are, respectively, at L'Annonciation in Labelle county and at Portage-du-Fort in Pontiac county, produced granulated and pulverized marble. The crushed material has numerous uses, as in the manufacture of artificial stone, for terrazo flooring, and for stucco work.

Statistics pertaining to marble or dolomite used for industrial purposes are included in this report with 'industrial' limestone (page 37).

MARBLE PRODUCTS SOLD IN 1935 AND 1936

CLASSIFICATION	1936	1935
Building and ornamental stone, rough.....	29 tons	130 tons
Building and ornamental stone, dressed.....	937 "	165 "
Crushed marble.....	3,333 "	1,367 "
Rubble and rip-rap.....	1,772 "	4,582 "
TOTAL.....	6,091 tons	6,244 tons

SAND AND GRAVEL

Sand and gravel production for 1936 is estimated at 5,490,280 tons valued at \$1,418,231, an increase of 4 per cent in quantity but a decrease of 1.8 per cent in value as compared with the previous year. As is usual, the great bulk of the output was used in road construction and maintenance. Of notable interest, however, is the large tonnage of gravel used as railway ballast during the year. The average price of washed and screened sand and gravel was \$0.474 per ton in 1936, against \$0.381 in 1935. Corresponding figures for crushed gravel were \$0.496 and \$0.627.

QUANTITY OF SAND AND GRAVEL SOLD IN 1936 AND 1935

CLASSIFICATION	1936	1935
Washed and screened sand and gravel.....	319,898 tons	355,950 tons
Ballast.....	1,075,711 "	351,758 "
Sand and gravel for building, concrete, and road construction and maintenance.....	3,790,413 "	1,208,991 "
Crushed gravel.....	292,362 "	343,485 "
Other sands.....	11,896 "	8,803 "
TOTAL.....	5,490,280 tons	5,268,987 tons

SANDSTONE AND SHALE

Returns received from sandstone quarry operators show that sales of sandstone in 1936 amounted to 92,094 tons valued at \$102,056, as compared with 104,660 tons valued at \$121,864 in 1935.

The production consisted mainly of crushed stone and rubble used in road work. The material was obtained from the quarry owned and operated by the *City of Sherbrooke*; from stocked material accumulated at the stone-crushing plant of the *Beauharnois Light, Heat & Power Company*, at Beauharnois; and from quarries operated by the *Roads Department of Quebec*, or privately owned, situated in the Quebec City district and along the Baie des Chaleurs. Of the total output, 11,945 tons of crushed stone, sold at an average price of \$1.27 per ton, was produced by commercial quarries, and 76,711 tons, valued at \$1.10 per ton, by operators who produced crushed sandstone for their own use.

The production of red and grey slate and shale amounted to 937 tons, valued at \$1,186. The output was derived from waste dumps lying in the vicinity of abandoned slate quarries in the Eastern Townships, and from red shale quarries at Lauzon in Levis county and at Sainte-Hénédine in Dorchester county. The total production was shipped as crude material to pulverizing mills. Finely pulverized shale and slate is used as a filler by various industries.

QUANTITY AND VALUE OF SANDSTONE SOLD IN 1935 AND 1936

CLASSIFICATION	1936		1935	
	QUANTITY (Tons)	VALUE	QUANTITY (Tons)	VALUE
Building stone, rough.....	102	\$192	8,000	\$ 8,359
Building stone, dressed.....			15	488
Rubble and rip-rap.....	3,336	2,588	280	194
Crushed stone.....	88,656	99,276	96,365	112,823
TOTAL.....	92,094	\$ 102,056	104,660	\$ 121,864

MINING OPERATIONS AND DEVELOPMENT IN WESTERN QUEBEC IN 1936

By R.-H. Taschereau, Inspector of Mines

DASSERAT TOWNSHIP

MONARCH MINES, LIMITED

In the summer of 1936, a two-compartment vertical shaft was completed to a depth of 150 feet, and by the end of February, 1937, approximately 1,250 feet of lateral work had been carried out on the 125-foot level. During this period, also, 2,280 feet of diamond drilling was completed, of which 1,867 feet was from underground and the remainder from the surface.

The results attained in this underground work and in the diamond drilling did not indicate continuity to the vein systems. Stringers containing free gold were found in a number of places, but not in sufficient quantity to comprise a commercial ore deposit.

BEAUCHASTEL TOWNSHIP

ALDERMAC COPPER CORPORATION, LIMITED

In 1936, preparations were made to resume production. De-watering of the mine was commenced in June. The shaft was enlarged to three compartments from the 500- to the 1,125-foot level, and new stations were established at the 634- and 924-foot horizons. An ore-pass system was completed to the 750-foot level. Diamond drilling aggregating 2,845 feet was carried out in seventeen holes, and this served to indicate the continuation of the No. 3 ore-body to the 500-foot level. In early 1937, further substantial ore was indicated by drilling between the 500- and the 1,125-foot levels, and plans were made to continue the shaft to the 1,625-foot horizon.

Following improvements in the flow-sheet, the mill was brought into production in January, 1937, on a basis of 250 tons of ore per day. It is planned to increase the capacity to 1,000 tons per day, and the necessary equipment for this purpose has been ordered. Experimental work has been carried out by the Company to perfect a process for producing elemental sulphur from the iron pyrite concentrate. The results have been encouraging, and it is planned to erect a commercial plant at the property.

ARNTFIELD GOLD MINES, LIMITED

The mill was in continuous operation throughout 1936 on a basis of 186 tons of ore per day. During the year, 67,881.3 tons of ore were milled, with recovery of 8,706.75 ounces of gold. The annual report of the Company for 1936 contains the following information:

"The No. 3 shaft was deepened to 1,000 feet, measured on the 45-degree incline. This is equal to a 700-foot vertical depth. Stations were cut and levels opened at 675, 825, and 975 feet. Approximately 1,000 feet of drifting to the east was done on the 675-ft. level and 500 feet on the 825-ft. horizon. A small amount of cross-cutting only was done on the 975-ft. level. Two upper levels, the 375-ft. horizon and the 525-ft., were further extended to east and west. Raising from the 525-ft. horizon provided natural ventilation and a second exit to surface.

"It was found that the ore lies farther to the east on these lower levels, with more drifting required to reach it. The year-end found the 675-ft. East drift face in ore. Twenty-five per cent of the drifting on this level has been in ore. The 875-ft. level had not reached ore at the year-end. Stopping was carried on from the 250-, 375-, and 525-ft. horizons and some stope preparation was done on the 675-ft. level.

"No. 2 shaft was being de-watered at the year-end, with a view to resumption of mining there early in 1937. Of the total diamond drilling, 5,529 feet were drilled from surface and 10,971 feet underground at No. 3 shaft. A good deal of ore was indicated in this way, although to date all drilling away from the main shear-zone has been unproductive.

"ORE RESERVES:

"More new ore was placed in sight than was milled during the year. The grade of the lower levels, however, was considerably lower than the average of previous reserves, necessitating a downward revision in the average grade of reserves, coupled with a higher tonnage. Assured and reasonably assured ore reserves at both shafts, as of Dec. 31, 1936, are calculated as 123,800 tons averaging 0.162 oz. per ton in gold, including 6,400 tons broken and on dumps. The above ore is all above the 675-ft. horizon. The ore-reserve figures are based on the exposures in levels, raises, and stopes, together with close drilling. Further ore, indicated by diamond drilling only, is not included".

FRANCOEUR GOLD MINES, LIMITED.

During the first six months of 1936, underground work was continued in the No. 1 shaft workings. The results were not promising, and operations in this area were suspended. A geological study of the surface was carried out, and, as a result, a programme of diamond drilling was mapped out to the west of the shaft. This drilling was rewarded with the development of two new ore-shoots, and the prospects for the property are very bright.

The annual report of the Company for the year ending Dec. 31st, 1936, contains the following information:

"Three distinct ore-bearing sections have been found to occur in a strong shear-zone which extends across the property in a general east-west direction. These are about 2,000 feet apart. They are referred to as numbers 1, 2, and 3 areas, respectively, number 1 being the most easterly.

"*No. 1 Area.*—Underground work was carried on in this area until June 30th. There is estimated to be 35,000 tons of ore, having an average grade of 0.25 oz. Au, indicated in the No. 1 ore-body east of the shaft. Additional ore is indicated in a small shoot on the 5th level west, where a length of 90 feet averaging 0.42 oz. Au across 9.2 feet has been opened up. This shoot has not been developed to a point where tonnage calculations can be made.

"*No. 2 Area.*—Diamond drilling from surface, about 2,000 ft. west of No. 1 shaft, disclosed the presence of an ore-shoot 900 feet long. This body was drilled at intervals of 100 feet to a vertical depth of 100 feet and five holes were put down at the east end of the body to a depth of 200 feet. Two additional holes were drilled to depths of 300 feet and 500 feet in the plane of the proposed shaft.

"It was decided in October to sink a three-compartment inclined shaft to develop the No. 2 ore-body, and to equip this operation with an electrically operated mining plant and permanent camp buildings. The equipment consists of a 900 cu. ft. compressor and a 42 by 36 double drum hoist, together with the necessary electrical equipment.

"Sinking through overburden commenced in November and the shaft was collared in bedrock at the end of December at an inclined depth of 54 feet. Considerable trouble and delay was experienced in reaching bedrock due to the pressure which was exerted by the soft clay and quicksand at this depth. A total of 1,045 cu. yd. of clay was excavated.

"*No. 3 Area.*—By December 31st, diamond drilling approximately 2,000 feet west of No. 2 area had given intersections in three holes which indicated the possible presence of an ore-body. Borings completed since that date indicate that this area may yield important quantities of ore".

HALLIWELL GOLD MINES, LIMITED

This Company resumed operations in June, 1936. New camps were constructed. A diamond-drilling programme was commenced and, at the end of the year, 7,300 feet of drilling had been completed. Some promising gold and copper values were encountered in this work, and plans were made to sink a three-compartment vertical shaft to further explore and develop the deposits. The shaft is located close to the original discovery on claim T-3804.

At the end of the year, an electric power line had been completed to the property, and the installation of mining equipment was under way. In the spring of 1937, the shaft was completed to a depth of 500 feet, and lateral work was commenced.

ROUYN TOWNSHIP

ADANAC-QUEBEC MINES, LIMITED

This Company is a reorganization of Adanac Gold Mines, Limited. In 1936, the shaft was deepened from the 250- to the 500-foot horizon, and about 500 foot of drifting and cross-cutting was carried out on the 500-foot level. A small amount of diamond drilling was also completed. Operations were suspended toward the end of the year.

ASTORIA ROUYN MINES, LIMITED

In the fall of 1936, some trenching was carried out on this property, and a test-pit was sunk to a depth of about 30 feet. It is reported that this work was attended with encouraging results, and preparations were made to sink a shaft near the east boundary of claim T-329.

CLERNO MINES, LIMITED

This Company was incorporated in 1936 with a capitalization of 3,000,000 shares of no par value stock. It holds the mining rights to a group of nine claims lying to the west of the McWatters mine. A diamond-drilling programme, totalling 4,044 feet, was completed in fifteen holes. It is reported that gold values were encountered, and the sinking of a two-compartment vertical shaft was commenced on claim R-11609, close to the McWatters west boundary.

Light mining equipment, including an 8 inch by 10 inch reversible hoist and a 320 cubic foot gasoline compressor, was installed. The shaft was carried to a depth of about 117 feet and, by the end of the year, some 400 feet of lateral work had been completed on the 100-foot level. No important developments were recorded in the underground work.

GRANADA GOLD MINES, LIMITED

During 1936, this Company resumed operations for a short period. The No. 3 shaft was de-watered and was continued to a depth of about 350 feet. Early in 1937, an electric mining plant was installed, and plans were made to continue underground operations.

KEYROC GOLD MINING COMPANY, LIMITED

This Company holds the mining rights to a group of seventeen claims situated in the centre of Rouyn township. The claims are numbered as follows: R-11967 to 11970, 25886 to 25889, 28096, 28097, 30323, 30328 to 30330, and 30332 to 30334. During the summer and fall of 1936, a two-compartment shaft was sunk on claim R-11968 to a depth of 143 feet, and a small amount of lateral work was carried out on the 125-foot level. It is reported that a quartz vein, well mineralized with pyrite, was encountered forty feet to the south of the shaft, but the gold content was disappointing and operations were suspended. In early 1937, a diamond-drilling programme was commenced.

MCWATTERS GOLD MINES, LIMITED

During 1936, 33,229 tons of ore and 10,404 tons of tailing from previous milling operations were milled, and 16,570 ounces of gold were produced. Most of the ore came from stopes above the 180-foot level. At December 31st, 1936, the ore reserves were estimated at 50,000 tons averaging 0.485 ounces gold per ton.

Exploration work was continued throughout the year. A winze was sunk to a depth of 64 feet below the 400-foot level, to explore some diamond-drilling intersections, and the driving of a long cross-cut to explore the north

contact of the sediments was completed at the end of the year. The annual report of the Company for 1936 contains the following information relative to development:

“The main development work undertaken during the year was the probing of the north contact of the sediments by a series of diamond-drill holes from surface, and the driving of a 1,000-foot cross-cut to this area on the 400-foot level. At this writing, the vicinity of one of these drill holes has been reached and encouraging results have been obtained. In the limited amount of work done to date, ore is indicated. It is too early to form any idea of tonnage. There is over 1,500 feet of favourable ground on this north contact to be explored.

“On the south contact, in the shaft area, the ground to the east was probed by drifting, cross-cutting, and diamond-drilling. No ore was encountered. Diamond drilling from the 460-foot level, to a depth of from 600 to 900 feet, is now under way.

“Only a limited area of the known potential ore section of the property has been explored. Sections east and west of the present workings, as well as north, offer chances for location of ore-bodies”.

Dividends totalling ten cents per share were declared during 1936.

NORANDA MINES, LIMITED

The annual report of Noranda Mines, Limited, for the year 1936 contains the following account of operations at the Horne property:

“MINE:

“The new No. 5 shaft was enlarged to full size and timbered from a depth of 2,164 to 3,024 feet; and was sunk from there to a depth of 3,532 feet. No. 3 shaft was deepened from 2,527 to 2,754 feet.

“Also, 6,189 feet of drifting, 1,764 feet of raising in rock, and 45,153 feet of diamond drilling, was done, and 148,858 cubic feet of rock was excavated in cutting stations, ore pockets, and ore passes.

“Very little lateral exploration work was undertaken during the year, as most of the men and drills normally employed on exploration work were required for the shaft-sinking programme and the cutting of crusher station ore pockets, and ore passes to serve No. 5 shaft. It is expected that this new shaft will be completed to a depth of about 4,100 feet by midsummer, after which the exploration of the block of ground between the 2,975 and 4,000-foot levels will be undertaken. This exploration programme will involve extensive lateral openings and diamond drilling, first on four levels, 250 feet apart, but, ultimately, probably on eight levels, 125 feet apart, and will require several years to complete. As noted in the previous annual report, several scouting diamond-drill holes put down from the 2,975-foot level in 1935 indicated geological and structural conditions in this zone underlying the 2,975-foot level that were considered favourable for ore deposition.

"ORE RESERVES:

"From information obtained in diamond drilling and other openings in various ore-bodies, there is now indicated above the 2,975-foot level, as of January 1st, 1937, the following tonnage of ore:

	AMOUNT (tons)	COPPER (per cent)	GOLD (per ton)
Sulphide ore over 4% copper.....	7,817,000	7.33	0.168
Sulphide ore under 4% copper.....	19,530,000	0.97	0.189
Siliceous fluxing ore.....	3,032,000	0.88	0.133

"ORE SHIPMENTS:

"The tonnage and average grade of ore delivered from the Horne mine to the smelter and concentrator in 1936 were as follows:

	AMOUNT (tons)	COPPER (per cent)	GOLD (oz. per ton)	SILVER (oz. per ton)
Direct smelting sulphide ore.....	483,895	2.82	0.370	0.46
Concentrating sulphide ore.....	1,072,397	1.87	0.137	0.34
Siliceous fluxing ore.....	455,438	0.46	0.128	0.17
TOTAL.....	2,011,730			

"SMELTER:

"During 1936, the smelter treated 1,120,455 tons of ore, concentrate, and refinery slag, and produced 65,376,337 pounds of anodes. After deducting the amount of copper, gold, and silver in the refinery slag that was smelted, the estimated production of new copper, gold, and silver was 62,750,342 pounds of fine copper, 342,495 ounces of gold, and 543,250 ounces of silver.

"CONCENTRATOR:

"The concentrator milled 1,070,597 tons of ore from the Horne mine, the average analysis of which was 1.86 per cent copper, 0.137 oz. gold per ton, and 0.34 oz. silver per ton, from which 179,027 tons of concentrate were produced and sent to the smelter. The cyanide mill treated 149,700 tons of pyrite from the flotation plant tailing, from which 10,016 ounces of gold were recovered.

"NEW CONSTRUCTION:

"At the mine, the flux storage bin was enlarged and a conveyor installed so that the siliceous fluxing ore could be hoisted in the skips instead of in cars; a new steel headframe was erected over No. 5 shaft and a hoist house built to house a new 2,200 horse-power skip hoist, delivery of which is expected the last of March, 1937.

"A new switch-room for the control of the various electrical circuits was added to the concentrator, and a new ball-mill was installed in the secondary grinding section.

"An addition was made to the roaster building to provide room for a ninth roasting furnace, which will be installed in the early part of 1937. In Dec., one of the two reverberatory smelting furnaces was lengthened nine feet and the other one will also be lengthened the same amount the next time it is shut down for repairs. It is expected that these changes will increase somewhat the capacity of the smelter and will improve working conditions and efficiency.

"Dividends paid during the year amounted to \$3.00 per share. The total amount paid by this Company in the form of dividends, since 1930, when the first initial dividend was declared, total approximately \$28,779,948.

"STATISTICS:

"The following table shows the amount of ore hoisted, the tonnage treated in the smelter and concentrator, and the production each year since the commencement of operations:

YEAR	ORE HOISTED (tons)	ORE, CONCENTRATE, AND REFINERY SLAG SMELTED (tons)	ORE TREATED IN CONCENTRATOR (tons)	FINE COPPER PRODUCED (pounds)	GOLD PRODUCED (ounces)	SILVER PRODUCED (ounces)
1927.....	10,740	10,740	.....	552,345	767	2,644
1928.....	265,970	271,926	4,468	33,065,261	52,949	186,277
1929.....	323,316	428,221	51,689	51,223,115	68,732	334,279
1930.....	849,303	734,072	191,856	75,509,373	117,393	691,920
1931.....	1,012,005	765,544	317,792	62,859,355	253,363	558,801
1932.....	1,218,295	918,567	379,637	63,013,485	341,350	619,597
1933.....	1,541,524	1,010,629	676,168	65,008,731	284,675	510,739
1934.....	1,777,021	1,050,684	920,363	70,175,512	248,615	532,809
1935.....	1,906,661	1,076,232	1,048,806	74,478,436	268,333	544,559
1936.....	2,011,730	1,120,455	1,070,597	62,750,342	342,495	543,250

POWELL ROUYN GOLD MINES, LIMITED

This Company was incorporated in 1933 to acquire the assets of Powell-Rouyn Gold Mines, Limited. The new organization resumed mining operations in June, 1936.

A new headframe was erected, and mining equipment was installed at the collar of the inclined shaft. This shaft was sunk by the Nipissing Mining Company in 1923 and 1924. Some lateral work was carried out on the 215-foot level, and the shaft was then continued to the 500-foot horizon. Drifting on the 500-foot level has confirmed diamond-drilling results, and has indicated the presence of a promising ore deposit. The property is now supplied with hydro-electric power, and the sinking of a three-compartment vertical shaft is under way to permit more extensive development.

STADACONA ROUYN MINES, LIMITED

Early in 1936, preparations were made to bring this property into production. Lateral work was continued on all levels, and stopes were prepared above the No. 2 vein drifts.

A cyanide mill, with a rated capacity of 240 tons of ore per day, was completed in November. The ore is hoisted in cars, and is dumped into the shaft-house bin. It is then reduced in size, in a 36 in. by 15 in. jaw

crusher and 7 in. Newhouse crusher. Grinding is accomplished in a 7 in. by 60 in. ball-mill in closed circuit with two classifiers. The classifier overflow is thickened, and enters the first of two agitators in series. The thickener overflow is clarified, and the dissolved gold is then precipitated. Following the primary agitation, the pulp is filtered, washed, re-pulped, and agitated in a third tank. It is then filtered again and washed, the slimes going to tailings. The filtered solutions are returned to mill storage. A high recovery is obtained by this process.

A diabase dyke cuts across the No. 2 vein system at a point about 750 feet to the west of the shaft. An ore-body has been developed on the west side of this dyke, and a substantial tonnage of ore is indicated in this heretofore unexplored area. Drifting and raising are in progress on the new ore-body on the 300- and 600-foot levels.

JOANNÈS TOWNSHIP

ARROWHEAD GOLD MINES, LIMITED

Operations were resumed on the Arrowhead property in the spring of 1936. A diamond-drilling programme totalling 5,300 feet was carried out in twenty-two holes, and several ore intersections were encountered in this work. The sinking of a three-compartment vertical shaft was completed to a depth of 221 feet, and lateral work was in progress on the 200-foot level at the end of the year.

Substantial camps and office buildings were constructed. The shaft is on claim T-802, close to the north boundary. The gold-quartz veins, known as the *A* and *B* veins, are exposed in this vicinity. Encouraging results were obtained in the underground work, and plans were made to deepen the shaft.

O'NEILL THOMPSON GOLD MINES, LIMITED

In early 1936, the shaft was completed to the 160-foot horizon, and a ten-foot sump was excavated below the level. Over 1,000 feet of lateral work was carried out on the 160-foot level, and a raise was holed through to the surface from the 80-foot level.

A 25-ton test mill was erected in the late spring. Power to operate this unit is supplied by a Diesel engine through line shafting. It was operated continuously for about three months, and a small gold production was recorded for this period. Towards the close of the year, operations were suspended.

CLÉRICY TOWNSHIP

BOUCHARD-CLÉRICY GOLD MINES, LIMITED

In the spring of 1936, the 33-foot test pit, which was sunk at the west end of the south vein, was deepened to 100 feet, and about 100 feet of drifting was carried out on this level. On completion of this work, operations were discontinued.

PRIMROSE EXPLORATION COMPANY, LIMITED

In 1936, operations of this Company were confined to the Lusko group, in the south-central part of Cléricy township. Some surface work was carried out on a gold-bearing quartz vein, and an adit was driven in the hillside on lot 20, range V. It is reported that the adit was completed to a distance of 200 feet from the portal, and a 90-foot diamond-drill hole was drilled from the face. Operations were suspended in December, 1936.

DUPARQUET TOWNSHIP

BEATTIE GOLD MINES, LIMITED

The annual report of the Company contains the following record of operations during 1936:

"EXPLORATION:

"Exploration work on the surface during the year consisted of diamond drilling for assessment work. No values or geological information of any importance was obtained from this work.

"The underground exploration work for the year consisted of advancing 12 drift west on the 1st level 600 feet to explore the western extension of the North ore-zone. Diamond drilling from this drift has shown the Main ore-zone to end at about the 4,950 section. Ore widths were greater than expected and, as the work was done early in the year, the tonnage developed was taken into ore reserve figures reported in 1935.

"Two other zones west of the Main zone were disclosed by this drift, containing 250 tons per vertical foot of a grade of 0.16 oz.

"The 22 drift on the 2nd level was extended 1,000 feet to the west to explore at this horizon under the 12 drift. Diamond drilling showed that the main North ore-zone ended at about the 5,080 section, or that the zone pitched to the east at approximately 50 degrees. Farther to the west in this drift, both zones found above in 12 drift were encountered, and at this horizon contain 280 tons per vertical foot of 0.17 oz. grade. The zone farthest to the west is the most interesting of the two, as it had a steep pitch to the west, or away from the main North ore-zone. In addition to the ore that was taken into reserves for 1935, there is approximately 130,000 tons of 0.14 oz. grade developed in this area.

"Exploration work for 1,000 feet east of the main fault in the North ore-zone was carried out this year, consisting of drifts and cross-section diamond drilling on the first, second, fourth, and fifth levels. This work, together with that previously done on the third and sixth levels, shows a block of ore containing 1,500,000 tons above the 5th level, some of which has already been reported in ore reserves.

"The 33 drift on the 3rd level in the North ore-zone was extended 1,100 feet to the Beattie east boundary. It is planned to diamond drill during 1937 from this drift to determine tonnages and grades in this area. The 63 drift on the 6th level in the same ore-zone was also extended 900 feet to the east. The end of this drift is now 1,000 feet west of the Beattie's

east boundary. Ore of medium grades was also encountered in this drift and diamond drilling will be done during 1937 to determine widths and values.

"Diamond drilling in the North ore-zone below the 6th level for exploration purposes consisted of 9 holes. These holes cut the zone at 200 feet below the level, and indicated a mineralized zone forty to fifty feet in width, extending for a length of about 1,000 feet. The average grade of same was about 0.08 oz. gold with occasional higher grades. One hole in particular showed 20 feet of 0.14 oz. One hole on the 7,500 section from the 6th level was extended through to the south porphyry contact, showing a potential grey porphyry mineralized zone at a depth of 800 feet below the 6th level.

"In the A ore-zone, drifting was done on the fourth, fifth, and sixth levels, with horizontal diamond drilling on the 3rd and 5th levels. In this zone, work on the 3rd level indicated 2,600 tons per vertical foot with a grade of 0.12 oz. There are also some additional tonnages indicated by drilling farther to the west.

"Drifting on the 4th level in this zone has shown some interesting sections averaging around 0.25 oz. values, with occasional assays as high as 0.50 oz. Horizontal diamond-drilling will be done during 1937 to determine widths.

"Diamond drilling on the 5th level in this zone indicates the zone breaking up into three lenses which, combined, have a tonnage of 520 tons per vertical foot with a grade of 0.26 oz.

"There has not as yet been enough diamond drilling done on the 6th level in this zone to estimate tonnages and grades.

"On the west end of these two ore-zones from the 22 drift on the second level, a hole was drilled to the south to the sediments without encountering any values.

"DEVELOPMENT:

"During the year, various stoping cross-cuts, manway and box-hole raises, and ore passes were driven to prepare the block of ore in the North ore-body east of the Main fault for mining. At the end of the year, this development work is well along and mining in this section will be started early in 1937.

"In connection with the above development work, a crusher station was cut out on the 6th level, and the work of installing a 36 in. by 48 in. crusher and a 600-foot long 36-in. conveyor is about finished. All underground crushing will now be done on the 6th level. The crusher just installed was taken from the 3rd level and will be used for crushing ore from the stopes east of the main fault. The other crushing arrangement on this level is used for ore coming from stopes west of the fault.

"These two crushing installations eliminate practically all underground haulage except from exploration drifts and ore mined other than from the Main ore-zone.

"ORE RESERVES:

"During the year, 551,030 tons of ore were mined at an average grade of 0.1495 oz. gold. Practically all of the ore mined this year came from the North ore-zone west of the main fault.

"Further exploration in the North ore-zone east of the main fault, consisting of diamond drilling and preparations for mining this block of ore, has made it possible to add 650,000 tons of ore to the reserves this year.

	AMOUNT (tons)	Gold (oz. per ton)
NORTH ZONE:		
Reserve January 1st, 1936.....	4,128,670	0.144
Partially developed east of Main fault.....	650,000	0.138
TOTAL.....	4,778,670	0.143
Milled 1936.....	551,030	0.1495
RESERVE.....	4,227,640	0.142
A ZONE:		
Indicated by diamond drilling.....	300,000	0.152
TOTAL RESERVE, Jan. 1st, 1937.....	4,527,640	0.143

"MILLING:

"There were 551,030 tons of ore milled during the year 1936, assaying 0.1495 oz. gold per ton.

"The average daily tonnage rate of ore milled for the year was 1,550 tons per day. The flow-sheet for the plant was practically the same as used in 1935. Concentrates resulting from the re-flotation of cyanide residues were shipped to the American Smelting & Refining Company's smelter, Tacoma, Wash., as was done in 1935.

"Some few small additions and betterments were made in the mill this year that have helped to improve recoveries slightly.

"Experimental work on Beattie ores was continued in an effort to work out a more profitable metallurgical method than the one in use. Investigations were made into the possibilities of erecting a smelter here, but after looking into the cost of same and uncertainty of available copper necessary for gold collection, it was decided not to do so.

"From experimental work, it has been determined that considerable improvement over present metallurgical practice can be had by roasting primary concentrate before cyanidation, and it has been decided to erect a roasting plant at the property if permission to do so is granted by the Provincial Government and it is planned to erect a plant during 1937.

"TRANSPORTATION:

"Work was continued during the year in ballasting and improving the road-bed of the railway. A regular daily train service is now maintained between Davangus, a town on the C.N.R., and Beattie Mines. It will be necessary during 1937 to do further ballasting, and mine waste-rock is used for this purpose.

“CONSTRUCTION AND PLANT IMPROVEMENT:

“During the year, preparations underground were made for the 6th level crushing equipment installation to facilitate mining the block of ore east of the fault in North ore-zone, and the completion of the installation of the new Bellis-Morcom compressor. The latter work was started in 1935.

“On the surface, alterations to the power substation and re-locating service lines were continued to facilitate changes made during 1935.

“The domestic water used at the plant is taken from Duparquet lake. This water is very dirty and shows considerable human contamination. To correct this situation and prevent the possibility of an epidemic of serious nature, a water filtering plant was installed. Also, during the year, electrical power service lines and street lighting equipment were installed in the Town of Duparquet”.

The net profit for the year, after providing for taxes and depreciation, amounted to \$510,079.54. It is intimated that the Company may pay an initial dividend of five cents a share in 1937.

DESTOR TOWNSHIP

DESCAR MINING CORPORATION, LIMITED

This Company holds the mining rights to a group of twenty claims situated in ranges II and III of Destor township.

During 1936, an extensive programme of surface work was carried out. It is reported that the work was, for the most part, confined to a wide mineralized zone in Keewatin volcanic rocks. Late in the year, 4,527 feet of diamond drilling was completed.

LA REINE TOWNSHIP

LA REINE GOLD MINES, LIMITED

Surface work was carried out on the property and toward the end of the year diamond drilling was commenced. The work has been confined for the most part to lots 51 and 52, range IV.

It is reported that three quartz veins, containing molybdenite, were explored.

DESMELOIZES TOWNSHIP

NORMETAL MINING CORPORATION, LIMITED

The annual report of the Company for the year ended December 31st, 1936, contains the following reference to recent activities and plans for 1937:

“The difficulties which had delayed financing and the resumption of operations at the Company’s mine were overcome late in December and steps were immediately taken to reopen the mine and re-design and complete the mill. Orders for the necessary machinery and equipment have been placed and it is expected the mine will go into production on a 200 to 250 tons per day basis during the summer, with provision made to increase to 500 tons later in the year.

"The mine, which has been kept de-watered, will be made ready for production by the time the mill is completed. The main shaft has been sunk to a depth of 900 feet and development has been carried on to the 800-foot level. There is sufficient positive ore of profitable grade, at present prices for copper and zinc, developed to supply a mill of 500 tons daily capacity for over three years. There are other known ore-bodies of large dimensions which have not been sufficiently developed to estimate tonnage. Diamond drilling, to a depth of 1,200 feet, indicates the continuation of the principal ore-body to at least that horizon".

LAUNAY TOWNSHIP

FREEGOLD MINES, LIMITED

This Company was incorporated in 1936 with a capitalization of 3,000,000 shares of \$1.00 par value stock.

The property is situated in the south of Launay township and comprises the following lots: lots 6 to 11 and the south half of lot 12, range II; lot 7, range I.

Several gold-bearing quartz lenses have been explored by trenching and test-pits. In 1936, 2,752 feet of diamond drilling was completed. Plans have been prepared to install a mining plant and to undertake an underground development campaign.

BOUSQUET TOWNSHIP

BOUSCADILLAC GOLD MINES, LIMITED

This Company has acquired the property of Graham-Bousquet Gold Mines, Limited. In 1936, a new hoist-house, dry-house, and headframe were constructed, and connections were made with the hydro-electric power supply. A new 36-inch by 24-inch double-drum electric hoist, and a 600 cubic foot electric air-compressor, were installed.

The mine was de-watered to the 500-foot level and a complete re-sampling of the underground workings was carried out. Lateral work was in progress on all levels at the end of the year.

CALDER-BOUSQUET GOLD MINES, LIMITED

This Company was incorporated in 1936 with a capitalization of 3,000,000 shares of \$1.00 par value stock. It holds the mining rights to the following claims: A-37292 to 37301, and 54650 to 54659.

In 1936, a shaft was sunk to a depth of 125 feet and a limited amount of lateral work was carried out at the 70- and 125-foot horizons. Light portable mining equipment was used in this work. The object of this work was to explore a wide mineralized zone which contains stringers and lenses of quartz. It is reported that encouraging gold values were obtained in sampling the zone, but apparently this was not confirmed in the preliminary underground work and operations have been suspended.

MOOSHLA GOLD MINES, LIMITED

In 1936, substantial camps and mine buildings were constructed. The small shaft, sunk in the previous year on the A zone, was enlarged to three-compartment size. It was then continued to a depth of 372 feet, and lateral work was commenced on the 230- and 345-foot levels.

The Company reports that drifting on the 115-foot level has exposed an ore-shoot averaging approximately one ounce gold per ton over a width of 34.4 inches for a length of 72 feet. On the 230-foot level, a 56-foot length of ore averaged over 0.9 ounces gold per ton across a width of 31.5 inches. On the bottom level, preliminary sampling has indicated 75 feet of ore averaging over 2.5 ounces gold per ton. Bulk sampling has confirmed these values.

The mining equipment installed on this property includes two 60 h.p. steam boilers, a 10-inch by 12-inch steam hoist, and a 500 cubic foot steam-driven compressor. A small d.c. steam-electric generator supplies power for lighting purposes.

NORGOLD MINES, LIMITED

In 1936, some diamond drilling was carried out on the south group of claims of this Company, and the sinking of a small shaft was in progress toward the end of the year. Operations have since been discontinued.

CADILLAC TOWNSHIP

AMM GOLD MINES, LIMITED

This Company was incorporated in 1936 with a capitalization of 3,000,000 shares of \$1.00 par value stock. The property is situated in the centre of the township and comprises the following claims: A-584, 585, and 58821 to 58825.

During the summer and fall, surface work was carried out to explore some gold-bearing quartz veins, and in December a diamond drilling programme was commenced. It is reported that the Company plans to undertake an underground exploration campaign during the coming summer months.

CENTRAL CADILLAC GOLD MINES, LIMITED

This Company was incorporated in July, 1936, with a capitalization of 3,000,000 shares of \$1.00 par value stock. It holds the mining rights to a group of claims situated in the central part of Cadillac township. In the fall of 1936, an electric power line was completed to the property, and the sinking of a two-compartment vertical shaft was commenced. Early in 1937, this shaft was completed to a depth of 223 feet, and lateral work was commenced on the 100- and 200-foot levels.

Diamond drilling was also carried out, and some promising intersections of gold-quartz ore were obtained in this work.

KEWAGAMA GOLD MINES, LIMITED

This Company was incorporated in 1936, with a capitalization of 5,000,000 shares of \$1.00 par value stock, to acquire the assets of Canadian Gold Operators, Limited.

New camps and mine buildings were erected. An electric power line was completed, and electric mining equipment was installed in the hoist-house. At the end of the year, de-watering of the mine workings had been completed, and deepening of the shaft from the 125-ft. level to a depth of 500 feet was in progress.

LAPA CADILLAC GOLD MINES, LIMITED

Attempts were made during 1935 to sink a shaft on this property but they were unsuccessful, due to the presence of quicksand in the deep overburden. In 1936, these difficulties were overcome by utilizing steel sheet-piling, and bedrock was reached at a depth of thirty-five feet. A three-compartment shaft was sunk to a depth of 175 feet, and approximately 700 feet of lateral work was completed on the 165-foot level. This work confirmed previous diamond drilling results. Two silicified zones, containing gold values, were intersected, and some spectacular free gold was found at one point. The results were deemed sufficiently encouraging to warrant more extensive development. A substantial headframe was erected, and the light mining equipment was replaced by heavier machinery. Deepening of the shaft was in progress at the end of the year.

MARITIME CADILLAC GOLD MINES, LIMITED

In November, 1936, a diamond-drilling programme was commenced on this property. By February, 1937, ten holes having a total length of about 4,000 feet had been completed.

MINES OPERATING CORPORATION, LIMITED

This Company is engaged in mining operations on the Pan-Canadian Gold Mines group.

In the summer of 1936, a promising discovery was made on claim A-52842. It consists of a narrow, high-grade gold-quartz vein containing free gold and telluride minerals. Plans have been made to sink a shaft to explore this discovery, and by February, 1937, an electric power line had been completed to the property.

O'BRIEN GOLD MINES, LIMITED

In 1936, the mill continued to treat from 75 to 80 tons of ore per day. In the early part of the year, drifting was commenced on the 750- and 1,000-foot levels on the No. 4 vein, to the west of the main shaft. Spectacular high-grade ore was encountered. The vein was subsequently opened by drifting on the 500-, 625-, and 875-foot levels. This ore-shoot has an average length of 220 feet, of which thirty-five feet is very high-grade material.

East of the shaft, drifting on the No. 4 vein on the four new levels disclosed medium grade ore over an average length of 430 feet.

As a result of the promising developments, plans were made to expand operations. The main shaft was deepened to the 1,500-foot horizon, and new levels were established at depths of 1,125, 1,250, 1,375, and 1,500 feet. The capacity of the mill and roasting plant was doubled. A steel headframe was erected over the main shaft, and the sinking of another shaft was commenced near the west boundary of the property. A campaign of diamond drilling was also carried out, with holes at intervals from the east to the west boundary of the property.

The annual report of the Company for the period October 6th, 1935, to October 3rd, 1936, gives the following data on production and mill operation:

TONS TREATED.....	27,003 tons
TOTAL GOLD CONTENT OF ORE TREATED.....	14,898,929 oz. = \$ 523,008.68
AVERAGE GRADE PER TON TREATED.....	0.552 oz. = \$ 19.37

	Ounces	Value
RECOVERY:		
Values in ore from mine.....	14,898.929	\$ 523,008.68
Values in concentrates from stockpile.....	1,034.729 oz.	
Less values in concentrates placed on stockpile.....	311.586 oz.	
	723.143	25,356.58
	15,622.072	\$ 548,665.26
BULLION PRODUCED.....	14,412.117	\$ 505,692.61
SPECIMENS SOLD.....	46.589	9,957.86
VALUES IN PROCESS.....	416.934	14,592.69
VALUES RECOVERED.....	14,875.640	\$ 522,243.16
TAILING LOSS:		
Flotation tails.....	485.926 oz.	
Roasting and cyanidation loss....	260.506 oz.	
	746.432	\$ 26,122.10
	15,622.072	\$ 548,365.26

RECOVERY—95.2 per cent

The following summary of ore reserves above the ninth level is "based upon the values recovered from tonnage actually milled from development drifts and stopes to date, and is conservative":

SUMMARY OF ORE RESERVES TO 1,037-FOOT HORIZON ONLY

	TONS	OUNCES GOLD PER TON
Probable ore in place.....	113,486	0.746
Broken ore.....	5,626	0.700
Development dump.....	14,313	0.115

In the period from October 4th to December 26th, 1936, gold production amounted to approximately 7,000 ounces.

PANDORA CADILLAC GOLD MINES, LIMITED

This Company is a reorganization of Canadian Pandora Gold Mines, Limited. It was incorporated in 1936 with a capitalization of 3,000,000 shares of \$1.00 par value stock.

In June, 1936, the mine was de-watered. Throughout the remainder of the year, lateral work was in progress on the 250-, 375-, and 500-foot levels. In the fall, a diamond drilling programme was commenced, and by the middle of February, 1937, twenty-six holes totalling over 9,000 feet had been drilled.

The lateral work is reported to have proved the existence of some short ore-shoots, and visible gold was encountered in several places.

RUBEC MINES, LIMITED

This Company holds the mining rights to blocks 1 to 10, situated in the eastern part of Cadillac township.

Camps were erected, and some surface work was carried out. A diamond drilling programme totalling 7,080 feet was also completed. The activities of the Company are under government investigation as a result of alleged salting of diamond-drill cores.

THOMPSON CADILLAC MINING CORPORATION

In the spring of 1936, the mill was brought into production on a basis of 75 tons per day. The original flow-sheet was radically changed. The cyanide unit was discarded and has been replaced by a combination of amalgamation and flotation.

The ball-mill operates in closed circuit with three cone classifiers and a duplex classifier. Coarse gold is trapped in the cones. The slimes are pumped to six Denver sub-A flotation cells. The spigot products pass over blanket tables to waste. The flotation concentrates are separated on a shaking table, and the table concentrates, together with the cone concentrates, are amalgamated in a barrel. The table middlings and tails pass through a Gibson amalgamator and a series of amalgamating plates to a thickener. The product from the thickener, and the rejects from the amalgamating barrel, are stock-piled for shipment to a customs smelter.

Lateral work was continued on the 150-, 300-, and 600-foot levels. The west drift on the 150-foot level was advanced to a distance of over 1,000 feet from the shaft, where some very spectacular gold ore was encountered. Stopes were developed above the three levels, and at the end of the year a steady production was being maintained.

WOOD CADILLAC MINES, LIMITED

Diamond drilling and surface work carried out on the Wood Cadillac property some years ago indicated the presence of gold-bearing quartz veins. Drilling was resumed in 1936 and, at the end of the year, 4,769 feet had been completed in eight holes. It is reported that this drilling was attended with encouraging results, and plans were made to undertake an underground exploration campaign.

MALARTIC TOWNSHIP

DEMPSEY-CADILLAC GOLD MINES, LIMITED

This Company was incorporated in 1936 with a capitalization of 3,000,000 shares of \$1.00 par value stock. The property is astride the Cadillac-Malartic boundary and comprises ten claims in Cadillac township and six lots in Malartic.

In February, 1937, over 4,500 feet of diamond drilling had been completed in twelve holes. A vertical, two-compartment shaft had been sunk to a depth of 125 feet, and station-cutting was in progress at that depth. The mining plant included a 7-inch by 10-inch steam hoist, a 30 h.p. boiler, and a 360 cubic foot Diesel-driven compressor. Substantial camps were built. It is planned to continue the shaft to the 250-foot horizon before lateral work is commenced.

The shaft was sunk on a gold-bearing quartz vein. To a depth of 80 feet, the vein averages about two feet in width.

DEANE-CADILLAC MINING CORPORATION

This Company was incorporated in 1936 with a capitalization of 3,000,000 shares of \$1.00 par value stock. The property is situated astride the Cadillac-Malartic boundary, and includes claims A-58846 to 58850 and 58967 to 58971 in Cadillac township, and the north half of lot 1, range V, in Malartic township.

In 1936, some surface work was carried out, and 3,656 feet of diamond drilling was completed. It is reported that gold values were encountered in this work.

FOURNIÈRE TOWNSHIP

CANADIAN MALARTIC GOLD MINES, LIMITED

The annual report of the Company for the year 1936 contains the following information covering operations at the property:

"During the period January 1st to August 1st, the tonnage treated progressively increased to an average of 349 tons daily. In July it was decided that mine development would be sufficiently advanced in January, 1937, to permit a further increase in output and the necessary plant was ordered.

"The new crushing section was placed in service in November, resulting in an increase in tonnage treated, in December, to 426 tons daily. The new addition to the mill building was completed by the end of the year and plant installation was proceeding with a view to full operation on February 1st, 1937.

"A larger hoist was installed to service the No. 2 shaft and this shaft was enlarged and completed to below the 7th level.

"The expansion programme was completed with only two days' interruption to operation and no further financing was found necessary.

“PRODUCTION:

“Details of production are shown in the following statement of operations.

“Milling results were as follows:

Dry ore milled.....	121,922 tons
Days operated.....	346 days
Average per day.....	334 tons
Fine gold produced.....	19,939.213 oz.
Fine silver produced.....	10,437.81 oz.
Average grade ore milled, gold.....	0.1813 oz./ton
Average grade tailing, gold.....	0.0178 oz./ton
Recovery, gold.....	90.18 per cent

“DEVELOPMENT:

“Cross-cuts were run from No. 1 shaft to the No. 2 shaft locations on the 4th (500-foot), 5th (625-foot), and 6th (750-foot) levels. No. 2 shaft was completed by raising from these levels, by sinking below the 6th level, and by enlarging to three compartments above the 450-foot horizon. It is inclined at 60 deg. and has a slope depth of 1,057 feet. A station was started at the 7th level at a vertical depth of 886 feet. A loading station below the 6th level was installed to deliver the ore from the North ore-body.

“The North ore-body was developed by drifts on the 4th and 5th levels and by raises above these levels. An ore pass was driven from above the loading station to the 5th level.

“The South ore-body was further developed by raises and sub-levels above the 3rd level.

“On the 6th level, 110 feet south of No. 1 shaft, a new vein was discovered. Drifting showed an ore length of 80 feet, width 10 feet, averaging 0.6 oz. per ton. Both ends are below pay grade but further development is planned.

“No exploration was attempted to determine the downward extension of the ore-zones along the porphyry contact, but further diamond drilling is planned when the lower levels reach convenient positions.

“DIAMOND DRILLING:

“Underground, 25 holes were drilled, aggregating 6,058 feet. Some further ore was indicated east of the ore-reserve blocks. Data is not yet sufficient to permit estimates as to tonnage or grade.

“In May, a surface drilling programme was started along the strike of the North ore-body east of the mine workings. Twenty-one holes were drilled, aggregating 8,700 feet.

“The ore-zone follows the south flank of a porphyry spur which extends westerly from a mass outcropping near the east boundary. It is somewhat segmented by faulting and is below pay grade in parts, but a large tonnage is indicated for further development.

“Limited drilling is not reliable with respect to grade, as the ore-zones show considerable variation at different horizons, and no addition to ore reserves has been made as a result of this work.

“ORE RESERVES:

“Development and diamond-drilling results again permit a satisfactory increase in ore-reserve tonnage. Reserves have been recalculated on a lower-grade basis to conform more closely to stoping practice, which necessitates breaking the full economic width in one operation.

“Ore reserves as of December 31st are as follows:

	Tons	AVERAGE GRADE PER TON	VALUE GOLD AT \$35
Assured ore reserves.....	479,500	0.189 oz.	\$ 6.61
Indicated ore.....	469,000	0.147 oz.	5.15
TOTAL.....	948,500	0.168 oz.	\$ 5.88

“The crusher house was lengthened and a 4-foot Symons cone crusher equipped with a fine bowl, working in closed circuit with vibrating screens, was installed. The crushing plant is now capable of crushing 45 tons per hour through a $\frac{3}{8}$ in. by $4\frac{1}{2}$ in. screen.

“The mill building was extended to provide space for a third 7 ft. by 6 ft. ball-mill with the necessary treatment units. It will be possible to add a fourth ball-mill without further enlargement of the building should mine conditions warrant it. The capacity of the present mill is about 650 tons daily.

“The No. 2 hoist and power house was enlarged to permit the installation of a 72 in. by 54 in. *PE-I* electric mine-hoist capable of hoisting 60 tons per hour from 2,000 feet, and a $19\frac{1}{2}$ in. by 12 in. by 10 in. *XV.H.E.-2* compressor with an actual delivery of 1,060 cubic feet per minute”.

The net operating profit, before providing for depreciation and deferred development, amounted to \$198,242.57.

EAST-MALARTIC MINES, LIMITED

Diamond drilling and underground work were continued on this property. At the end of the year, the drilling totalled 808 feet. Two vertical shafts were sunk, and over 3,500 feet of drifting and cross-cutting was completed.

No. 1 shaft is on claim A-51318. It is of three-compartment size and was sunk to a depth of 350 feet. Lateral work at the 175- and 325-foot horizons is reported to have confirmed the presence of a gold-bearing zone.

No. 2 shaft is 3,000 feet east of No. 1. In sinking it, a temporary air hoist was used, the compressed air being conveyed from the No. 1 shaft power-house. It has the same size and depth as No. 1 and levels have been established at the same intervals, *viz.*, 175 and 325 feet. It is reported that several short ore-shoots were developed in the No. 2 shaft workings.

SLADEN-MALARTIC MINES, LIMITED

In 1936, substantial camps and mine buildings were erected on this property. An electric power-line was completed, and electric mining-equipment was installed.

A vertical, three-compartment shaft was sunk on claim A-2110 to a depth of 237 feet. A station was cut at the 200-foot horizon, and a cross-cut, driven to the north, intersected the ore-zone at a distance of 150 feet from the shaft. A drift was opened to the west along the zone to within fifteen feet of the property boundary, and at intervals short cross-cuts were driven to north and south. This work has indicated a lens of ore 275 feet in length, and up to 50 feet in width, of good commercial grade.

Toward the end of the year, deepening of the shaft was in progress.

VARSAN TOWNSHIP

DORVAL-SISCOE GOLD MINES, LIMITED

This property lies to the north and west of the Siscoe mine, and is, for the most part, covered by water. In past years diamond drilling was carried out from the ice, and it is reported to have indicated the continuation of the Siscoe *K* zone into the property. Drilling was resumed in 1936, and by February, 1937, seventeen holes aggregating over 10,000 feet had been put down.

Toward the close of the year, the sinking of a vertical, three-compartment shaft was commenced on an island on claim A-33388. The mining equipment includes a 10 in. by 12 in. steam hoist, a Diesel-driven compressor, and an 80 h.p. locomotive-type boiler.

SISCOE EXTENSION GOLD, LIMITED

This Company was incorporated in 1936 with a capitalization of 3,000,000 shares of \$1.00 par value stock, to acquire the assets of Siscoe Extension Gold Mines, Limited.

Throughout 1936, operations were continued on the Siscoe Extension property. Lateral work was resumed on the 350-foot level, and it is reported that several narrow ore-shoots were developed. Diamond drilling was in progress throughout most of the year, and a total footage of 8,986 feet was completed.

DUBUISSON TOWNSHIP

GALE GOLD MINES, LIMITED

During 1936, the shaft was deepened to 275 feet, and lateral work was carried out on the 125- and 250-foot levels. Diamond drilling was in progress at the end of the year. Some narrow quartz veins were encountered in the underground workings, and in several places they contained free gold. Up to the end of the year, the work had not indicated any continuous ore zone.

Plans were made to electrify the equipment, and early in 1937 a power line was built to the property.

GREENE STABELL MINES, LIMITED

Early in 1936, the old mine workings became depleted of ore, and the mill was shut down. Underground operations continued on the Hammell group, at Stabell lake.

Lateral work was carried out here on the 400- and 500-foot levels of the Stabell Lake shaft. The annual report of the Company contains the following reference to developments:

"An ore-shoot approximately 110 feet long was developed on the 400-foot level. Subsequent mining on this ore-shoot disclosed that it was limited in vertical extent. On the 500-foot level, another shoot was developed of good grade ore, and it was found that this behaved in a similar manner to the one on the 400-foot level when mining operations were commenced above the 500 level. A winze was sunk on this shoot from the 500-foot level and has given consistently good assays to its present depth of approximately 600 feet. Two sub-levels were opened up and both have shown more continuity than on the 400- or 500-foot levels. At the present time, the vein is six feet wide, of high-grade ore, in the bottom of the winze".

The mill flow-sheet was altered to a straight cyanidation process, and at the end of the year the mill was treating about twenty-five tons of ore per day. This ore was obtained from development headings in the Stabell Lake workings.

HARRICANA AMALGAMATED MINES, INCORPORATED

During the first part of 1936, this property was under option to the Mining Corporation of Canada. Operations were largely confined to diamond drilling, and a total of 10,965 feet was completed. The option was relinquished, and diamond drilling was continued by the owners.

It is reported that an underground exploration campaign will be carried out during the summer of 1937.

KIENA GOLD MINES, LIMITED

This Company was incorporated in 1936 with a capitalization of 3,000,000 shares of no par value stock. It holds the mining rights to a large acreage, including the Parker Island Gold Mines property.

Mining operations were confined to Parker island. During the summer months, four diamond-drill holes totalling 2,500 feet were put down. Later in the year, substantial camp and mine buildings were constructed, and a three-compartment vertical shaft was sunk to a depth of 455 feet. Levels were established at 125, 230, 330, and 430 feet, and lateral work was commenced on the 1st and 4th levels.

It is reported that ore indications were encountered in the diamond drilling campaign.

The mining plant includes two 600 cubic foot Diesel-driven compressors and an 8 in. by 6 in. double-drum hoist. The hoist is driven by compressed air.

SHAWKEY GOLD MINING COMPANY, LIMITED

This property was brought into production in February, 1936. The mill was originally designed with a capacity of 125 tons of ore per day, and this was gradually increased until at the end of the year an average daily mine output of 160 tons was being treated.

Stopes were developed above the 125-, 225-, 325-, 450-, and 575-foot levels. Exploratory drifting and diamond drilling was carried on throughout the year.

In 1936, the mill treated 40,614.87 tons of ore, and 7,325 ounces of gold were produced.

SISCOE GOLD MINES, LIMITED

The annual report of the Company for 1936 contains the following account of operations during the year:

“PRODUCTION:

“The sum of \$2,428,470.17 was produced from the milling of 181,177 tons of ore. Average mill-heads were lower, in accordance with our policy to treat all ores on which a profit can be calculated, thus conserving the ore resources and lengthening the life of the mine. The following comparative table illustrates the unfolding of the Siscoe enterprise:

YEAR	PRODUCTION	TONS MILLED	HEADS	TAILINGS	COST PER TON MILLED	PER CENT EXTRACTION
*1929....	\$307,403.75	29,836	\$10.53	\$0.232	\$7.62	98.7
*1930....	367,266.20	33,744	11.11	0.230	7.23	97.7
*1931....	742,811.76	55,675	13.63	0.285	6.63	97.91
*1932....	1,006,113.30	63,998	15.94	0.219	6.117	98.63
*1933....	1,132,904.19	96,348	12.10	0.345	5.346	97.14
1934....	2,116,603.49	124,151	17.60	0.551	4.949	96.86
1935....	2,274,582.58	149,070	15.81	0.556	5.014	96.48
1936....	2,428,470.17	181,177	13.81	0.401	4.782	97.09

* Value based on gold at \$20.67 per ounce.

“NEW ORE:

“The enlarged development programme on which we embarked during 1935 was continued in 1936. A total of 22,886.1 linear feet of work was done. The main shaft was sunk 498.1 feet to a depth of 1,900 feet; 3,559.1 feet of cross-cuts, 14,585.1 feet of drifts, and 3,243.5 feet of raises were driven. Of this, 9,694.1 feet was development in ore, which is approximately 42.7 per cent of the total. The programme as carried out consisted of:

- “(1) Developing the horsetail section of the Main vein on the 7th, 8th, 9th, and 10th levels.
- “(2) Further developing the Siscoe vein on the lower levels, particularly the 6th, where some excellent ore was opened up.
- “(3) Exploring for and developing numerous lenses on various levels of the *K* zone.
- “(4) The discovery of, and development of, the *F* vein on the 5th, 4th, and 3rd levels.
- “(5) The exploration of the *A* vein area out in the greenstones to the south, where some ore was opened up.
- “(6) The opening up and development of the Stee vein along the granodiorite contact under the northwest part of the island.
- “(7) The sinking of the main shaft to 1,900 feet, providing four new levels at 1,475, 1,600, 1,725, and 1,850-foot depths.
- “(8) Cutting stations on the above-mentioned levels and starting exploration from them to pick up, first, the *K* zone, and, later, other veins which may be found.

"This campaign of exploration and development added 250,912 tons to the ore reserves. At the end of the year there were 451,827 tons having a calculated grade of \$13.28 per ton. Of this, 76,636 tons were in the form of broken ore in stopes.

"We now have before us the development of the ore-bodies on the four new levels, the exploration of outlying areas within our own boundaries and, finally, the exploration of the claims in the West Siscoe and House option. The latter has been started and is being done by diamond drilling from the surface. Should conditions warrant, this will be followed by underground work.

"MILLING OPERATIONS:

"In the mill, a number of changes and improvements were made which permitted us to gradually increase the average daily tonnage milled from 404.6 tons in December, 1935, to 564.0 tons in December, 1936. There were individual days when more than 600 tons were treated. Principal units of new machinery installed were: a 30 ft. by 12 ft. tray thickener, a 24 ft. by 24 ft. Dorr agitator, and a 3 ft. by 5 ft. amalgam barrel. The cyanide process, which is the final one in our flow-sheet, continued to assume greater importance".

As illustrating the last paragraph, the report gives the following data:

	PERCENTAGES		
	1936	1935	1934
Recovery by cyanidation.....	21.263	11.17	4.83
Recovery by amalgamation.....	75.829	85.32	92.03
	97.092	96.49	96.86
Tailing losses.....	2.908	3.51	3.14
	100.00	100.00	100.00

Dividends totalling twenty-one cents per share were paid during the year, bringing the total sum disbursed to shareholders since the commencement of operations to \$3,963,468.26.

SULLIVAN CONSOLIDATED MINES, LIMITED

During the year 1936, the No. 2 inclined shaft was completed to the 550-foot horizon, and lateral work was commenced on the 450- and 550-foot levels. A new crushing plant and conveying equipment were installed, and all ore is now hoisted in skips through the No. 2 shaft.

The annual report of the Company contains the following references to mining and milling:

"MINING:

"Beyond stope preparation during the early part of the year, no ore was taken from the A vein above the 150-foot level. In all, 46,986 tons of ore were delivered to the mill-bins, of which 21,964 tons were taken from stoping operations and stope preparation, 24,593 tons were obtained from development, and 429 tons were taken from the surface dump.

"It can be stated in conservative terms that, at current production, there is at least a two-year reserve of ore now blocked out. Additions to this reserve will depend upon future development.

"MILLING:

"A year ago, plans were made to increase mill tonnage to a daily average of 150 tons per day. This was accomplished by providing a new and larger crushing plant and conveying equipment together with the necessary mine and mill bins. All construction was completed in September and production has since been maintained at the desired tonnage.

"The mill treated 46,032 tons, producing \$627,293.09 in gold and \$2,043.62 in silver. This production was accomplished with a consumption of 0.44 lb. of cyanide per ton and 2.1 lb. of grinding steel per ton. Recovery remained constant at 97 per cent throughout the year".

WISIK GOLD MINES, LIMITED

This Company was incorporated in 1936 with a capitalization of 3,000,000 shares of no par value stock. The properties lie to the south of the Kiena Gold Mines group, and cover a large acreage.

It is reported that diamond drilling by former holders encountered a promising gold-bearing vein. In 1936, a three-compartment shaft was sunk on Moccasins island to a depth of 325 feet. Levels were established at the 200- and 300-foot horizons. The vein was encountered in this work, and drifting was under way at the end of the year.

The mining plant is operated by compressed air, piped from the Kiena Gold Mines power-house, 4,000 feet distant. The plant includes an 8 in. by 6 in. double-drum hoist.

BOURLAMAQUE TOWNSHIP

BIDLAMAQUE GOLD MINES, LIMITED

During 1936, this property was under option to the Mining Corporation of Canada. At the end of the year, a total of 8,951 feet of diamond drilling had been completed. The optioners reported that interesting results had been obtained in this work.

LAMAQUE CONTACT GOLD MINES, LIMITED

In the late summer of 1936, a diamond-drilling programme was commenced on this property and, up to the end of the year, the total footage drilled amounted to about 5,000 feet.

LAMAQUE GOLD MINES, LIMITED

A review of developments is contained in the annual report of the Company for 1936, from which the following paragraphs are reproduced:

"During this period, 201,356 tons of ore were treated. The recovery of bullion was the equivalent of 76,697.45 troy ounces of fine gold, which realized \$2,686,071.08, or \$13.34 per ton of ore milled. The mill recovery was 98.3 per cent of the gold content of the tonnage treated.

"Mine development was pushed throughout the year, with satisfactory results. Not only were 201,356 tons of ore sent to the mill, but the positive ore reserves were increased 155,987 tons; while on the lowest levels, namely, the 950-, the 1075-, and the 1200-foot levels, 4,521 feet of ore were exposed in drifting.

"Diamond drill exploration amounted to:

Surface.....	2,550.5 feet
Underground.....	29,950.0 "
TOTAL.....	32,500.5 feet

"The technical estimate of 'positive ore' reserves at January 1st, 1937, was as follows:

	TONS	PENNYWEIGHTS PER TON	TOTAL GOLD IN PENNYWEIGHTS
Broken ore.....	81,391	6.27	510,562
Blocked ore.....	390,787	6.97	2,722,877
TOTALS AND AVERAGE.....	472,178	6.85	3,233,439

"The sinking of No. 7 shaft for deep mining was commenced and reached a depth of 385 feet. This shaft is vertical, with four compartments. It is planned for an ultimate depth of 3,600 feet and is scheduled to reach 2,000 feet before the end of 1937. In conjunction with No. 7 shaft, the installation of the hoist (to handle combined five-ton skips and cages at rope speeds up to 1,500 feet per minute) and the erection of a 150-foot-high steel headframe with bins and shaft-house, were completed".

The net operating profit for the year 1936 amounted to \$842,517.95.

MYLAMAQUE GOLD MINES, LIMITED

This Company was incorporated in 1936 with a capitalization of 3,000,000 shares of \$1.00 par value stock. The claims are situated to the south of the Lamaque mine. In 1936, a diamond-drilling programme was carried out, and, to the end of the year, the total footage drilled amounted to 6,502 feet.

NUMAQUE MINING COMPANY, LIMITED

This Company was incorporated in 1936 with a capitalization of 3,000,000 shares of \$1.00 par value stock.

In the first annual report to the shareholders, dated March 17th, 1937, it is stated that from July, 1936, three diamond drills were in constant operation. Sixty-three holes totalling 23,362 feet were completed.

It is reported that masses of porphyry, and dykes, were intersected in many of the holes, together with some shear-zones and a few quartz veins.

PAYORE GOLD MINES, LIMITED

In the spring of 1936, substantial camps were erected at this property. A headframe was constructed, and a mining plant installed. The sinking of a three-compartment vertical shaft was commenced, but operations were then suspended until the end of the year.

The mining equipment includes a steam hoist, a locomotive-type boiler, and a 500 cubic foot Diesel-driven compressor. Plans to utilize hydro-electric power were under way at the end of the year.

QUEBEC MANITOU MINES, LIMITED

This Company was incorporated in the fall of 1936 with a capitalization of 3,000,000 shares of \$1.00 par value stock, to acquire the properties of the Golden Manitou Syndicate.

Surface work was carried out, and, toward the end of the year, a diamond-drilling programme was commenced.

In early 1937, the diamond drilling indicated the presence of substantial deposits of zinc ore, with a few high silver and gold assays, and plans were made to carry out an underground development campaign.

SIGMA MINES, LIMITED

The annual report of the Company for 1936 contains the following account of operations during the year:

"No. 2 shaft was deepened 523.0 feet to a total depth of 1,086.0 feet from the collar. Four additional levels were established at the 5th level (600 ft.), 6th level (725 ft.), 7th level (850 ft.), and 8th level (975 ft.) horizons. At the 8th level, provisions were made for future sinking operations. A loading pocket was cut 75 feet below this level.

"Further development work was done on the *A*, *B*, *C*, and *D* zones, which provided additional ore. There has been added during the period to the existing productive zones *A*, *B*, *C*, and *D*, three additional zones, referred to as *E*, *F*, and *G* zones. Of these, *E* is to date the most important.

"*E* zone roughly parallels and underlies the *D* zone and dips 45 degrees to the north. Like the *D* zone, it appears to be a cross-fracture between *C* and *G*. It is developed on the fourth level only, and lies 120 feet north of the *C*, which, in contrast to *E*, dips steeply to the south.

"The *G* zone lies 220 feet to the north of the *E* but dips steeply to the south. Development work was done on this zone on both the third and fourth levels.

"The *F* zone lies 45 feet south of the *A* which it parallels roughly in dip and strike. Stripping on surface prompted its investigation on the 100-foot level.

"Development work to date shows a production zone, approximately 1,500 feet in length and approximately 700 feet in width. At this time it is not possible to say the possibilities are yet delimited laterally.

"There remains considerable development work to be done on the third and fourth levels.

"Cross-cutting is under way to the north and south on both the fifth and eighth levels. Diamond drilling from the stations at No. 2 shaft to

the south indicate the downward extension of vein structures to the 8th level. The *A* zone appears to maintain a steep dip to the south of 85 degrees.

"On surface, 1,576.0 feet of diamond drilling was done in the north-easterly part of the property. Vein material was intersected but results were negative.

"TONNAGE:

"The ore indicated by development on *A*, *B*, *C*, *D*, *E*, and *F* zones is as follows:

TOTAL INDICATED ORE TO DEC. 31ST, 1936

"NOTE: In addition to the following tonnage, 45,000 tons of broken ore, of an average of 4.00 dwt., is on surface.

	TONS	AVERAGE GRADE UNCUT	AVERAGE GRADE CUT
Surface to first level.....	37,000	6.22	5.44
First to second level.....	58,000	6.45	5.36
Second to third level.....	80,000	6.35	4.79
Third to fourth level.....	81,000	6.44	4.47
Fourth to fifth level.....	22,000	6.95	4.99
TOTAL.....	278,000	6.43	4.92

"STOPE PREPARATION:

"On the *A* zone on the second level, the walls are slashed and the back is drilled off in the various ore-shoots for a total length of 610.0 feet. This is blasted and removed for a length of 300.0 feet. Timbering operations are in progress.

"Excavation was started on the mill and crushing plant sites in September. The mill building, 134 ft. by 183 ft., was completed at the end of the year. It will accommodate milling equipment to a capacity of 500 tons daily. The equipment being installed at this time will have a milling capacity of 300 tons daily, when completed. A relatively small outlay will permit an increase to 500 tons daily. The crusher plant and conveyor are well under way. A mill sub-station was completed with three 500 kv.a. transformers. An ore-bin was added to the shaft. A machine shop, electric shop, and plate shop, all under one roof, were completed and equipped during the period. Also, a modern change-house for underground employees is near completion. These buildings are all structural-steel frame, sheeted with two-inch material, insulated, and covered with corrugated iron. In addition, a steel shop and power house extension, of frame construction, were completed. Three double dwellings were completed in the Town of Bourlamaque to house Company employees. A general office and superintendent's dwelling were completed on this property.

"A new compressor with a capacity of 1,500 cu. ft. was added, which makes a total of 2,500 cu. ft. available for underground work. A new 125 h.p. boiler was installed for heating, with heating lines and return water lines. A six-inch water line, 6,500 feet in length, was laid to connect with the Lamaque Gold Mines, Limited, water supply".

STANDARD GOLD MINES, LIMITED

Some surface work was carried out on this property during 1936, and a diamond-drilling programme was completed to a total footage of 4,031 feet.

PASCALIS TOWNSHIP

BEAUFOR MINING CORPORATION

This Company has acquired the assets of Beaufor Gold Mines, Limited. Underground work on the property was continued throughout the year by arrangement with Perron Gold Mines. The Company has reported as follows:

"During the year the development work done was rather important. We did 4,028 feet of diamond drilling and 2,306 feet of drifting and cross-cutting. The greatest part of the cross-cutting was done on the second level. The work was slowed down for a while owing to the sinking of shaft No. 4 down to the 600-foot level. We are very hopeful of the results we may get on the opening-up of this new level".

PASCALIS GOLD MINES, LIMITED

During 1936, this Company carried out a diamond-drilling campaign. The total footage drilled amounted to 12,203 feet. It is reported that several intersections of gold ore were encountered.

PERRON GOLD MINES, LIMITED

In February, 1936, the Perron Gold Mines completed the construction of a 125-ton mill on the adjoining Beaufor property by an arrangement with the owners of the latter. The original plant included gravity separation equipment in addition to a cyanide unit, but, as little coarse gold is found in the ore, the flow-sheet has been changed to an all-cyanide process. A gradual increase in capacity was attained and, in the spring of 1937, the mill was treating an average of over 300 tons of ore per day.

Lateral work was continued at the Perron mine on the 175- and 325-foot levels, and stopes were opened above these horizons. Late in the year, the No. 4 shaft was continued to a depth of 705 feet, and new levels were established at the 475- and 625-foot horizons.

Gold production for the year amounted to 13,303.6 ounces from 52,124 tons of ore milled.

LOUVICOURT TOWNSHIP

FLEMING MINES, LIMITED

This Company holds the mining rights to a group of fifty-three claims situated in the southwest quarter of Louvicourt township. A well-mineralized zone carrying low copper values has been explored by surface work and diamond drilling, the latter totalling 4,440 feet. A geophysical survey of the property was under way in the spring of 1937.

LOUVRE GOLD MINES, LIMITED

This Company holds the mining rights to the former Wyeth-Jowsey group of claims.

In 1936, a total of 6,440 feet of diamond drilling was completed on the property. It is reported that interesting gold values were encountered in this work.

TIBLEMONT TOWNSHIP

SMITH-TIBLEMONT, LIMITED

This property is situated near the northeast end of Tiblemont lake. In June, 1936, an underground exploration programme was commenced. A two-compartment shaft was sunk on claim A-42807 to a depth of 175 feet, and some lateral work was carried out at the 150-foot horizon. Operations were suspended in the late fall.

A drift was driven along a sheared zone containing mineralized lenses of bluish quartz. The Company has reported that promising gold values were encountered over a length of eighty feet, and plans have been made to resume operations in the spring of 1937.

TIBLEMONT ISLAND MINING COMPANY, LIMITED

During 1936, some lateral work was carried out on the 485-foot level, but operations were confined mainly to diamond drilling and bulk sampling. A total of 4,431 feet of drilling was completed.

The Company reports the occurrence on the property of several mineralized zones carrying gold values of interest. In the fall of the year, the construction of a 50-ton pilot mill was commenced, with the object of determining the commercial feasibility of large-scale operations on these low-grade ores.

WAHU MINES, LIMITED

In the summer of 1936, this Company installed a 35-ton mill on the property formerly held by Murwood Gold Mines, Limited. Some ore broken in previous surface operations was milled and a small amount of gold produced. Later in the year, operations were suspended.

VAUQUELIN TOWNSHIP

AVOCALON MINING SYNDICATE

In the early months of 1936, underground work was continued on the 100-foot level of this mine. A geophysical survey was completed in the fall. Operations have since been suspended.

BRUELL GOLD MINES (1936), LIMITED

The Bruell property is situated to the west of that of the Avocalon Mining Syndicate. Surface work and diamond drilling were carried out, and plans were made to sink a small shaft. The drilling during the year totalled 3,000 feet.

GUILLET TOWNSHIP

BELLETERRE MINES, LIMITED

This Company was incorporated in 1936, with a capitalization of 1,500,000 shares of \$1.00 par value stock. It is a subsidiary of McIntyre Porcupine Mines, Limited, and holds the mining rights to a group of claims comprising approximately 1,000 acres. The adjoining Beauplace Mines property is also controlled by McIntyre.

In 1936, the three-compartment shaft was completed to a depth of 550 feet and levels were established at the 125-, 250-, 375-, and 500-foot horizons. Underground development, which has included raising and stoping, has shown that the ore deposit is not as large as surface work had indicated. It was found that the ore is confined to two lenses, totalling some 300 feet in length, and separated by about 100 feet of low-grade material. The construction of a cyanide mill of 100 tons daily capacity was completed in September, and it was soon brought to its rated capacity. Mill-heads are reported to average about 0.3 ounces gold per ton.

BEAUPPLACE MINES, LIMITED

This subsidiary of McIntyre Porcupine Mines, Limited, was incorporated in 1936. The property adjoins that of Belleterre Mines.

No work was carried on during the year, but plans have been made to resume operations in 1937. It is reported that previous work indicated a deposit containing 24,000 tons of ore averaging 0.415 ounces gold per ton. This ore will be mined, and transported by motor-truck to the Belleterre Mines mill.

DUVERNY TOWNSHIP

CENTRAL DUVERNY GOLD MINES, LIMITED

This Company was incorporated early in 1937 with a capitalization of 4,000,000 shares of \$1.00 par value stock. The property comprises lots 24 to 31, range VII, and the south half of lots 24 to 31, range VIII.

Several gold-bearing silicified zones have been found, and a large amount of deep trenching was performed to explore these occurrences. Early in 1937, plans were made to carry out a diamond-drilling campaign.

DUVERNY CONSOLIDATED GOLD MINES, LIMITED

This Company was incorporated in 1936, with a capitalization of 3,000,000 shares of \$1.00 par value stock. The property comprises the north half of lots 8, 9, and 10, range V, and lots 6 to 11 and the north half of lot 12, range VI.

Operations were commenced in the fall of 1936 and were limited to deep stripping and trenching. This work has exposed several gold-bearing zones.

FONTANA GOLD MINES, LIMITED

This Company was incorporated in 1936, with a capitalization of 3,000,000 shares of \$1.00 par value stock. The property comprises the north half of lots 12 to 21, range V, and the south half of lots 12 to 21, range VI.

Gold-bearing quartz lenses have been found on this property and, in the past, some surface work was carried out. Early in 1937, some very spectacular ore was uncovered, and plans were made to instal a mining plant and proceed with underground development.

LA COMPAGNIE MINIÈRE FRANCO-CANADIENNE

During the early winter months of 1936, an inclined shaft was sunk on this property to a depth of 120 feet. On completion of this work, all operations were suspended.

WEST DUVERNY GOLD MINES, LIMITED

This Company was incorporated in early 1937 with a capitalization of 4,000,000 shares of \$1.00 par value stock. In 1936, the property was under option to Dubuisson Mines, Limited, and a diamond-drilling programme was carried out to explore several gold-bearing quartz veins. The drilling totalled about 2,000 feet. The option was relinquished, and the present Company was formed to continue exploratory work.

LANDRIENNE TOWNSHIP

MINES DEVELOPMENT CORPORATION, LIMITED

In early 1936, the construction of a mill with an estimated capacity of 50 tons of ore per day was completed. The milling equipment includes a jaw-crusher, a ball-mill, a classifier, and two shaking tables, all operated by a steam engine through line shafting.

The shaft was continued to a depth of 345 feet and a second level was established at the 325-foot horizon. The main vein was cross-cut at a distance of 204 feet north of the shaft, and drifts were opened to east and west for a total length of about 200 feet. West of the cross-cut, a stope was developed over a length of 80 feet. The vein as exposed in the stope is from three to four feet in width, and is composed of interbanded quartz and schist. Some coarse free gold was observed.

The mill was operated intermittently throughout the year and a small amount of gold was produced. A carload of ore, shipped from a property outside the Province, was also milled.

DESJARDINS TOWNSHIP

FLORENCE RIVER (QUEBEC) GOLD MINES, LIMITED

This Company continued diamond drilling, from which, it is reported, encouraging results were obtained. Later in the year, operations were suspended. The annual report of Coniagas Mines, Limited, contains the following record of exploration on the Florence River property:

"An active diamond-drilling programme was carried out during the year over a surface length of some 4,000 feet, with shallow holes and a few deeper ones; maximum depth being 412 feet vertical. Results disclosed values of ore grade for varying widths up to 8 feet over 3,035 feet of length. The break exists across the property for some 8,000 feet, and is strong and persistent. To fully determine the value of this property, it became apparent that active mining development would have to be undertaken, requiring considerable monies. A request for an extension of the option agreement, or other arrangements to allow this to be done, was declined, so the

option lapsed. Diamond drilling to date has been encouraging, and it is felt that, at some future date, active mining development will require the monies expended under the option for which stock was taken down".

CURRIE TOWNSHIP

LAKE ROSE MINES, LIMITED

Underground work was continued on this property throughout 1936. A raise was carried from the adit level to the surface on the No. 2 vein; a winze was sunk from the adit level to a depth of 267 feet; and lateral work was commenced on two new horizons.

LEVY TOWNSHIP

OPEMISKA COPPER MINES, LIMITED

In the early winter months of 1936, a complete steam mining-plant was transported over the winter road from Rouleau Siding to the property. This equipment included a 60 h.p. locomotive-type boiler, an 8 in. by 6 in. double-drum hoist, and a 350 cubic foot Diesel-driven compressor.

New camp and mine buildings were erected. A three-compartment vertical shaft was sunk to a depth of 300 feet, and levels were established at the 150- and 275-foot horizons. Lateral work was mainly confined to the second level. Early in 1937, the shaft was deepened to 454 feet, and lateral work was commenced on the 525-foot level.

In addition to the drifting and cross-cutting performed during the year, 5,249 feet of diamond drilling was completed, most of which was from the 275-foot level.

The results of this work are described by G. S. MacKenzie on page 104 of this volume.

CHIBOUGAMAU DISTRICT

CONSOLIDATED CHIBOUGAMAU GOLDFIELDS, LIMITED

During 1936, this Company continued underground exploration and development work on the 250- and 500-foot levels of the property. Diamond drilling totalled 14,711 feet, of which 2,640 feet was from the surface and the remaining 12,071 feet from underground.

The annual report of the Company for 1936 records that the veins so far exposed are estimated to contain 55,625 tons of mineralized material averaging 0.27 ounces gold per ton and 1.25 per cent copper.

A more detailed review of developments will be found farther on in this volume (page 83).

MINING CORPORATION OF CANADA, LIMITED

In 1936, this Company held an option on the Rangely-Wolson group of claims at Gwillam lake.

An extensive programme of surface work was completed, and diamond drilling totalling 9,013 feet was carried out.

A complete review of these operations will be found on page 92 of this volume.

OBALSKI MINING CORPORATION, LIMITED

In past years, surface work and diamond drilling on this property were attended with encouraging results. Operations were resumed in 1936, and results were so promising that plans have been made to carry out an underground exploration programme.

More complete details in regard to developments will be found on page 95.

OTHER PROPERTIES

In 1936, diamond drilling and surface work was carried out on several other properties in the Chibougamau district. Detailed descriptions of these operations will be found in the report by G. S. MacKenzie that follows.

MINING PROPERTIES IN THE DISTRICT OF ABITIBI

By G. S. MacKenzie

INTRODUCTION

The writer spent the field season of 1936 examining many of the properties in the District of Abitibi on which discoveries have been made in recent years. Only that portion of the District lying between the Bell river on the west and Chibougamau lake on the east was covered. Most of the properties described lie more particularly within certain areas in this large region, notably the Chibougamau and Opemisca areas to the east and the Currie Township area to the west. However, during 1936 there was much general prospecting and some development work in areas lying in the intervening country and farther north, such as the Opawica, Father Lake, Pusticamica, Lac Inconnu, and Lac La Trêve areas.

General geological mapping was being carried on during the season at several places within the District. For the Quebec Bureau of Mines, G. Vibert Douglas mapped an area on the Bell, north of the Florence and Wedding rivers, and W. W. Longley an area about Quévillon lake, in the Kamshigama Lake map-area. The Geological Survey of Canada had three parties in the District. G. W. H. Norman was engaged in detailed geological mapping over the eastern part of the Opemisca map-area; and J. C. Sproule and B. C. Freeman continued their work in the eastern half and the western half, respectively, of the Waswanipi area. Additional information concerning some of the properties described in the present report, as well as data relating to others not here described, will be given in the reports of these several geologists.

The writer is indebted to the many individuals and companies whose properties were visited, for courtesies received and information supplied. W. Nowers Asbury, student at McGill University, rendered capable assistance in the field.

McKENZIE TOWNSHIP

CONSOLIDATED CHIBOUGAMAU GOLDFIELDS, LIMITED

Consolidated Chibougamau Goldfields, Limited, hold several large groups of claims in McKenzie and other townships. Development work has been centred chiefly at the Cedar Bay property in McKenzie township. In September, 1934, the Consolidated Mining and Smelting Company of Canada acquired an option on a controlling stock interest in the Company and have had charge of exploration on the several properties since that time.

CEDAR BAY PROPERTY:

The main discovery on this property is on claim Q.581, at Cedar bay, Doré lake. The general results of surface trenching and diamond-drilling up to September, 1934, at which time the property was examined by the

writer, have been given in an earlier report ①. The property has also been described by Mawdsley and Norman ②. Information as to the development work accomplished since September, 1934, was obtained by a visit to the property in June and July of 1936. The writer was given access to underground workings, maps, drilling logs, and assay plans while at the property, and he has since consulted plans covering the work up to December 1st, 1936, in the Montreal office of the Consolidated Mining and Smelting Company. Where values are given in the present report they represent the results of assays made by the Company, though in some cases averages have been calculated by the writer.

The underground development work comprises a shaft sunk to a depth of 500 feet and drifting and cross-cutting on two levels, at 250 feet and 500 feet (Figures 3 and 4). In addition, there has been exploration from these levels and below the 500-foot level by means of diamond drilling.

Underground development has shown, as was apparent on the surface, that the mineralization occurs along sheared zones in altered anorthosite. This rock exhibits considerable variety, due to original differences in texture and, perhaps, in composition, and also to the varying type and intensity of subsequent alteration. Some facies are coarse and porphyritic, others even and fine grained. In some places, the rocks are highly chloritized, in others kaolinized or silicified. The chloritization tends to occur along and outward from the sheared zones. It was apparently developed by solutions closely related in origin to those which later deposited the quartz-sulphide-gold mineralization along these zones.

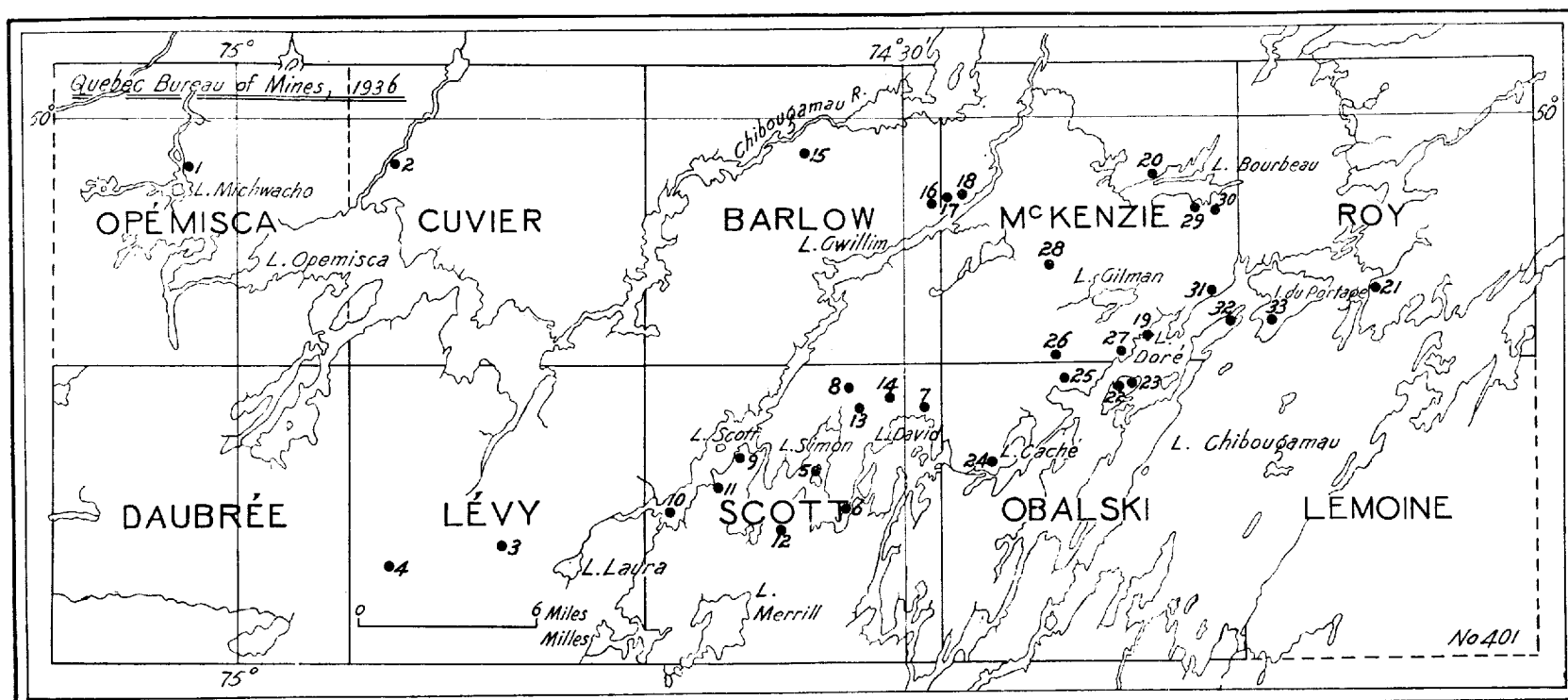
A feature not well displayed on the surface, but clearly seen underground, is the presence of dyke-like and irregular masses of rocks of intermediate and basic composition, referred to as andesite and gabbro. They are grey to green in colour and mostly fine grained. In some places these intrusives have chilled edges against the anorthosite but in others the contacts are difficult to follow, especially where the rocks are sheared. Some occurrences closely resemble the fine grained facies of the anorthosite and are probably closely related in origin to that rock. Some of the dyke-like masses are up to 30 feet wide and have been traced fairly definitely for distances up to 300 feet. Others are only a few inches wide and a few feet long.

A much-sheared dyke of quartz porphyry, similar to that exposed on the surface, north of the major northwest sheared zone, is present along the same zone on the 250-foot level. The 210 vein occurs along and near this dyke.

The main structural features apparent on the surface are present also at depth (Figure 2). The dominant feature is the northwest-trending, vertically-dipping sheared zone. The shearing on this zone is more intense than on the main east-west mineralized zone. Another sheared zone encountered to the south of it on the 250-foot level has a strike of N.80°W. and a dip of 75 degrees to the south. There is also shearing along other directions, and to some extent the main directions of shearing are crossed by small pre-mineral faults along which the mineralization also occurs. The main shearings, at least in part, tend to parallel the gabbro and an-

① Que. Bur. Mines, Ann. Rept., Pt. A, 1934, pp. 135-138

② Geol. Surv., Can., Mem. 185, 1935, pp. 78-81.



- | | | |
|-------------------------------------|----------------------------------|------------------------------|
| 1 Consolidated Mining & Smelting | 12 Chibmac Mines | 23 Blake-Chibougamau Mining |
| 2 Norlake Mining | 13 Ryan Claims | 24 Chibougamau Properties |
| 3 Opemisca Mines | 14 O'Leary-Malartic Mines | 25 Obalski Mining |
| 4 Opemisca Copper | 15 Croteau Group | 26 Garth-Chibougamau Synd. |
| 5 Mc Kay Expl. (Duchesne Is. Group) | 16 Rangely Claims | 27 Lake Doré Mines |
| 6 " " " (Smith Claims) | 17 Rangely-Wolson Group | 28 Central Chibougamau Mines |
| 7 " " " (David Lake Group) | 18 Ryan Claims | 29 Capital Rouyn Mines |
| 8 " " " (William's Lake Group) | 19 Cons. Chib. (Cedar Bay Group) | 30 Bourbeau Lake Chib. Mines |
| 9 " " " (Malouf Group) | 20 " " (Bourbeau L. Group) | 31 Norlake Mining |
| 10 " " " (Scott Lake Group) | 21 " " (Bear Bay Group) | 32 Chib. Peninsula Mines |
| 11 Rubec Mines | 22 " " (Merrill Is. Group) | 33 Wawbano Mines |

FIGURE 1.—Sketch-map showing mining properties of Chibougamau region, referred to in the report.



desite dykes. This is especially apparent in the case of the major north-west zone and the east-west zones near and northwest of the shaft. To the east, the importance of the dykes in localizing the shearing is difficult to estimate, as they are not there easily distinguished from the chloritized anorthosite. There are also numerous fractures and fault-planes younger

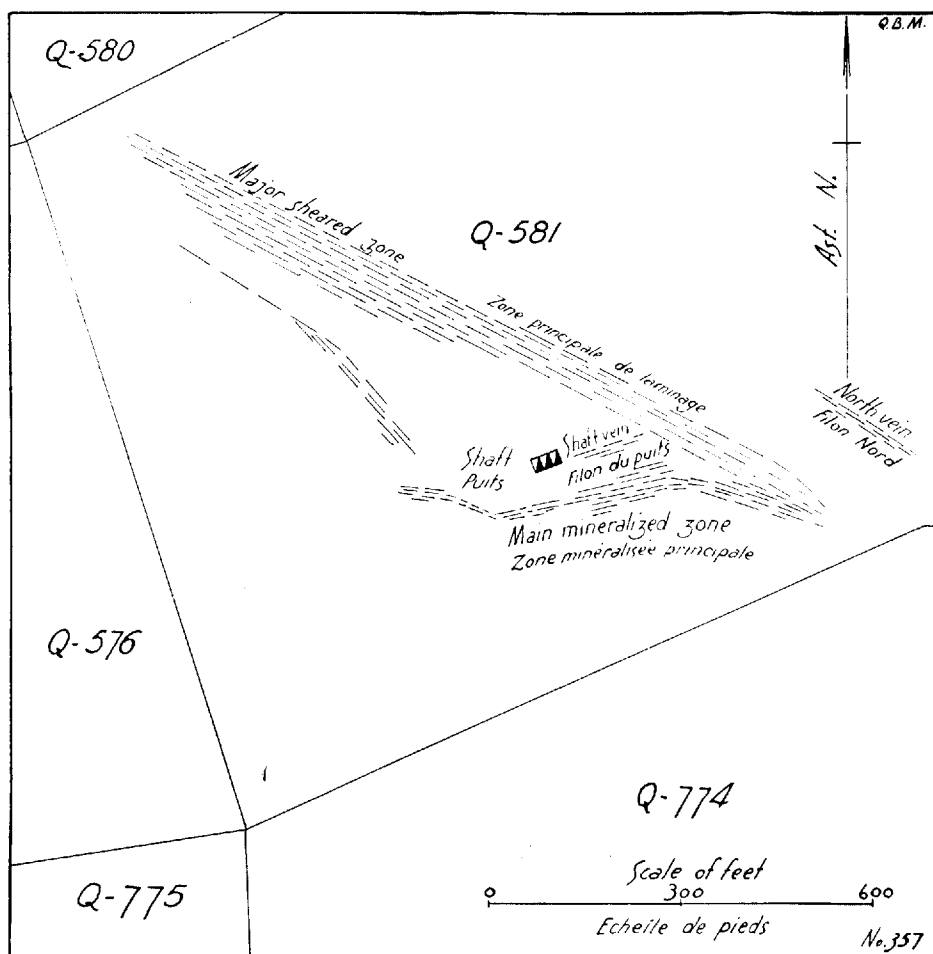


FIGURE 2.—Sketch-map of main shear and mineralized zones, Consolidated Chibougamau Goldfields, at Cedar Bay, McKenzie township.

than the main shearing and mineralization. Veins of calcite or quartz, or of both minerals, occur along these, a series of them often forming a band with a width of two feet or so. Gouge, slickensiding, and brecciation are conspicuous along some of the fault-planes, giving evidence of differential movement. Some of the faults parallel the earlier northwest and east-

west shearing in strike but dip much less steeply, usually to the south. Others strike across the shearing, many in northeast or northwest directions, with dips frequently around 45 degrees. On the 500-foot level, faults are encountered at four points within a distance of 400 feet along the major northwest shear-zone. They follow the strike of the zone and dip 65 degrees south. All four may be parts of one continuous fault. There has undoubtedly been some differential movement, but its extent could not be determined. No very great displacement is believed to have occurred in view of the, at least general, continuity of the earlier shearing

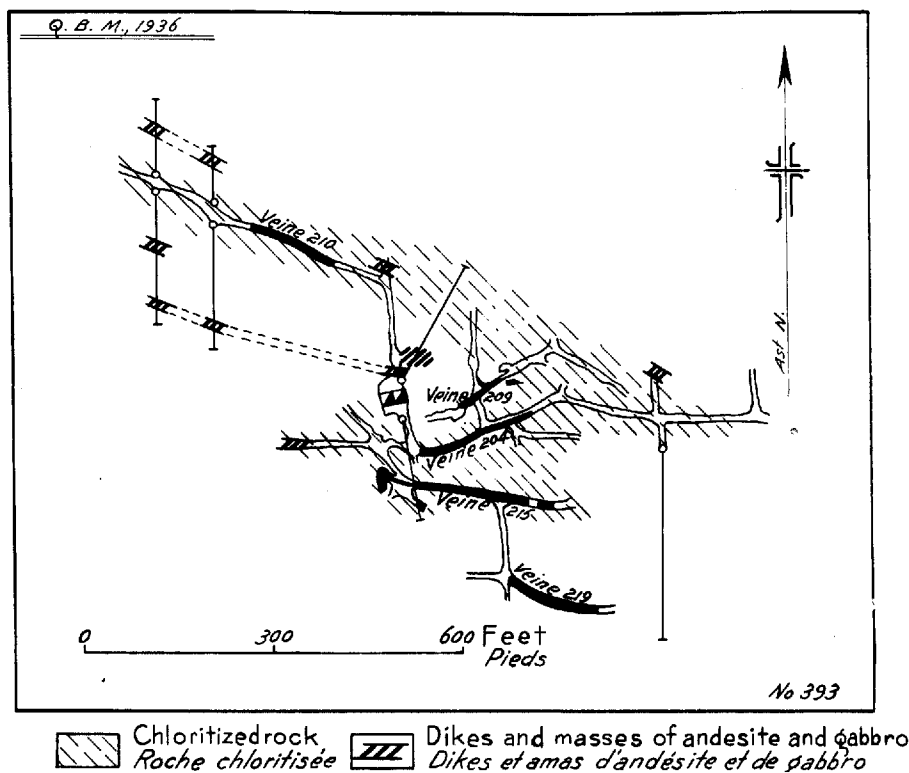


FIGURE 3.—Plan of 250-foot level, showing ore-zones and diamond-drill holes. Consolidated Chibougamau Goldfields.

and chloritization through the hanging-and foot-walls. Three faults cross the southeast end of 210 vein on the 250-foot level within a distance of 20 feet. All strike northeast and dip from 45 to 65 degrees southeast. Horizontal displacements of two feet and less were observed on two of them. In each case, the southeast side has moved northeast. A vertical component of movement is indicated by slickensides, but its extent could not be measured. These faults do not appear to persist to the 500-foot level. In several places, vertical displacements of $1\frac{1}{2}$ feet were observed on faults

with less gouge and vein-filling than those discussed above and others occurring elsewhere underground. Both normal and reverse faults were observed. The earlier shearing planes and the younger fault and fracture planes tend to have warped and curved surfaces.

There is evidence of more than one stage of mineralization. Siderite, accompanied by some sulphides, would appear to be an early stage, lacking important associated gold values. The best gold values seem to occur in massive sulphides, mostly pyrite with some quartz present. One vein carrying good gold values consists largely of grey quartz, shattered and cemented by veinlets of white quartz, with pyrite and chalcopyrite occurring in both. Minor amounts of pyrite and chalcopyrite also occur in the later quartz and calcite veins along the fractures and fault-planes crossing the strike or dip of the earlier shearing and mineralization. Gold values along these latter veins are unimportant.

Some seven ore-zones had been outlined by the underground mining up to December 1st, 1936, though these are not notably extensive. Most of the intersections obtained in the diamond drilling from the surface may be referred to these ore-zones. Some may mark veins lying between the surface and the 250-foot level which do not persist to that depth; others mark mineralization encountered in the underground mining which was not found to be of commercial dimensions or grade. The dimensions and average values for these ore-shoots are as follows. The widths and values have been computed from averages of both face and back samples:

VEIN	LENGTH (feet)	WIDTH (feet)	AVERAGE VALUES		
			GOLD (oz./ton)	SILVER (oz./ton)	COPPER (per cent)
204	189	2.4	0.29	0.29	1.33
209	60	2.8	0.31	0.23	1.75
210	140	4.1	0.30	0.39	0.62
215	173	3.7	0.27	0.43	1.80
219	206	1.8	0.17	0.19	0.83
404	120	2.0	0.38	0.32	1.49
416	27	3.0	0.13	0.21	0.76

Vein 210 on the 250-foot level and vein 416 on the 500-foot level occur along the major northwest sheared zone. Vein 210 is evidently intersected in one of the surface diamond-drill holes at a vertical depth of 125 feet. It was not found on the 500-foot level but was intersected in a hole drilled upward from that level at a point 90 feet below its location on the 250-foot level. At the intersection, there was two feet of mineralization carrying 1.01 ounces in gold and 0.85 ounces in silver per ton, and 2.5 per cent copper.

Fair intersections obtained in two surface holes at depths of 100 feet below the main surface exposures of the major northwest zone may mark an ore-shoot lying between the surface and the 250-foot level.

Vein 204 on the 250-foot level lies along the main east-west mineralized zone. Intersections in surface drill-holes at vertical depths of 64 and 132 feet probably mark the upward extension of the vein, and those at depths of 290 to 329 feet the downward extension. No mineralization of equivalent dimensions is present on the 500-foot level at the downward projection of this vein.

Other intersections obtained along the general zone east of the 204 vein at vertical depths of 180 and 350 feet are probably related to mineralization encountered on the 250-foot level but not of commercial grade and width. Very good values and widths obtained in one hole from 19 to 91 feet below the surface near the east end of the zone may indicate an ore-shoot not persisting down to the 250-foot level.

The Shaft vein, exposed on the surface for 90 feet northeast of the shaft, in the angle between the major northwest sheared zone and the main mineralized zone, may extend down to the 500-foot level. It is represented

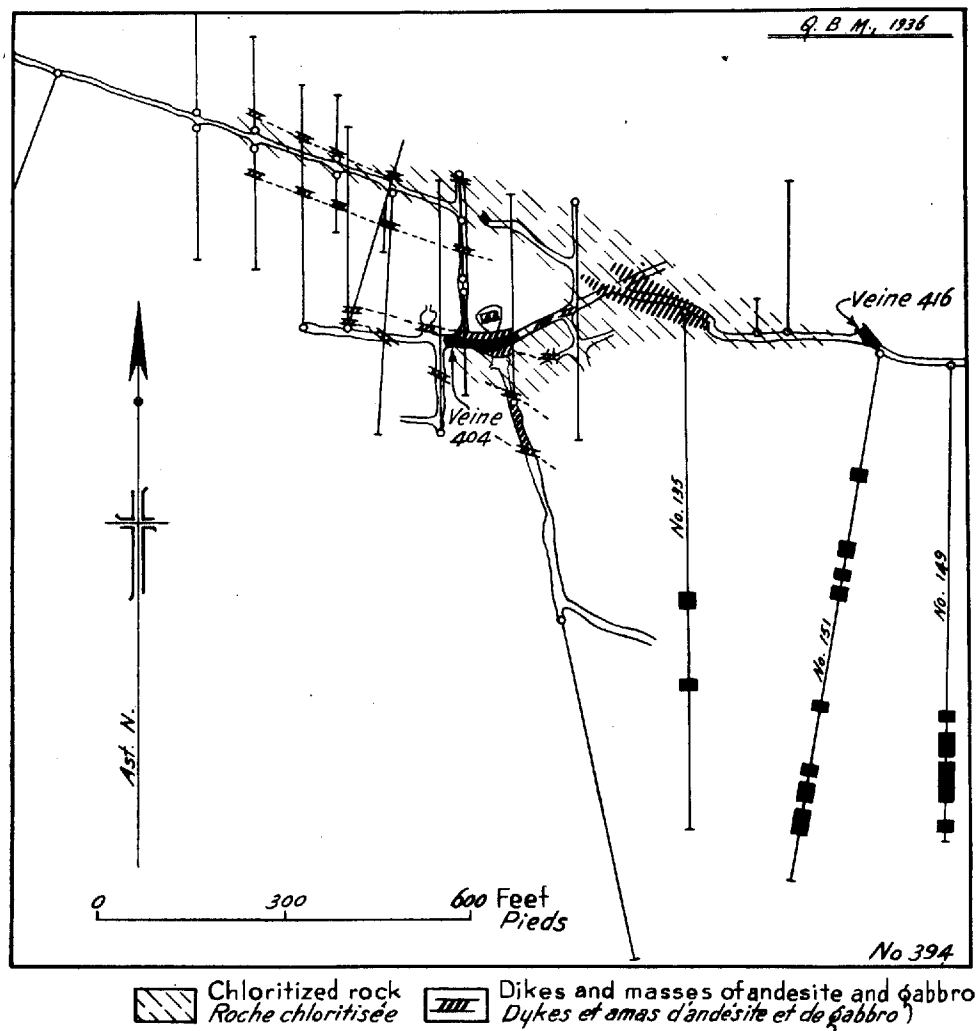


FIGURE 4.—Plan of 500-foot level, showing ore zones and diamond-drill holes. Consolidated Chibougamau Goldfields.

on the 250-foot level by the 209 vein, and between that level and the surface by intersections in three diamond-drill holes. The 404 vein on the 500-foot level is along the dip of the above vein, but intersections between the two levels are lacking. Some mineralization was cut in four holes drilled from the 500-foot level below the 404 vein, at depths of 70 to 100 feet. Gold values range from 0.06 to 0.12 ounces per ton over widths up to five feet.

Vein 215 on the 250-foot level lies to the south of, and is considered separate from, the main mineralized zone. However, it has a dip of 75 degrees south, so its upward continuation would tend to approach this zone. Included in the vein are three closely located and aligned shoots. In drifting to the east of this vein, a further 25 feet of mineralization has been found which averages 4.2 feet in width and carries an average metal content of 0.14 ounces in gold and 0.49 ounces in silver per ton, and 0.76 per cent copper. Intersections in one surface drill-hole at vertical depths of 183 and 192 feet probably represent the upward extension of this vein.

Vein 219, southeast of 215, was not fully explored at December 1st. Laterally, it may extend westward, but good intersections are lacking in a hole, drilled horizontally from the 250-foot level, crossing the strike of the vein 100 feet to the east. Several feet of barren quartz were, however, cut by the drill at this point. The upward continuation of this vein would lie south of the surface diamond-drilling.

Persistence to the 500-foot level is not indicated for either the 215 or the 219 vein in a drift and a horizontal diamond-drill hole, 250 feet apart, extending south under the downward projections of these veins.

Diamond drilling subsequent to July, 1936, in a horizontal and southward direction from the eastern part of the 500-foot level has indicated mineralization with interesting widths and values. This mineralization is not related to any previously found on the surface or in underground workings, as it mostly underlies the lake. In hole 135 (Figure 4), 10.7 feet of mineralization was intersected carrying 0.41 ounce in gold and 0.20 ounce in silver per ton, and 5.34 per cent copper; or, over a width of 16.7 feet, including the above 10.7 feet, the results were: gold, 0.31 ounce and silver 0.14 ounce per ton; copper, 3.64 per cent. Farther south, in the same hole, are 8.0 feet of mineralization carrying 0.14 ounce in gold and 0.10 ounce in silver per ton, and 0.79 per cent copper. Mineralization was also intersected in holes 151 and 149, east of the above, at a number of points. In hole 151, 0.25 ounce in gold per ton is present at one place over a width of 8.4 feet, and at another, 0.40 ounce over 1.7 feet. In hole 149, the gold values are lower, but there are considerable widths of mineralization in this hole, and also in hole 151, carrying good copper values. Thus, in hole 149, 2.75 per cent copper was obtained in one intersection of 29.5 feet; in hole 151, 4.60 per cent over a width of 5 feet; while in both holes, lower percentages of copper occur over widths up to 60 feet. It is not yet clear how the mineralization is related from hole to hole. The Company is at present advancing a drift on the 500-foot level to develop this section, and it is being explored at greater depths by diamond drilling. Important mineralization was not encountered in drift 401S or in drill hole 150, west of this section.

At the annual meeting of the Company in March, 1937, an estimate of the quantity of mineralized material so far exposed was given as 55,625 tons, averaging 0.27 ounces in gold per ton and 1.25 per cent copper. Of this amount, 41,925 tons was estimated in workings on the 250-foot level.

BOURBEAU LAKE GROUP:

This group, also in McKenzie township, lies around the western part of Bourbeau lake. It includes eighty claims, Nos. Q.13936 to 14013, 14048, and 14049. The surface showings on these claims have been described in an earlier report ^①. In the winter of 1934-35, the Company drilled several holes under the extensive sulphide mineralization on claim Q.13979. They report that, as on the surface, no important gold or copper values were obtained. Copper values nowhere exceed 0.30 per cent. One hole was drilled in the vicinity of the small, mineralized, quartz veins on claim Q.14009, but the veins were not intersected.

BEAR BAY GROUP:

The Consolidated Chibougamau Goldfields claims in Roy township, known as the Bear Bay group, are described on page 98.

MERRILL ISLAND GROUP:

Diamond drilling on the Company's water claims of the Merrill Island group, in Obalski township, is discussed in connection with the operations of the Blake Chibougamau Mining Corporation (p. 96). The mineralization disclosed by the drilling is a continuation of that found on Merrill island.

NORLAKE MINING CORPORATION

The Doré Lake group of this Company extends westward from the McKenzie-Roy township line. The claims lie mostly in the bed of Doré lake, but some are on the north shore. The claims included in the group are Nos. Q.13810, 13811, 13813 to 13819, 14618 to 14622, 15259, 15284 to 15293, 15690, 15691, and 16751 to 16778. The property was under option to the Premier Gold Mining Company, Limited, during the winter and summer of 1936, but the option has since been relinquished.

A geophysical survey of the property was made during the winter of 1936 under the direction of Dr. Hans Lundberg. A number of mineralized zones were indicated by the survey. These are mostly on the claims along the north shore of the lake, though two are beneath the water near the south shore. Surface trenching and diamond drilling in nineteen holes under eight of the 'indications' verified the presence of mineralization. This is for the most part sulphides in sheared zones in anorthosite, or in volcanics near their contact with the latter. The sulphide is mainly pyrite, with some pyrrhotite and chalcopyrite. Quartz and, in places, considerable carbonate, are also present. The Company reports copper values over narrow widths both at the surface and in the drill holes, but only low gold. Exploration is still being carried on.

The Company also explored a group of forty-five claims in Roy township, northeast of Bourbeau lake, but no important discoveries were made there during the summer of 1936.

For developments on the Company's property in Cuvier township, see page 106.

^① Que. Bur. Mines, Ann. Rept., Pt. A, 1934, p. 138.

BOURBEAU LAKE CHIBOUGAMAU MINES, LIMITED
(New Liskeard, Ontario)

This Company holds several groups of claims in the Chibougamau region. Most work has been done on two groups at the east end of Bourbeau lake, McKenzie township. That completed up to September, 1934, on a large sulphide body crossing claims Q.14239 and 14240 has been referred to in an earlier report ①. Results of further sampling in a rock trench across the east end of this sulphide zone, as reported by the Company, show an average gold value of \$2.12 per ton over a width of 60 feet, with values up to \$6.30 per ton over three-foot sections. Another, parallel sulphide zone was discovered 200 feet north of this and traced for a distance of 65 feet with an average width of three feet. Assays of ten channel samples taken by the Company across the width of the zone, and at intervals along it, show gold ranging from 0.02 ounce to 0.22 ounce per ton and copper 0.60 to 4.40 per cent, the combined gold and copper values averaging \$7.11 (gold at \$35.00 per ounce).

In January and subsequent months of 1935, the Company carried on diamond drilling on the west side of water claim Q.14233, at the east end of Bourbeau lake. The drilling was done in an attempt to pick up the continuation of the Sharpe vein which occurs on the property of Northern Chibougamau Mines, to the west ②. Nine holes were drilled. Five of these intersected mineralized quartz in altered quartz diorite and indicated the presence of a vein striking in the same direction as the Sharpe vein (N.85°E.) but lying about 250 feet to the south of it. The drilling explored the vein for 100 feet along its strike, one hole attaining a vertical depth of 200 feet. Some gold values were obtained in each of the five holes that intersected the vein. These occurred over core lengths of 1 to 5.4 feet and were best in the deepest hole, where, over the latter width, the gold value was \$14.22 per ton, while assay of the sludge over a ten-foot core length yielded \$19.60 per ton. Due to the break-up of the ice, the vein was not fully explored.

Surface exploration on the mainland, east of Bourbeau lake and about half a mile east of the above vein, has disclosed several other quartz veins. These are not commercial in size or grade, though one yielded assays up to \$7.00 per ton in gold. They are of interest, however, in that they occur along the general strike of the Sharpe vein and the vein underlying the lake.

CAPITAL ROUYN GOLD MINES, LIMITED

This Company was doing diamond drilling on a group of claims just south of Sullivan bay, at the east end of Bourbeau lake. The group is bordered on the northwest by the claims of Northern Chibougamau Mines and on the northeast by those of Bourbeau Lake Chibougamau Mines. The drilling extended northward under the lake to explore for veins paralleling the strike of those on the adjoining properties and to investigate a north-east-trending fault or sheared-zone. Results of the work are not yet known to the writer.

① Que. Bur. Mines, Ann. Rept., Pt. A, 1934, p. 139.

② Que. Bur. Mines, Ann. Rept., Pt. A, 1934, p. 138.

CHIBOUGAMAU-PENINSULA GOLD MINES, LIMITED

This Company has a group of claims lying across the northeasterly extremity of Gouin peninsula, between Doré and Chibougamau lakes, in McKenzie township. When the property was visited in July, 1936, those in charge reported that no discoveries had been made up to that time. A geophysical survey of the claims was being made under the direction of Dr. Hans Lundberg.

GARTH-CHIBOUG GOLD SYNDICATE, LIMITED

This Company has a group of claims lying just north of the McKenzie-Obalski township-line and north of the Cachée Bay group of claims of the Obalski Mining Corporation. Considerable work has been done on an east-west sheared zone on the property. The zone occurs along and near a contact between dioritic rocks to the south and volcanics to the north. The zone had been traced for a length of 700 feet when examined by the writer in July, 1936. For about 200 feet along the western part of the zone, there are some large and small veins of quartz. In the central part of this 200 feet there is probably 50 per cent quartz over a width of 30 feet in three or more lenticular veins, whereas at the western extremity only a narrow vein is present. Quartz is also less abundant eastward, but the shearing becomes more intense. The larger quartz veins are composed of white, glassy quartz with little or no visible mineralization, though the adjacent schist contains some pyrite. In the more highly sheared part of the zone, to the east, however, where the veins are smaller, pyrite is present over good widths. Results of systematic sampling were not available at the property, but A. Authier, who was in charge of the work, reported that gold values of \$12.00 per ton (gold at \$35.00 an ounce) were obtained from assays across the zone where it was highly sheared and injected with narrow quartz veins and stringers. Some diamond drilling has since been done to test the zone at depth.

RANGELY-WOLSON PROPERTY

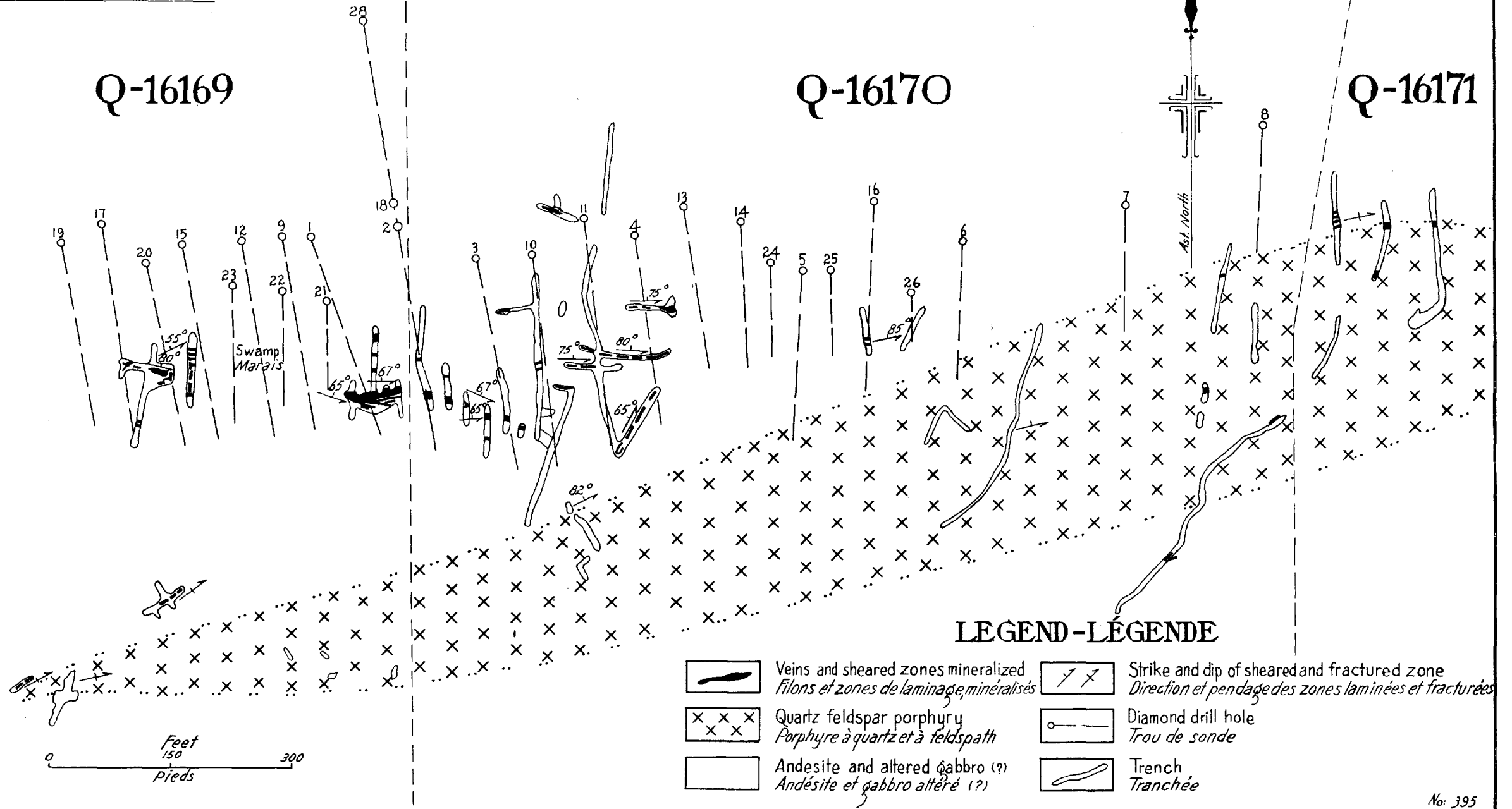
This property includes twenty-five claims, Nos. Q.16158 to 16172, lying north of Gwillim lake and bounded on the west by the Barlow-McKenzie township-line. During the winter of 1934-35, McIntyre Porcupine Mines, Limited, held an option on the property and did some 7,000 feet of diamond drilling in twenty holes, after which they relinquished their option. In March of 1936, the Mining Corporation of Canada, Limited, optioned the property. They did extensive surface trenching and some 2,000 feet of diamond drilling in nine holes. At the end of August, 1936, the option was dropped.

The chief showings on the property are about 2,000 feet north of the lake (Map No. 395). They occur across the middle portion of claim 16170 and extend westward into claim 16169 and eastward into claim 16171. The mineralization occurs along sheared and fractured zones in gabbroic-looking rocks which are probably altered volcanics, as they apparently grade into finer-grained facies with remnants of pillow structure. A zone of quartz-feldspar porphyry intrusives has been traced across the southern

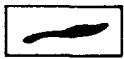
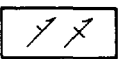
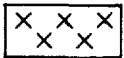
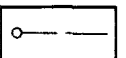

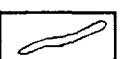
Q-16169

Q-16170

Q-16171



LEGEND - LÉGENDE

- | | | | |
|---|--|---|--|
|  | Veins and sheared zones mineralized
<i>Filons et zones de laminage, minéralisés</i> |  | Strike and dip of sheared and fractured zone
<i>Direction et pendage des zones laminées et fracturées</i> |
|  | Quartz feldspar porphyry
<i>Porphyre à quartz et à feldspath</i> |  | Diamond drill hole
<i>Trou de sonde</i> |
|  | Andesite and altered gabbro (?)
<i>Andésite et gabbro altéré (?)</i> |  | Trench
<i>Tranchée</i> |

MAP NO. 395.—Surface plan of Rangely-Wolson option, Gwillim lake, Chibougamau district.

part of the claims for some 2,000 feet in a direction of N.75°E. The zone is about 300 feet wide at the most, and within it are individual dykes or irregular masses of porphyry up to 100 feet wide.

The most important of the mineralized zones has a general east-west trend, but in detail the shearing and the course of the zone depart several degrees from this direction. Mineralization occurs along this zone over a length of 450 feet, though the most westerly surface exposures are separated from the easterly ones by 200 feet of swamp. Mineralization is heaviest just east of this swamp, where it attains widths up to 21 feet. Several feet of this width, especially on the north, are occupied by irregular veins consisting of nearly equal proportions of quartz and carbonate, not notably mineralized. Cutting these veins, and the sheared rock elsewhere along the zone, are narrow veins and lenses of quartz, well-mineralized with pyrite and chalcopyrite. Some pyrite is also disseminated in the sheared rock. In at least one place, tourmaline is enclosed in the pyrite, and elsewhere on the property it occurs in quartz. Toward the eastern and western extremities of the zone, carbonate is not so abundant as in the central and wider portion.

Surface sampling by McIntyre Mines and others along the eastern 200 feet of this zone indicated an average gold value of \$12.80 per ton (gold at \$35.00 per ounce) over an average width of 15.6 feet. Trenching and sampling at closer intervals by the Mining Corporation yielded a lower figure, namely, \$9.36 per ton in gold for an average width of 10.2 feet for the same 200 feet of the zone, as calculated by the writer from results of the sampling supplied by the Company.

Where the main zone is exposed west of the swampy ground, there is one lenticular quartz vein, about 25 feet in length and up to 3.5 feet wide, which carries good gold values. Smaller lenses and veinlets to the east and west of this vein also carry some gold. The rocks here are much carbonated and drag-folded and some of the quartz follows the folds, a feature also to be seen in other places on the property.

Diamond drilling by McIntyre Mines indicated mineralization for a length of 400 feet at a depth of 200 feet, and showed the zone to dip 67 degrees to the north. Average gold values for this length, calculated from assays of drill core, are given as \$8.24 per ton over an average width of 10.3 feet. Three additional holes were drilled by the Mining Corporation under the swampy ground toward the west end of the zone. These holes, which were shallower than those put down by McIntyre Mines, indicated scattered values at intervals over widths up to 40 feet. However, the individual values and widths are not such as to suggest continuous commercial ore between the eastern and western parts of the zone, at least near the surface.

Two, or more, less extensive veins are indicated by diamond drilling and surface trenching within a zone that extends eastwardly, for some 450 feet, from a point about 200 feet northeast of the eastern end of the main zone. In some intersections, very good gold values occur over widths of three feet and less, and in others there are low gold values over widths up to fourteen feet; but persistent veins of commercial grade do not seem to be present. Surface exposures show quartz occurring along one or more fractures or sheared zones. The quartz and wall-rock are in some places heavily mineralized with pyrite and chalcopyrite, but in others are almost barren.

In the eastern part of the property, pyrite mineralization is found at the contacts between silicified volcanics and shattered porphyry. At the surface, however, and in one diamond-drill intersection, this material carries no more than a trace of gold, the Company reports.

Some 150 feet east of the east end of the main zone, a fairly strong fracture striking N.30°E. has been traced for about 80 feet. Quartz and carbonate, with some pyrite, occurring along this fracture carry up to \$2.45 in gold per ton over a width of 1.5 feet. Small veinlets carrying some gold values have also been disclosed at other points by the surface work and diamond drilling.

RYAN CLAIMS

J. Ryan optioned a number of claims adjoining the Rangely-Wolson property, on the east, in August, 1936. Surface exploration on these claims had just commenced at the time the writer visited them and some mineralized shear-zones were being uncovered. No sampling had been done on them at that time.

LAKE DORÉ MINES, LIMITED

During the summer of 1935, this Company did much systematic exploration over forty-five claims in McKenzie and Obalski townships. The claims lie on and northward from Doré lake and adjoin the Cedar Bay property of Consolidated Chibougamau Goldfields on the east.

The following account of the results of the development work is summarized from a report by Charles L. Coleman, who was in charge of the work.

The most important find on the property consists of chalcopryrite-pyrite mineralization along a fractured zone in massive anorthosite. The zone occurs in the northeast corner of claim Q.14032, and has been traced for 500 feet northwestward from the shore of Doré lake. For a length of 255 feet, it has an average width of 1.5 feet, and assays of channel samples taken over this length indicate a gold value of \$2.50 per ton and 6.8 per cent copper. Locally, the mineralization widens to seven feet and erratic, high values were obtained. A parallel mineralized zone, 600 feet to the north, yielded inconsistent assays.

On claim 14028, another narrow vein of chalcopryrite mineralization was traced northwest for 40 feet from the shore of Doré lake, and its possible continuation is indicated by similar mineralization 250 feet farther northwest. The vein carries gold values up to 0.3 ounces per ton, but only over widths of a few inches.

A trench, 2,320 feet long, was opened along the east boundaries of claims 14938 and 14939 but it did not reveal a northwestward continuation of the mineralized zone that occurs on the adjoining Cedar Bay property of Consolidated Chibougamau Goldfields.

A sulphide zone crossing claim 15673 in an east-west direction, and extending into claim 15672 on the east and claim 15674 on the west, was explored. Pyrite occurs abundantly along the zone and is nearly massive in places over widths of 50 feet. Chalcopryrite is present locally. Gold values, however, are not encouraging, though they are as high as \$6.00 per ton in the oxidized material ①.

① Que. Bur. Mines, Ann. Rept., Pt. A, 1934, p. 141.

Some further work was done on a showing in the northeastern corner of claim 14031, which had been diamond drilled by R. T. Gilman in 1929 ^①. The showing consists of quartz, with chalcopyrite and pyrite mineralization, in schist. Sampling at the surface exposure where the original find was made gave only low gold values and about two per cent in copper. The zone was traced 1,300 feet northwest into claim 14030. In this part of the zone, chalcopyrite is less evident and gold values range from \$0.40 to \$10.00 per ton.

CENTRAL CHIBOUGAMAU GOLD MINES, LIMITED

This Company holds three groups of claims in McKenzie township. During the summer of 1936, a gold-bearing quartz vein was discovered along an east-west sheared zone on one of the groups, in the west-central part of the township. The discovery was made in the fall, after the writer had left the area. Good gold values are reported in the quartz. A series of test pits are being opened on the vein and the Company plans to sink a shaft to a depth of 100 feet. They have also contracted for 5,000 feet of diamond drilling.

OBALSKI TOWNSHIP

OBALSKI MINING CORPORATION

The property of the Obalski Mining Corporation consists of a group of 25 claims, north of Cachée bay. Development work carried out on these claims in 1928 and 1929 has been described by Retty ^② and by Mawdsley and Norman ^③. No further work was done on the property until the summer of 1936, when the old trenches were cleaned out and sampled and much new trenching was completed, largely after the writer visited the property in July. In the fall, a geophysical survey of the property was made under the direction of Dr. Hans Lundberg.

Some six mineralized shear-zones were discovered in the course of the earlier work on the claims and these have been further opened-up by the recent exploration (Map No. 396). The three most important veins, designated *A*, *C*, and *D*, are in altered diorite. Vein *A* has been uncovered for 256 feet and the Company reports that close channel sampling throughout this length has indicated values of \$9.95 in gold per ton (gold at \$35.00 an ounce) and 2.76 per cent copper, over an average width of 50 inches. Values are highest in the central and widest part of the zone.

Vein *D* has been traced for 720 feet by trenching, and geophysical work suggests its continuation westward. Along 528 feet of this zone, the Company reports that the vein material alone, for a width of 15.9 inches, averages \$38.15 per ton in gold, or with the mineralized wall-rock included, the average is \$17.50 over a width of 38.4 inches. Toward the east end of this 528 feet is an ore-shoot 110 feet in length which, for the vein material alone, has an average gold value of \$62.48 per ton over an average width of 20 inches.

^① Que. Bur. Mines, Ann. Rept., Pt. D, 1929, p. 69.

^② Que. Bur. Mines, Ann. Rept., Pt. D, 1929, pp. 60-62.

^③ Geol. Surv. Can., Mem. 185, 1935, pp. 70-74.

Vein *C* has been traced by trenching for 600 feet. Within this distance are four separate segments carrying important gold values. Two of these are toward the east end of the vein and two toward the west end. The surface sampling indicates that the intervening portions carry only low gold values.

Vein *F* is in the granite and anorthosite to the southeast, and along the strike, of vein *A*. Vein *G* is south of vein *F*, in the granite, and vein *E* to the north of it, in the anorthosite. These three veins do not carry important values in gold or copper. Copper values are consistently present only in vein *A*.

Diamond drilling late in 1929 indicated the downward continuation of vein *A*. During the present winter (1936-37), further diamond drilling is being done and equipment for underground mining is being taken in to the property.

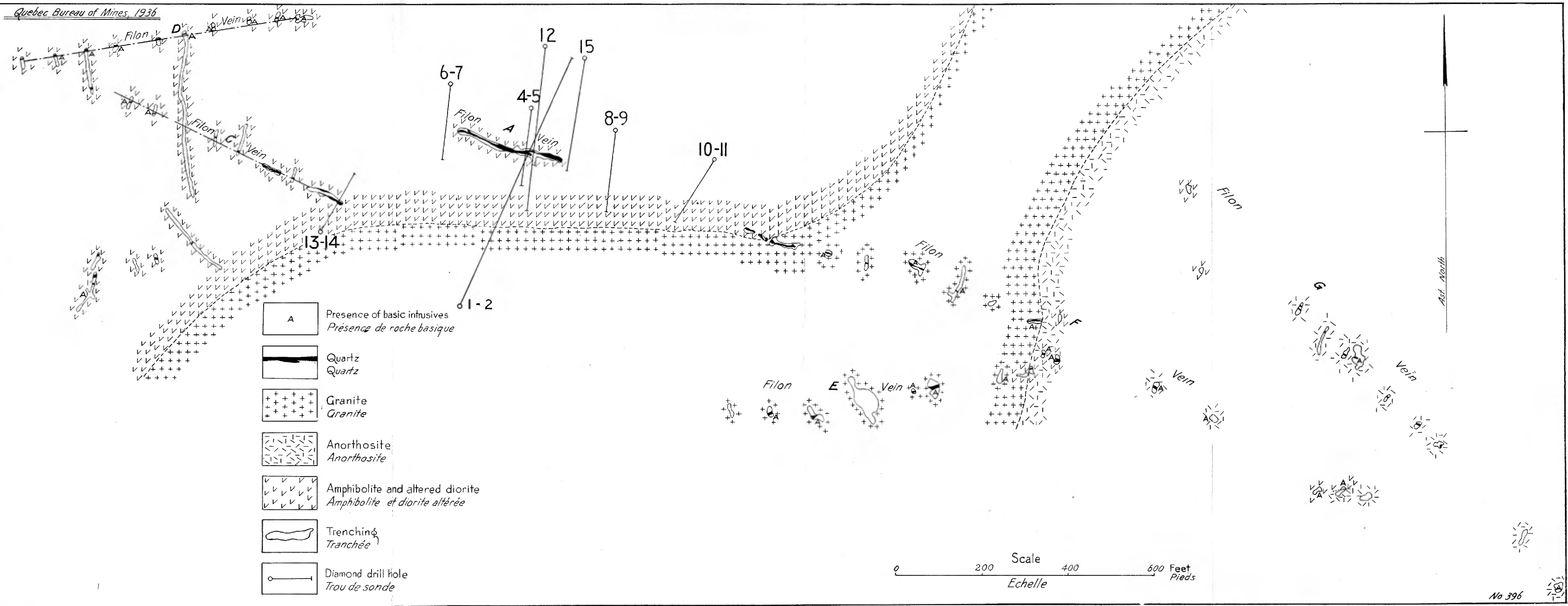
BLAKE CHIBOUGAMAU MINING CORPORATION

This Company holds blocks *A*, *B*, *C* and *D* of, respectively, 110, 7, 126, and 50 acres, in Obalski township, and block *B*, of 305 acres, in McKenzie township. Block *C* is at the north end of Merrill island, in Doré lake. Surface work here on a northwest-trending mineralized shear-zone in altered anorthosite has been described by Retty ① and by Mawdsley and Norman ②. During the winter of 1935-36, the Consolidated Mining and Smelting Company of Canada, Limited, put down twenty-six diamond-drill holes on the island. This drilling indicates that the shear-zone extends for some 2,000 feet southeast from its most northwesterly exposure at the margin of the island. Mineralization is also indicated 300 to 500 feet north of the southeastern part of the zone over a length of 500 feet in six holes. The mineralization intersected in this latter zone, and in the main northwest zone, is similar to that on the surface, *i.e.*, chalcopyrite, pyrrhotite, and pyrite, in shattered altered anorthosite, with some quartz present. Assay plans of the drilling, submitted by the Company, show mineralization in all the holes except the most southeasterly one. The one or more horizontal widths of mineralization cut in the holes are nearly all greater than 10 feet, and in two there are widths around 60 feet. Gold values over these widths are less than 0.1 ounce per ton and mostly less than 0.05 ounce; copper, however, is consistently present and ranges as high as 5.04 per cent over a horizontal width of 23 feet, though usually between 1 and 2 per cent for greater widths and for most of the lesser widths.

The water claims northwest of the island are held by Consolidated Chibougamau Goldfields, Limited. In the winter of 1934-35, this Company drilled twelve holes along the strike of the main northwest zone occurring on the island. The holes are within 800 feet of the island, on claims Nos. Q.2469, 2452, and 2471. They show the mineralization to persist strongly for some 500 feet northwestward from the island, beyond which it becomes less intense. The position of the intersections suggests that here the zone deviates some degrees towards an east-west strike from the general north-

① Que. Bur. Mines, Ann. Rept., Pt. D, 1929, p. 64.

② Geol. Surv. Can., Mem. 185, 1935, pp. 74-76.



- A Presence of basic intrusives
Présence de roche basique
- Quartz
Quartz
- Granite
Granite
- Anorthosite
Anorthosite
- Amphibolite and altered diorite
Amphibolite et diorite altérée
- Trenching
Tranchée
- Diamond drill hole
Trou de sonde

Scale
0 200 400 600 Feet
Echelle Pieds



MAP No. 396.—Surface plan of Obalski Mining Corporation, Caché Bay property, Chibougamau district.

(After J. E. Bill, R. W. Howe et L. Germain)

west trend on the island. This change in strike is also suggested by the direction of some of the shear-planes in the trench on the island nearest to the water's edge. Some of the holes showed continuous mineralization over horizontal widths up to 31 feet, and more scattered mineralization over widths up to 70 feet. Good copper and gold values are present over horizontal widths up to 10 feet in the five holes within 200 feet of the island, and over narrower widths in the holes farther northwest.

Thus the mineralized zone, including the portion on Merrill island and that extending out under the lake, has a length of some 2,500 feet. It would average low, but appreciable, copper values, and low gold values, over considerable widths. The drilling results also suggest the possibility of some sections carrying consistent commercial gold values.

CHIBOUGAMAU PROPERTIES, LIMITED

This Company did exploratory trenching on a group of seven claims, Nos. Q.18663 to 18669, on Cachée lake, as well as general prospecting on several other groups of claims in the district.

ROY TOWNSHIP

WAWBANO MINES, LIMITED

This Company has optioned Portage island, lying between the north ends of Chibougamau and Doré lakes, from the Obalski Mining Corporation, who hold it under a Mining Concession. Showings on the island discovered prior to 1936 have been described in the report of the Chibougamau Mining Commission, and by Mawdsley and Norman ^①. At the time the writer visited the property in July, 1936, a geophysical survey of the island was being made under the direction of Dr. Hans Lundberg. The Company was also engaged in exploring, by diamond drilling, the quartz showings in the old workings known as the 'McKenzie gold mine' ^②, where the Consolidated Mining and Smelting Company of Canada had put down eighteen diamond-drill holes in the summer of 1935. The old trenches and pits on the showing were being cleaned out and extended, and new ones were being made (Map No. 397). Results of the surface sampling, as reported by the Company, indicate—as had the earlier sampling—that the gold values are erratically distributed throughout the quartz. Some channel samples, two to five feet in width, have yielded over an ounce in gold per ton, while others nearby carry little or no gold.

Holes drilled down the dip of the vein, or across it, at shallow depths show gold values as erratic as on the surface. Nine holes drilled from the south to intersect the zone at a depth of 120 to 200 feet over a length of

^① Geol. Surv. Can., Mem. 185, 1935, pp. 86-88.

^② Chibougamau Mining Commission, Report on the Geology and Mineral Resources of the Chibougamau Region, Quebec; Mines Branch, Dept. of Coloniz'n, Mines and Fisheries, Quebec, 1911, pp. 193-203.

700 feet along the strike did not yield encouraging results, although some of the intersections carried low gold values and one as high as \$7.70 over a two-foot width. Farther south, and east of the eastern limit of the surface exposures, four holes spaced over a length of 200 feet were drilled to vertical depths of around 400 feet. None of these disclosed important values, although some low-gold intersections were obtained. The writer is not familiar with the nature of the material in which the values occur. The Company is further exploring the zone by underground mining during the present winter (1936-37).

Exploration by trenching was carried on at other points on the island during the summer of 1936.

CONSOLIDATED CHIBOUGAMAU GOLDFIELDS, LIMITED

This Company holds a group of forty-nine claims, Q.14559 to 14607, at Bear bay, Chibougamau lake, and east of Portage island. These claims are to the east and west of a group of seven claims held by Noranda Mines, Limited, on which is an extensive east-west zone of sulphide mineralization ①. This zone was explored by surface trenching and diamond drilling by Dome Mines, Limited, in 1929-30, and by further trenching by Noranda Mines in 1934. The zone extends eastward on to the claims held by Consolidated Chibougamau Goldfields and has been explored by the latter Company in trenches on claim Q.14566 and on the boundary between claims Q.14561 and 14562. They report that sampling of the mineralization yielded only negligible values in gold and silver and mostly very low values in copper, the highest being 0.84 per cent.

In the summer of 1935, the Company also drilled two holes from Copper point, on Portage island, under their water claim, Q.14601, to explore some irregular surface showings of chalcopyrite ②. Some gold and copper-bearing mineralization was intersected and the Company intends to do further drilling in the vicinity.

SCOTT TOWNSHIP

O'LEARY-MALARTIC MINES, LIMITED

RAMSAY OPTION:

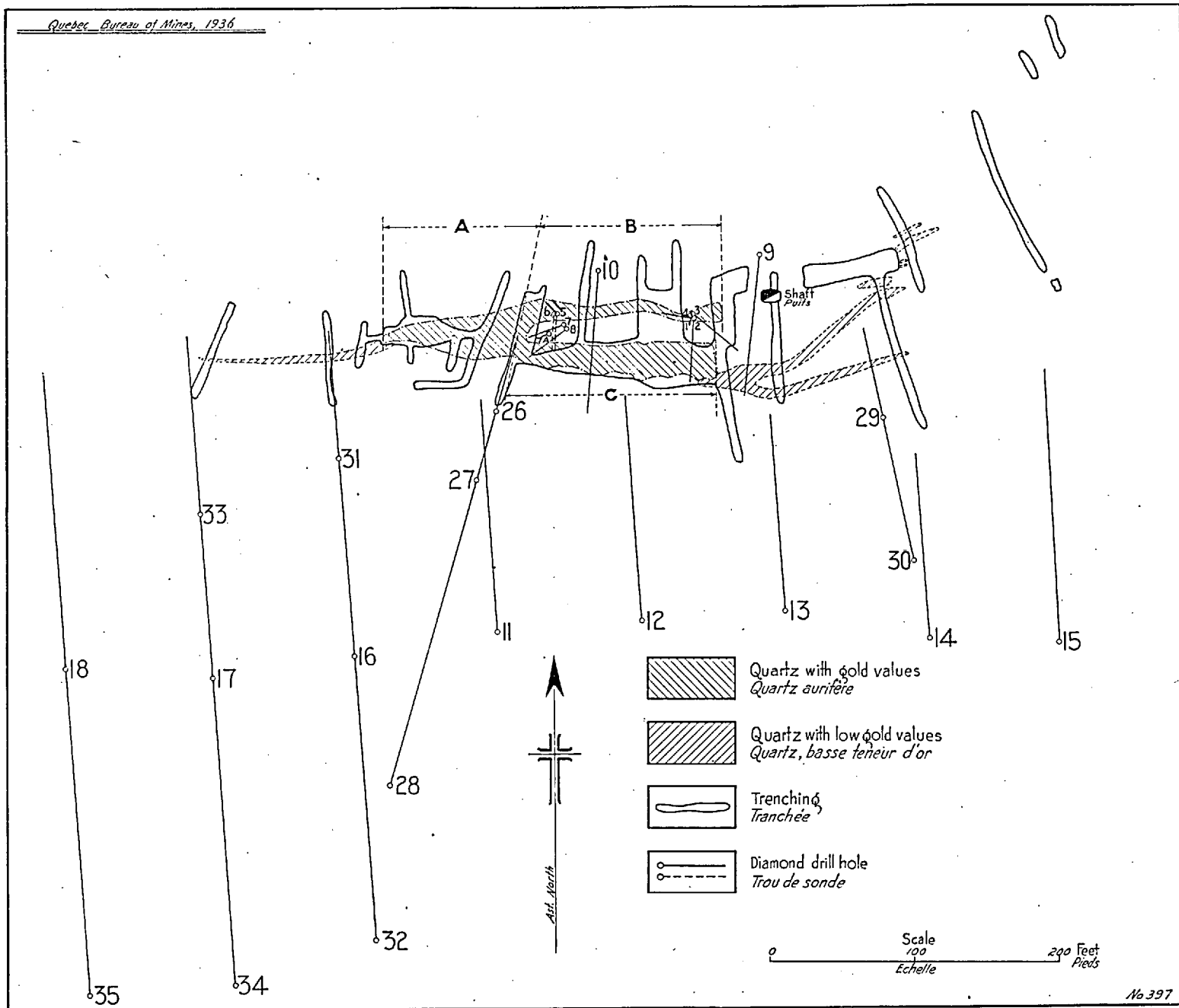
This property is north of David lake. It includes twelve claims, Nos. Q.17051 to 17056 and 17414 to 17419.

Much drift and rock trenching has been done on several mineralized zones on the property. These are in granite just north of its contact with diorite. Irregular dykes of aplite and quartz porphyry intrude the granite and all of these rocks are cut by dykes of 'greenstone'.

The most important zone on the property is about 800 feet north of the lake. Here, mineralization occurs fairly continuously along a fractured zone for a distance of 450 feet, and over widths up to five feet. The zone has a direction N.71°W. and dips to the north at 60 to 75 degrees. The

① Geol. Surv. Can., Mem 185, 1935, pp. 88-89.

② Geol. Surv. Can., Mem 185, 1935, p. 87.



(Modified after T. G. Woodcock)

MAP No. 397.—Plan of quartz veins and diamond drill holes of Wawbano Mines, Limited property, Portage island, Chibougamau district.

fractured zone in part parallels, but also crosses, a dyke of greenstone. The mineralization consists of pyrite and chalcopyrite occupying fractures, and also disseminated, in the altered granite and other rocks. Only a little quartz is present. The Company reports commercial values in gold at the surface along the eastern 260 feet of the zone over an average width of four feet. The zone has been explored in five diamond-drill holes, averaging 200 feet in length. No mineralization carrying gold values was intersected in four of the holes under the portion of the zone exposed at the surface. In the fifth hole, drilled in muskeg 100 feet east of the most easterly surface exposure, 47 inches of heavy sulphides, chiefly pyrite, were intersected. On sampling, this material was found to carry \$10.85 in gold per ton (gold at \$35.00 an ounce).

Other, smaller zones, carrying lower values, occur within a few hundred feet north, south, and west of the above (main) zone. Most of these resemble the latter, but some have a more nearly east-west trend and the mineralization, though present over good widths in places, is not persistent along the strike for any great lengths. One of these minor zones consists of pyrite mineralization in and near a narrow quartz vein which parallels a dyke of greenstone. To the west of the main zone, a sheared greenstone dyke, striking N.70°E., is displaced six feet to the north along the west side of a fault striking N.21°W. Thirty feet south of this point, the fault-plane is occupied by a quartz vein which continues for about 50 feet farther south. It is less than nine inches wide and is almost unmineralized, except for a little pyrite. Some black tourmaline and yellowish carbonate are associated with the quartz in some of the mineralized zones.

MCKAY (QUEBEC) EXPLORATION, LIMITED

Since the summer of 1934 this Company has carried on exploration work on several large groups of claims in Scott township. Two of the properties on which discoveries have been made, the Duchesne Island claims and the Smith claims, were taken over by Scott Chibougamau Mines, Limited, late in 1936.

DUCHESNE ISLAND GROUP:

This group of fifty-six claims, Nos. Q.17429 to 17468 and 17680 to 17695, covers the northern part of Simon lake. The main showing is at the northern end of Duchesne island, the largest island in the lake, and is about 300 feet south of the No. 1 post of claim Q.17441.

The rocks in the vicinity of the showing are altered diorite and quartz diorite intruded by irregular, mostly fine-grained, dykes and masses of granite. Trenching over a north and south distance of 700 feet or so has disclosed quartz veins within the northern 500 feet of this length. All the veins vary in width along their length and some of the quartz is in irregular patches rather than in distinct veins. In the central 200 feet of the vein-zone there are several fairly persistent, successive and parallel veins, some of them joined by branches of quartz. In places, nearly 50 per cent of the rock over widths up to twenty feet consists of quartz, in parallel veins from a few inches to three feet wide; but in other places only narrow stringers of

quartz occur. At the north end of the trenching, at the lake shore, there is a vein or mass of quartz, ten feet wide in an east-west direction, which narrows to a few small stringers within fifteen feet or so both to the north and to the south. About twenty-five feet to the southeast of this vein, another vein, one foot to four feet wide, has a length of fifty feet. Its direction varies from southeast to nearly northeast. The veins along the main north-south zone usually trend from north to nearly northeast. Most of them dip about 45 degrees to the west.

The quartz of the veins is white, and glassy in appearance. It contains large crystals of yellow carbonate and some tourmaline. Much of it appears barren, but locally it is heavily mineralized with pyrite, often in coarse cubes. Some mineralization is seen also in the altered diorite.

Diamond drilling in eight holes has indicated downward continuation of the quartz in the central part of the zone and in the northern end of it, as well as some quartz not apparent on the surface. The Company reports that free gold has been observed in the quartz, and that gold values have been obtained from assays of the quartz and mineralized wall-rock; but exploration to date has not revealed any persistent ore-zones. Further work is to be done on the property.

SMITH CLAIMS:

This group consists of ten claims, Nos. Q.18243 to 18252, at Buckell lake, southwest of David lake. A discovery of quartz and oxidized material carrying spectacular free gold was made on the property during the summer of 1936. The showing lies 150 feet west of the Chibougamau river, along the boundary between claims 18244 and 18247.

The discovery was examined by the writer shortly after it was made, when little work had been done on it. All that could be seen was a small lens of quartz overlain by a heavy gossan of iron oxides in which there was an abundance of free gold. The quartz is well-mineralized with pyrite and also contains needles of green actinolite. Some pyrite is present in the wall-rocks. The lens occurs along a north-south fractured zone at the contact of anorthosite on the east with diorite (intruded by a fine-grained porphyritic facies of the local granite) on the west. Results of subsequent work on the showing up to October, 1936, have been furnished by the Company in a report by P. M. Malouf, who was in charge of operations. This work consists of trenching, stripping, and 583 feet of diamond drilling in six holes. The fracture along which the quartz occurs has been shown to be a fault-plane dipping 45 to 65 degrees to the west. It has been traced for 300 feet. The high-grade quartz lens has been found to be twenty feet in length near the surface. It is overlain by as much as eight feet of gossan. The quartz has a width of twelve inches at the top of a prospect shaft sunk at the north end of the lens, and a width of thirty inches at the bottom of the shaft, 13 feet below the surface. Free gold has been seen in the freshly exposed quartz. This quartz, as well as the oxidized material, has yielded very high gold assays. Quartz and carbonate, with some pyrite, also occur along veins striking northeast and northwest, but these veins have not as yet been found to carry commercial values in gold.

DAVID LAKE GROUP:

This group includes forty-one claims lying northeast of David lake. Twenty-nine of the claims, Nos. Q.17489 to 17517, are in Scott township, and twelve, Nos. Q.17518 to 17529, are in the adjoining part of Obalski township.

Some six showings had been found on the property at the time of the writer's visit in July, 1936. Four of these had been explored by one or more diamond-drill holes. The Company reports that none of the mineralized zones were found to carry important values over significant lengths or widths. Most of the showings consist of quartz-carbonate-pyrite mineralization in slightly sheared or fractured zones in diorite and gabbro intruded by granitic rocks and later dykes of greenstone. One of the showings is a quartz-tourmaline vein with considerable sphalerite in places.

WILLIAM LAKE GROUP:

This group lies around and east of William lake, in the northeast corner of Scott township. Included in the group are claims Nos. Q.17469 to 17488. Work has been concentrated on a showing near the south shore of the lake, just below water level. The Company reports that six holes drilled during the winter of 1935-36 showed quartz-chalcopryrite-pyrite mineralization, with associated siderite, over narrow widths in a sheared zone in altered volcanics. Assays of the mineralized material yielded some good copper values, but only low gold. The property was not visited by the writer.

MALOUF SHOWING:

This showing is on one of a group of thirty claims, Nos. Q.18061 to 18085 and 18283 to 18297, lying between Simon and Scott lakes. It is on the north bank of the Chibougamau river, just opposite the end of the portage at the outlet of Simon lake. At this point a quartz vein, with a direction N.43°W., is exposed for about 55 feet. Its southeastward continuation is obscured by drift and water, and at its northwestern extremity it pinches out in the granite wall-rocks. The vein dips 35° to 45° southwest. For most of its length, the hanging-wall is not exposed. The horizontal width of the quartz, as exposed, is from a few inches to seven feet. The quartz is finely crystalline. Much of it is heavily mineralized with fine-grained pyrite in bands, and with disseminated pyrite, sphalerite, chalcopryrite, and galena. There is also some disseminated mineralization in the footwall. The Company reports the average assay of the well-mineralized quartz as follows: silver, trace; lead, 0.72 per cent; zinc, 5.62 per cent; copper, 1.46 per cent; gold, 0.91 ounce per ton. In three holes drilled below and to the southeast of the surface exposure of the vein, no indications of its continuation were found.

SCOTT LAKE GROUP:

Some mineralization has been found at four points in a group of forty claims, Nos. Q.17696 to 17735, at the southwest end of Scott lake. One is an east-west shear-zone in rhyolite and other volcanics which has been traced for half a mile. It is mineralized with sulphides over widths up to

forty feet, but assays of the material yielded only low gold values, according to the Company's representatives in the field. The other showings are short, and mostly narrow, quartz-sulphide zones which also are reported not to carry important gold or copper values.

RYAN CLAIMS

J. Ryan did a considerable amount of exploratory trenching on a group of claims at the northwest corner of David lake. Some mineralization was uncovered in granite adjacent to a greenstone dyke about 200 feet south of the northeast corner of claim Q.17871. However, Mr. Ryan reports that no important gold values were obtained in samples taken across the zone.

CHIBMAC MINES, LIMITED

This Company holds a group of fifteen claims, Nos. Q.20280 to 20294, lying between Simon and Dulieux lakes. At the time of the writer's visit to the property in August, 1936, exploratory trenching was being carried on over a northeast-trending ridge which crosses the middle part of the boundary between claims 20280 and 20294. The rocks here are altered diorite intruded by quartz diorite and granite. On the north side of the ridge, a quartz vein, striking northeast, is exposed fairly continuously for 100 feet. Within this length the width of the vein varies from one to six inches. The quartz is well mineralized with pyrite, and this mineral also occurs in the walls. About 150 feet to the northeast, in the general strike of the above vein, another vein of similar character is exposed for a few feet. Cutting across it is an irregular vein of different character which consists of white, glassy quartz containing patches of yellow carbonate and some tourmaline. The latter mineral tends to occur in bands at the margins of the vein. This cross-cutting vein is almost unmineralized except for a little pyrite associated with the tourmaline. Where it crosses the northeast vein it is several feet wide, but it appears to narrow to the northwest and southeast, although it is partly obscured in these directions by drift. At points 100, 200, and 300 feet southeast of this vein, several sheared zones have been partly uncovered. Veinlets and lenses of quartz occur along these and in places there is a fairly heavy mineralization, though no persistent mineralized zones had been traced out as yet. Complete results of sampling are not available, but the Company reports that preliminary sampling on some of the veins and sheared zones has not indicated commercial values in gold.

OTHER PROPERTIES IN SCOTT TOWNSHIP

P. G. McKenzie holds two groups of claims, one adjoining the Chibmac property on the south and one lying to the north, across Dulieux lake. Trenching and stripping were observed at two places on the claims, and at two points quartz-carbonate and quartz-tourmaline veins were seen. They are not heavily mineralized, though some pyrite is present.

Rubec Mines, Limited, hold a group of thirty-two claims, Nos. Q.19648 to 19679, lying between Scott and Simon lakes. At the time of the writer's visit to the property, four discoveries had been made. They consist of

quartz-pyrite mineralization along sheared zones in altered diorite intruded by granite. The showings were not completely exposed at the time but, so far as could be observed, none of them appeared very large.

G. Fleury holds three claims, Nos. Q.15275-77, in the northeast corner of the township. On claim 15277, there is a zone of fairly heavy sphalerite mineralization, as described by Mawdsley and Norman ①. Mr. Fleury was doing further stripping and trenching on the showing at the time of the writer's visit to the property in July, 1936.

In the summer of 1935 a small quartz vein, carrying good values in gold, was found by the Ceres Exploration Company, Limited, on a small island in the central part of Simon lake. A narrow zone of quartz-pyrite-sphalerite mineralization, carrying gold values, was found at about the same time by the Noranda Mines, Limited, on an island at the south end of the lake. Neither showing appears sufficiently extensive to be of commercial importance, although it should be noted that the last mentioned is but little exposed. No further work was done on either of them during the summer of 1936.

BARLOW TOWNSHIP

RANGELY CLAIMS.

McKay (Quebec) Exploration, Limited, optioned a group of fifteen claims, Nos. Q.16360 to 16364, 18703 to 18707, and 18817 to 18821, from W. Rangely during the summer of 1936. The claims are north of Gwillim lake, adjoining the Rangely-Wolson property, in McKenzie township, on the east.

In three trenches in the southeast corner of claim 16362, 1,500 feet north of the lake, a large quartz vein up to ten feet wide is exposed over an east-west distance of 160 feet. The quartz is barren except for a little pyrite around chloritic inclusions. Pyrite also occurs in the wall-rock which is schisted and carbonated volcanics. Diamond drilling showed downward continuation of the quartz vein, but the intersections gave no gold values. Assays of grab samples from the surface exposures yielded up to \$6.40 in gold per ton.

CROTEAU SHOWING

This property lies south of the Chibougamau river, between Big Rush lake and Little Rush lake. It was discovered by the Croteau brothers, of Senneterre, in the late summer of 1935. No one was working on the property at the time the writer visited it, in August, 1936, and it is not certain that all the discoveries on the claims were observed.

Four trenches have been opened at intervals along an east-west mineralized zone which crosses the middle part of the boundary between claims Q.17397 and 17404. The rocks along the zone are highly sheared and carbonated and difficult to identify. They are probably altered volcanics of intermediate composition, with perhaps some intrusive acid porphyry. One hundred feet north and the same distance south of the zone, more massive dioritic rock with phenocrysts of hornblende is exposed.

① Geol. Surv. Can., Mem. 185, 1935, pp. 69-70.

In the most easterly trench, two irregular quartz veins or lenses up to 1.5 feet wide are exposed. One of these dips 75 degrees to the north and the other flatly to the south. In places, the quartz and adjacent wall-rock are heavily mineralized with coarse and fine pyrite. Other narrow veinlets of quartz and some pyrite occur in the sheared rock to the north and south of the larger quartz lenses. In the next trench, 100 feet west of the above, a width of 7.5 feet of quartz is exposed, and the rock for 2.5 feet on its northern side consists of quartz, and schist and carbonate, in about equal amounts. The main vein dips 60 degrees to the north. Near the hanging-wall, both the quartz and the adjacent quartz-carbonate-schist complex are heavily mineralized with pyrite, mostly coarse. The sheared rock away from the vein contains disseminated pyrite as well as some specularite, associated with quartz. Specularite was seen also in the other trenches. In the third trench, 100 feet farther west, rusty sheared rock is exposed over a width of 40 feet. Traversing it are some stringers of quartz and pyrite. In the fourth, most westerly, trench, 120 feet distant from the last, some twenty feet of rusty, carbonated schist is exposed.

Results of assays are not known to the writer, but it is reported that some gold values were obtained from assays of the heavily mineralized material in the zone. Further work is at present being done on the property by Chibmac Mines, Limited, who optioned the ground in the fall of 1936.

LEVY TOWNSHIP

OPEMISKA COPPER MINES, LIMITED

Results of surface work and diamond drilling on this property, up to the fall of 1934, have been given in an earlier report ①.

Since 1934, a winter road to the property has been constructed from Rouleau Siding, on the Quebec-Cochrane branch of the Canadian National railways. In March, 1936, shaft-sinking was commenced to explore the four main mineralized zones on the property. The following account of underground development is based on observations by the writer during a visit to the property in August, 1936, and on an interim progress report of the Company dated November 10th. Values given are those reported by the Company.

The shaft is between the North zone and the No. 1 zone, about 130 feet north of the eastern end of the former. It has a depth of 300 feet, and 2,500 feet of cross-cutting and drifting have been done on two levels, at 150 feet and 275 feet.

The North zone has been cut on the 150-foot level, but not developed. At the intersection, there is a width of three feet of ore estimated to carry 6 per cent copper. On the 275-foot level, a vein, one to two feet wide, believed to be the North vein, was intersected. It was not found to carry commercial values and did not continue eastward as expected.

The No. 1 zone was cut on the 150-foot level, but not developed. The intersection shows five feet of ore containing 2 per cent copper and \$6.00 in gold per ton. At the 275-foot level, the zone has been developed for 750

① Que. Bur. Mines, Ann. Rept., Pt. A, 1934, pp. 141-145.

feet. Where first intersected in the cross-cut, the ore-zone is two feet wide but values are not commercial. To the west of the cross-cut there is an ore-shoot, 35 feet long by 4 feet wide, carrying 6 per cent copper and \$2.00 in gold per ton. The shoot is interrupted by a fault, but drifting was continued westward to the gabbro-rhyolite contact and a shoot 160 feet long with an average width of 4 feet was picked up. Assay results for this shoot are not available, but the Company estimates the average values to be 6 per cent copper and \$2.00 in gold per ton. East of the cross-cut, 100 feet of ore was found, carrying 11 per cent copper over an average width of six feet. This shoot also terminated in a fault. Drifting was continued for 200 feet east of the fault without any further ore being developed. Diamond drilling is now under way to determine whether or not there is an extension of the ore-zone north or south of the drift.

Cross-cutting on the 150-foot level has not yet been extended as far south as the No. 2 zone. This zone was cut on the 275-foot level. The intersection shows seven feet of ore estimated to carry 12 per cent copper. The vein has been drifted on for 160 feet east and west of the cross-cut. Though the central portion carries satisfactory values over good widths, the vein narrows to between two and three feet toward both the east and west, and the grade drops to about 5 per cent copper. The zone will be explored farther east and west by diamond drilling from the workings on the No. 1 zone.

Underground workings have not extended as far south as the No. 3 zone. It will be explored by diamond drilling from the No. 2 zone workings.

At the time of the writer's visit, the arsenopyrite-gold mineralization which occurs along a northwest-southeast fault at the surface had not been recognized underground. No mention of it is made in the Company's interim report.

Since 1934, an additional diamond-drill hole has been put down at 45 degrees in a northwesterly direction from the central part of the No. 1 zone. This hole confirms what had been indicated in the earlier drilling and by the more recent underground work, that the gabbro-rhyolite contact is dipping southeastward. An interesting feature of the hole was the intersection of 24.2 feet of mineralization in the gabbro just before the contact was reached. This mineralization carries 5.19 per cent copper, and \$0.26 in gold and 0.30 ounce silver per ton.

A new discovery was made on the property during the summer of 1935. This is known as the Perry showing. It is in the south part of claim Q.7591, about half a mile east, and somewhat north, of the main showings. It consists of quartz-chalcopyrite-pyrite mineralization along a north-south sheared zone in pyroxenite. The zone has been explored in nine surface trenches and ten diamond-drill holes over a length of 400 feet. The surface trenches were mostly filled with water at the time of the writer's visit to the property. The Company reports that in one trench mineralization was exposed over a width of 13 feet, estimated to carry 17 per cent copper. Lesser widths occur in the trenches to the south, and in the most southerly ones there is but little chalcopyrite. Heavy drift prevented complete surface exploration of the zone, especially to the north. Six of the diamond-drill holes intersect the zone at intervals of 50 feet within a north-south dis-

tance of 250 feet, at vertical depths of 60 to 90 feet. In the central two holes, the mineralization intersected has a width of ten feet or more and carries 10 per cent or so of copper, but in the holes to east and west of these the copper values drop to less than one per cent. Three other holes cut the zone at depths of 110 to 200 feet. Two of these are under the southern part of the 250-foot section already referred to. These holes intersected mineralization at intervals over a total width of nearly sixty feet, within which are individual intersections of five feet and more carrying up to 5 per cent copper. The third hole is 70 feet south of the most southerly of the shallower holes and in two places showed mineralization over widths of two feet and less carrying up to 9.72 per cent copper. Two of these deeper holes also showed mineralization some 80 feet to the west of the main zone. This is heavy in the central hole, but slight in the hole to the south.

OPEMISKA MINES, LIMITED

This Company was doing surface exploration during the summer of 1936 on a group of claims at Laura lake. Late in the season, a geophysical survey of the property was made under the direction of Dr. Hans Lundberg. The Company reports that trenching over one of the favourable zones indicated by this survey has disclosed sulphide mineralization over a width of thirty feet. Preliminary samples show some copper, and low gold and silver values.

OPEMISCA TOWNSHIP

CONSOLIDATED MINING AND SMELTING COMPANY OF CANADA, LIMITED

This Company carried on surface exploration on a group of fifty claims, Nos. Q.15030 to 15052, and 15995 to 16021, at Gladstone falls on the Chibougamau river, at the outlet of Mikawasach lake. The claims were optioned from R. F. Gilman and A. H. MacKay. In 1935, a showing, discovered in the fall of 1934, was diamond drilled. This consists of sulphide mineralization, mostly pyrite with a little chalcopyrite, along a sheared zone at the contact of siliceous sediments and altered volcanics. The Company reports only low gold and copper values. No important mineralized zones were found by prospecting generally over the claims during the summer of 1936.

CUVIER TOWNSHIP

NORLAKE MINING CORPORATION

In September, 1936, a gold-bearing quartz vein was discovered on the Opemisca river, which drains south into the western part of Opemisca lake. The showing is about two miles north of the lake, in the central part of the LeClerc group of fifteen claims, Nos. Q.21738 to 21752, held by the above Company. It was not examined by the writer, as the discovery was made after his departure from the area. The Company reports that the vein has been traced on the surface for 400 feet, and that the quartz carries free gold and has yielded high gold values from assays of grab samples.

FATHER LAKE AREA

Early in the season of 1936 there was very active staking in the country north of Father lake, almost all of which was done in township 419. The 'rush' was occasioned by the discovery of gold-bearing mineralization on claims staked by R. L. Parker and Olaf Breive in the fall of 1935. Some work was done on the various claims early in the summer. A number of showings carrying gold were reported, but none of commercial dimensions, and no further work was done in the vicinity during the remainder of the season.

Four showings were seen by the writer. These are all within two miles northeast of the bend of the Opawica river where it turns west after leaving Doda lake, north of Father lake. They may be reached from the 'bend' or from a trail going north for four miles from the northwest extremity of Doda lake. The general geology of the area has been mapped by the Geological Survey of Canada ①.

The main work has been done on a showing in claim Q.17673, within 100 feet of the southwest corner-post of the claim. A sheared zone in altered basic volcanics is exposed for some 55 feet along a strike of N.4°E. This north-south shearing is intersected towards its southern extremity by a zone striking N.35°W. Some lenses up to one foot in width, as well as narrow stringers, of quartz occur along the zone over widths up to eight feet. In places, the quartz and sheared rock are well-mineralized with pyrite and chalcopyrite. The mineralization and the shearing diminish in intensity toward the north and south extremities of the zone.

In the southeast corner of claim Q.18044 is a vein 35 feet long and up to 1½ feet wide, striking N.12°E. Near its south end, another vein, 15 feet long and one foot wide, strikes N.45°E. Both occur in a fine-grained greenstone. The quartz is mostly white and barren, but in places it contains a little pyrite and chalcopyrite.

In the northwest corner of claim Q.16735 some work has been done on a carbonated, sheared zone, up to 30 feet wide, in volcanic breccia and fine-grained, greyish schist. The strike is N.50°W. Only a very little pyrite occurs along the zone. Fifty feet north is a 30-foot vein of barren quartz, striking east-west and dipping 55 degrees to the north. Five hundred feet south of the first-mentioned zone, another sheared zone up to three feet wide, in greenstone, has been traced for sixty feet. It strikes N.50°W. and dips 68° to the northeast. Some granitic material is present along the zone and there is much pyrite disseminated in both the sheared and massive rocks.

OPAWICA AREA

In 1929, a discovery was made by Prospectors Airways on the large island in the northern part of Opawica lake. The Company did some work on the showing in the summers of 1932-33-34. In 1935, the claims were acquired by the Ceres Exploration Company, Limited, who further explored them.

① Norman, G. W. H., *Opawica-Chibougamau Map-Area*; Geol. Surv. Can., Prelim. Rept., 1936.

The main showing is reached by a trail which, starting from a point on the west side of the island, 250 feet south of survey tag No. 1036, runs eastward for 850 feet. It is in claim Q.63490, about 150 feet northwest of the southeast corner-post.

The mineralization occurs over a length of nearly 100 feet in a direction N.17°E. It has irregular boundaries but in places extends across widths of 10 to 15 feet. It occurs in a massive, heavily jointed and fractured, dioritic rock, which is silicified and cut by narrow stringers of quartz with associated red feldspathic material, partially developed by replacement. In the vicinity are small, irregular, injections of red syenite. The mineralization consists mainly of pyrite accompanied by some chalcopyrite and a little galena and specularite. Some gold values have been reported.

Five hundred feet east of the above, less extensive mineralization is partially exposed in two trenches, twenty feet apart. Seven hundred feet to the southeast, a considerable amount of trenching has been done but only some small and little-mineralized quartz veins and shattered silicified zones in gabbro and diorite are to be seen.

During 1936 there were a number of prospectors in the area, especially after mid-summer, when a gold discovery was made by the Ceres Exploration Company. The discovery is about 800 feet north of the northwest bay of McDougall lake, a small lake about two miles west of the northern part of Opawica lake. The lake can be reached by a well-cut portage, 97 chains in length, leading north from the middle part of the long west arm of the northern part of Opawica lake. The showing consists of white quartz occurring along intersecting fractures in massive gabbro. The fractures strike N.80°E. and N.12°E., and those with the former strike appear to be faulted along the latter direction. The quartz occurs over a length of 30 feet in a general direction N.60°E., zig-zagging along the two sets of fractures. It is not more than a few inches wide, but in at least one section of a few feet it is heavily speckled with free gold.

Prospecting was active in other parts of the Ceres property. At the close of the season, some pyritized quartz veins occurring along sheared zones in gabbro were being uncovered 900 feet north of the free-gold showing; and just north of the east end of McDougall lake, a carbonated zone was discovered which showed gold on panning.

Work was also being done in the vicinity by the Prospectors Airways Company, on a showing discovered by A. Elstone and W. Saunders. It is on the mainland, just west of the southern part of Opawica island. Here, in an irregular area of several square feet, hard, silicified rock and cherty quartz is mineralized with pyrite and some galena, and in places there is visible free gold. East from this point a more definite sheared zone had been traced for some hundred feet at the close of the season. It dips about 75 degrees to the north. The rock along the zone is soft, altered, chloritic schist, with occasional cherty patches and stringers of quartz. Carbonate, pyrite, and chalcopyrite occur in places. The shearing extends over widths up to 25 feet. Some mineralization has been found also to the west of the free gold showing, but the rock there is more massive and has been replaced or injected by fine-grained aplitic material to such an extent that it resembles a conglomerate.

Prospectors reported finding free gold elsewhere in the area, in narrow stringers of quartz in the red syenite. There is an evident close relationship between this red syenite and the gold mineralization.

PUSTICAMICA AREA

In the Pusticamica area, two groups of claims were being explored during the summer, and there was general prospecting elsewhere by several parties.

Thorne Explorations hold a group of forty-two claims along the south shore of Pusticamica lake, just east of the outlet of the O'Sullivan river. Much trenching has been done following the finding of several angular boulders of mineralized quartz and green schist, one of which contained some visible native gold, while three others yielded assays of 0.9, 0.4, and 0.26 ounce in gold per ton, as reported by the Company. The boulders were found in an area of heavy drift on a point on the south shore of the lake, at the entrance to the southwest bay. Trenching has not so far revealed bedrock material similar to the boulders. However, a wide mineralized zone has been uncovered over an east-west length of 200 feet, just to the east of survey tag No. 971. The mineralization consists of pyrite and a little chalcopyrite in a sheared, shattered, and kaolinized quartz porphyry and more massive dioritic rock, probably an altered volcanic. Small stringers of quartz traverse these rocks, both of which are characterized by bluish, opalescent eyes of quartz. The porphyry is probably related to the stock of massive red granite that forms the high hill to the south. The Company reports that assays of the material in place have not so far revealed gold values of more than \$1.20 per ton. Further exploration in the vicinity by diamond drilling is planned.

Dubuisson Mines, Limited, carried on prospecting over a group of claims south of the west end of the long northwest bay of Pusticamica lake. The Company reports that no encouraging mineralization was encountered on the claims.

CURRIE TOWNSHIP AREA

The Currie Township area was the scene of much prospecting, trenching, and diamond drilling during the summer of 1936. Some of the properties on which work was done, and the general geology of the area, have been described in an earlier report ^①.

LAKE ROSE MINES, LIMITED

Development work at this property on Rose lake was continued during 1936 ^②. On the tunnel level, the drift on the No. 1 vein was carried westward a distance of 490 feet. At 376 feet, a cross-cut was driven south for 390 feet to explore the ground west of the diorite intrusive, but it did not intersect important mineralization. A raise was carried through on the No. 2 vein from the tunnel level to the surface. The vein follows a

^① Que. Bur. Mines, Ann. Rept., Pt. B, 1935, pp. 81-108.

^② Que. Bur. Mines, Ann. Rept., Pt. B, 1935, pp. 101-103.

drag-fold over a total length of 200 feet. For this length, an average gold value of \$54.25 per ton over an average width of 2.25 feet is reported by the Company. A thirty-three foot raise on the No. 1 vein, which was still in ore when discontinued, showed an average gold value of \$8.40 per ton over an average width of two feet.

Since June, 1936, a winze has been sunk from the tunnel level to a depth of 266 feet. It is about 60 feet west of the tunnel and 30 feet north of drift No. 1. Two levels have been opened, respectively 125 feet and 250 feet below the tunnel, since the writer visited the property in October, 1936. The results of this work, up to early in April, 1937, as announced by the Company in their annual report, are disappointing. No. 1 vein was intersected 15 feet north of the shaft on the 125-foot level and was drifted on east and west for a total length of 337 feet. No. 2 vein was intersected 75 feet south of No. 1 and has been drifted on for 110 feet. It is being explored by a raise from the 125-foot level.

On the 250-foot level, two weak shears in which there is a little quartz are exposed along the probable downward extensions of the No. 1 and No. 2 veins. The main cross-cuts, extending 140 feet north and 50 feet south, do not expose anything of interest.

Diamond drilling in three holes preceded the mining below the tunnel level. In one of these, near the winze area, the No. 1 vein was intersected at a depth of 125 feet. The other two holes, 50 and 200 feet respectively east of the tunnel, did not intersect interesting mineralization. Four holes also explored the large quartz vein at the portal of the tunnel. Though wide intersections of quartz were encountered, these were not found to carry encouraging gold values. Further drilling is planned to intersect this vein at a depth of 250 feet and also to explore the ground south of the main workings.

NORANDA MINES, LIMITED

This Company carried on exploration over a group of fifteen claims, Nos. A.58333 to 58347, just northeast of Cameron lake. Some pyrite mineralization with a little quartz along northwestward-trending zones was trenched, but the Company reports that all assays of the material gave negligible gold values.

DUBUISSON MINES, LIMITED

This Company further explored a group of claims, Nos. A.54096 to 54120, southeast of Rose lake. The claims were formerly held by Messrs. Potter and Boulanger ①. No mineralization with important values was discovered.

DESJARDINS TOWNSHIP

FLORENCE RIVER (QUEBEC) GOLD MINES, LIMITED

This Company continued exploration on their group of forty-five claims lying between Cameron lake and the Florence river and extending north from the southern boundary of the township ②. Since the fall

① Que. Bur. Mines, Ann. Rept., Pt. B, 1935, pp. 104-105.

② Que. Bur. Mines, Ann. Rept., Pt. B, 1935, pp. 107-108.

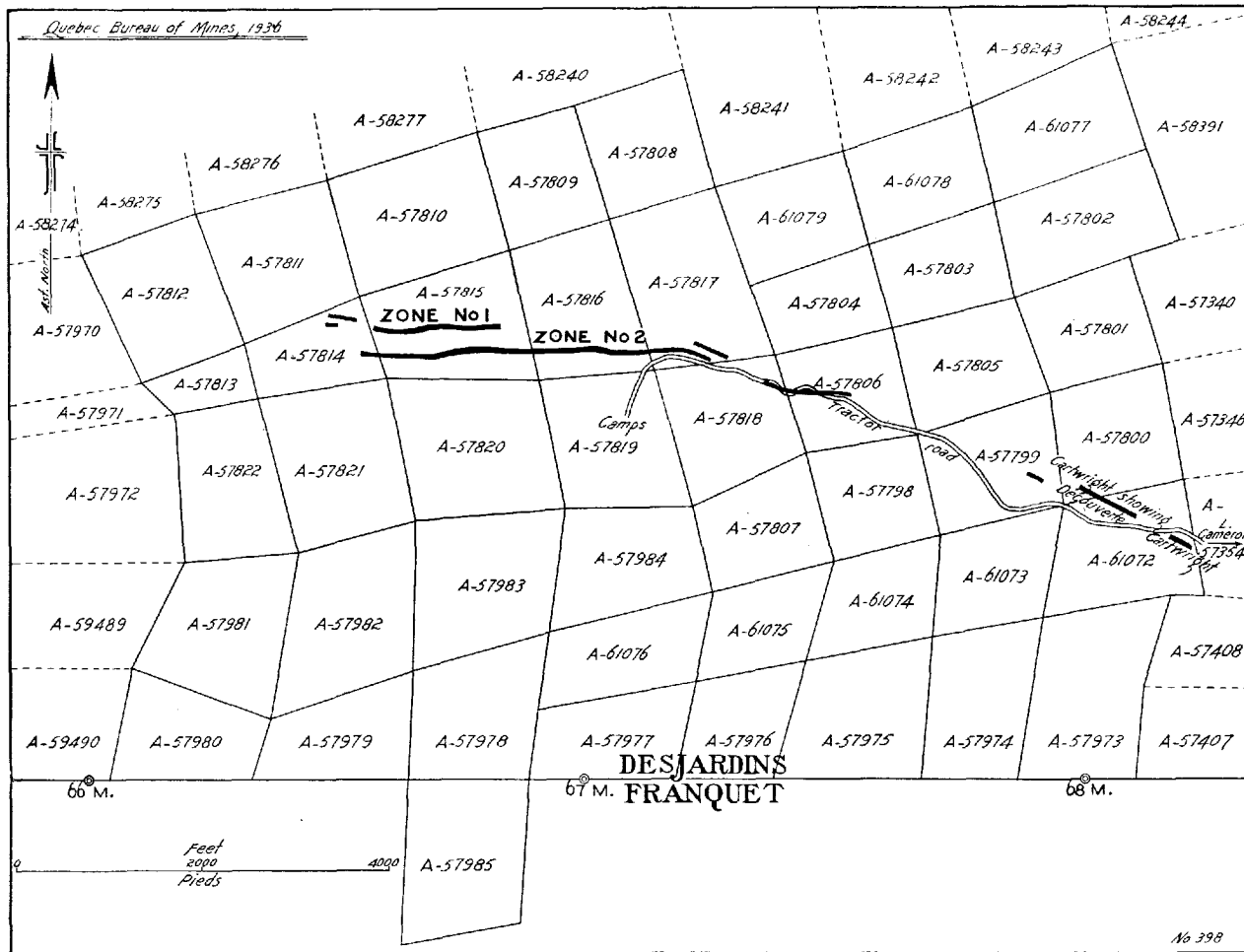


FIGURE 5.—Florence River (Quebec) Gold Mines property, showing the principal vein systems.

of 1935, a camp of fourteen buildings has been erected on the property, from which a tractor road, with telephone line, leads to Cameron lake, $3\frac{1}{2}$ miles to the east. Four miles of surface trenching, and 16,000 feet of diamond drilling in 100 holes, have been done on the property.

This work has shown the No. 1 vein-zone (Figure 5) to persist for nearly 2,000 feet, within which distance are three ore-shoots with a combined length of 1,367 feet and an average width of two feet. Along the No. 2 zone, quartz is present almost continuously from the western end for about 4,000 feet east to the point where the general zone of shearing swings southeast. About 100 feet north of this point, a parallel vein has been traced for 400 feet. Some 1,000 feet southeast, another vein has been traced for 900 feet. About 3,000 feet southeast of this is the Cartwright showing, along which quartz and mineralization occur for some 700 feet; and in the same strike, 400 feet still farther southeast, is another vein, traced for 250 feet to near the eastern boundary of the property.

Thus the general zone of shearing in which the veins occur has been traced for nearly two miles across the property. Dykes of grey and red porphyry closely parallel the veins in the western portion of the zone. The gold values occur in the quartz associated with pyrite, or in the wall-rocks, which are impregnated with pyrite near the quartz. At several places along the No. 2 vein-system and at different vertical depths, some six ore-zones have been indicated. These range from 150 to 750 feet in length, and from 3.6 to 8.7 feet in average width.

On the Cartwright showing, the quartz is not so much in distinct veins as in parallel injections in a thinly banded schist which is partially replaced by quartz and by reddish aplitic material. The quartz and schist are mineralized with pyrite, quite heavily in places, over widths of several feet. Faults along which there have been displacements of a few feet, cross the zone at $N.60^{\circ}-85^{\circ}E$. Drilling under this zone has indicated commercial ore over a length of 252 feet and an average width of 5.6 feet at a vertical depth of 82 feet, and for a length of 550 feet over an average width of 5.1 feet at a vertical depth of 137 feet.

The total amount of ore indicated by exploration, mainly above 150 feet, is estimated by the Company as in excess of 80,000 tons, with the value between \$11 and \$12 per ton.

No work is being done on the property during the present winter (1936-37).

GRANADA GOLD MINES, LIMITED

The Granada Gold Mines, Limited, carried on surface exploration over a group of claims that adjoin the Florence River (Quebec) Gold Mines property on the east and extend eastward to Cameron lake. The vein-zone of Florence River Gold Mines has been traced from a point 100 feet east of the east boundary of that property across the southwest corner of claim A.57354 of the Granada group and thence into ground held by A. Cook. On the Granada property, the zone is exposed at intervals for nearly 300 feet. Within this distance are intermittent lenticular quartz veins up to 30 feet in length and rarely over one foot wide. The distinct veins and lenses of quartz are in general sparingly mineralized. In addition, there is *lit-par-lit* injection of quartz and red aplitic material in well-bedded tuffs

and volcanic flows, and these injections are in places well-mineralized with pyrite and a little chalcopyrite over widths of several feet. The general strike of the zone is S.65°E. Within 100 feet of the south boundary of the claim, the shear planes are much contorted, and their general direction changes to S.20°E. There is here evidence of faulting along a plane striking S.45°W., and the position of the mineralized zone on the Cook claims, just to the south, suggests that the zone has been displaced 100 feet to the southwest, on the southeast side of the fault. The Company reports that assays of grab samples along the zone showed erratic gold values, and that those from channel samples across the zone varied between a trace and \$30.00 per ton in gold.

Some gold values are also reported from an outcrop of granodiorite on the west shore of Cameron lake. The showing was not further explored, due to heavy overburden.

COOK CLAIMS

A1. Cook holds a group of claims adjoining the Florence River (Quebec) Gold Mines property on the west and the Granada property on the north. As mentioned in describing the latter property, the vein-system crossing the southwest corner of the Granada group extends, and is faulted south, into the most northwesterly of the Cook claims.

Considerable trenching has been done within 200 feet of the north boundary of the claim and some mineralization, consisting of pyrite in quartz stringers and silicified rock, is exposed. Due to heavy overburden this could not be traced immediately to the southeast, so its extent is difficult to estimate. In the late fall, trenching was being started at a point several hundred feet farther southeast in the hope of picking up the zone.

HOLLINGER-WAITE PROPERTY

Hollinger Consolidated Gold Mines, Limited, did surface exploration and diamond drilling in twelve holes on a group of nineteen claims lying between the Florence river on the west and the property of the Florence River (Quebec) Gold Mines on the east. Five of the claims are held by J. H. C. Waite, five by J. E. McNeil, and the remainder by the Hollinger Exploration Company, Limited.

Little rock is exposed on the claims and much difficulty was experienced in drilling through the heavy overburden. Ten of the holes are spaced at intervals over a distance of 4,500 feet, along a line running N.7°W. through parts of claims A.57970, 57969, 58056, 58055, and 58054. The drilling was done in an attempt to pick up the continuation of the zone in the Florence River Gold Mines property, or one parallel to it. Logs of the drill holes, excepting the first four, which are on Waite ground, were supplied by Hollinger Consolidated Gold Mines. They show that no large quartz veins or mineralized zones were intersected, but some of the holes cut small quartz veins and schist mineralized with pyrite. Three holes in the south part of claim 58056 showed mineralization in one or two intersections over widths up to three feet carrying only low gold values, and one intersection of 1½ feet carrying \$9.00 per ton in gold. Two of the holes showed no gold values. One of these was drilled north from near

the south boundary of claim 57963, and the other south from the same location into claim 57966. The country rock consists mainly of volcanic flows and agglomerate, both in places highly carbonated and containing also some tourmaline and fluorite. The drill cores show some porphyry dykes cutting the volcanics.

PROSPECTORS AIRWAYS COMPANY, LIMITED

In the fall of 1935, the Prospectors Airways Company, Limited, made a discovery of gold-bearing quartz on a group of claims lying northwest of Cameron lake. The showing is a mile and a half northwest of the lake. The quartz occurs along sheared zones in diorite and is well-mineralized with pyrite, chalcopyrite, and galena. Trenching on the showing during the summer of 1936 did not reveal important dimensions.

WEDDING RIVER GOLD MINES, LIMITED

This Company did surface exploration work over a group of claims lying north of the Florence River (Quebec) Gold Mines property. They were acquired from the Harricana Basin Mining Company, Limited ^①. The Company reports that their work failed to disclose anything of importance. Further exploration is planned for the coming season.

Late in the fall of 1936, P. Swanson discovered a gold-bearing mineralized zone about one claim west of the boundary of the group held by the above Company. The writer did not have an opportunity to visit the showing.

TECK-HUGHES GOLD MINES, LIMITED

Teck-Hughes Gold Mines, Limited, were engaged in surface exploration over a group of ten claims in Desjardins township during the summer of 1936. Most of the trenching was done on claim A.58276, near the north boundary of the Florence River Gold Mines claims. The Company reports that little encouraging mineralization was discovered, though some of the samples assayed yielded low values in gold. Little rock is exposed elsewhere on the claims.

DUBUISSON MINES, LIMITED

Dubuisson Gold Mines Limited, did extensive trenching on a group of claims lying across the Florence river about two miles north of the south boundary of Desjardins township. No mineralized zones of interest were exposed by the work.

OTHER PROPERTIES IN DESJARDINS TOWNSHIP

Some work was done by West Flo Gold Mines, Limited, on a group of claims east of the Florence river, near the south boundary of the township. The Manitoba Basin Mining Company explored a group of claims lying northwest of those held by Wedding River Gold Mines. Results of work on these properties are not known to the writer. On the latter group, few if any rock outcrops had been found at the time the writer visited the property in June, 1936.

^① Que. Bur. Mines, Ann. Rept., Pt. B, 1935, pp. 105-106.

GREVET TOWNSHIP

During the summer of 1936, the Engineers Exploration Company carried on surface exploration over a large group of claims lying southeast of Cameron lake. Included in the claims are those staked by the Company in 1935 and those on which the Cameron-Beck showing is located ①. The Company was not successful in uncovering extensions of the previously discovered mineralized zones or in locating new ones of importance. Work was hampered by the large areas of muskeg on the claims.

Similar lack of success is reported by the O'Brien Gold Mines, Limited, in their exploration of a group of twenty claims, Nos. A.56793 to 56812, about two miles south of Cameron lake. Though some mineralized zones were trenched, gold values proved negligible.

P. O'Leary did some trenching on the shore of Wedding lake, near the inlet of the Wedding river, as well as on the long island east of this point. Pyrite mineralization was observed at each place, but only low gold values are reported by Mr. O'Leary.

Prospecting in the vicinity of Wedding lake was also carried on by the Ceres Exploration Company in the early part of the summer of 1936.

MISCELLANEOUS AREAS

In addition to the discoveries referred to in the foregoing pages, others were made, and exploration work was carried on, in parts of the District of Abitibi which the writer did not have an opportunity to visit.

Late in the fall of 1936, the Prospectors Airways Company, Limited, made a gold discovery near the northeast bay of Lac La Trève.

Prospecting was carried on by the McKay (Quebec) Exploration Company, Limited, in a belt of country extending west from Lac Inconnu to the Baptiste river. The Company reports that no important mineral discoveries were made.

Ferguson Explorations, Limited, also had parties prospecting in the Lac Inconnu area. Though promising-looking quartz veins and sulphide zones have been discovered in this area, they have not as yet been found to carry gold values of interest. Ferguson Explorations also hold claims in Obalski and Brongniard townships, in the Chibougamau-Opemisca region and an interest in Daubrée Gold Mines, Limited. The latter Company has a group of fifty-five claims in Daubrée township, west of the Opemiska Copper Mines property. Some gold-bearing mineralized zones are reported on these claims.

In the late fall of 1936, a gold discovery was reported in Laas township, near the confluence of the Taschereau and Bell rivers.

Discoveries made in Bruncau and Franquet townships, near the Bell river, in 1936 were examined by G. Vibert Douglas. They are described in his report on the geology of the area ②.

① Que. Bur. Mines, Ann. Rept., Pt. B, 1935, pp. 106-107.

② Que. Bur. Mines, Ann. Rept., Pt. B, 1936.

EMPLOYMENT, WAGES, AND ACCIDENTS IN MINES AND QUARRIES DURING THE YEAR 1936 ①

EMPLOYMENT AND WAGES

The number of men employed in the mining industry of the Province during 1936 reached a new high figure of 17,646. Compared with the previous year, this is an increase of 14 per cent.

The total number of working days for all employees was 3,978,740, which is equivalent to the work of 13,262 men each employed for 300 days, the 'standard' year adopted by the Bureau for statistical purposes.

Returns of employment were received from 264 mines, 152 quarries, 3,479 sand and gravel pits (of which 2,619 were operated by the Provincial Roads Department), and also from numerous claim holders who completed the required amount of assessment work.

TABLE I

WORKMEN EMPLOYED IN MINES AND QUARRIES IN THE PROVINCE OF QUEBEC, 1933 TO 1936

	1936	1935	1934	1933
Number of men employed.....	17,646	15,473	13,180	10,737
Number of men on a 300-day basis.....	13,262	11,326	9,561	7,431

The generally upward movement that has characterized employment in mines, proper, since 1932, continued during the year under review, with an increase of 32.3 per cent over the previous year. In the quarries, there had been improvement for the two preceding years, but the progress was not maintained during 1936, when employees numbered slightly less than in 1935. This is attributable in the main to a reduced number of men employed in the operation of quarries producing dimension stone.

The distribution of workmen over the various branches of the mining and quarrying industries is given in Table II. In the mines group, gold mining is by far the principal item and in 1936 gave employment to 5,140 men, thereby exceeding the previous peak, established in 1935, by no less than 52.6 per cent. Among others in the metallic group, a slight gain in employment is shown in zinc and lead mines and in copper and pyrite (sulphur ore) mines. Unimportant decreases were recorded in chrome, titaniferous iron ore, and molybdenite mines. In the asbestos-mining industry, an active demand for labour continued throughout the year, and the total number of employees rose to 2,829, a gain of 44.2 per cent. Employment in the magnesian-dolomite industry increased from 179 to 204 men, or by 14 per cent. This is ascribable to greater activity in the metallurgical industry and also to the marketing of new products. Some improvement in employment is shown in most of the other branches of non-metallic mining. Exceptions were industrial lime, mica, mineral water, soapstone, and industrial-sand operations, in each of which fewer men were employed than in 1935.

In the quarry group, employment gains were registered in the cement, brick and other clay products, shale, and marble branches of the industry.

① Compiled by Henri Girard, from reports of Inspectors of Mines.

TABLE II

DISTRIBUTION OF WORKMEN IN THE VARIOUS MINES AND QUARRIES

	NUMBER OF MEN EMPLOYED	NUMBER OF MEN CALCULATED ON 300-DAY BASIS	
	1936	1936	1935
MINES:			
Asbestos.....	2,829	2,456	1,940
Copper.....	1,870	1,964	1,918
Chrome, titaniferous iron ore, zinc, lead.....	241	213	149
Feldspar.....	71	34	36
Gold, silver.....	5,140	4,594	3,222
Industrial lime.....	260	194	265
Magnesian-dolomite.....	204	219	145
Mica, phosphate.....	126	71	83
Mineral pigments, ochres.....	59	33	31
Mineral water.....	13	5	11
Molybdenite.....	5	1	4
Peat.....	21	6	2
Quartz, silica rock, garnet.....	131	100	87
Talc, soapstone.....	33	19	29
Assessment work on claims.....	662	662	503
SUB-TOTALS.....	11,665	10,571	8,425
QUARRIES:			
Brick, pottery.....	689	285	246
Cement.....	359	388	291
Granite.....	616	236	357
Limestone.....	1,124	526	618
Marble, slate, sandstone.....	248	124	152
Sand and gravel.....	2,945	1,132	1,237
SUB-TOTALS.....	5,981	2,691	2,901
TOTALS.....	17,646	13,262	11,326

The total number of men engaged in the working of mines, in the development of mining properties, and in assessment work on claims, was 11,665 in 1936 against 8,819 in the previous year. Prospectors searching for new mineral deposits and staking claims are not included in these figures. The number so engaged was very appreciably greater than in 1935, as prospecting and exploration in mineral areas in various sections of the Province was never before so active.

As shown in Table III, the number of men working in producing mines was 8,222. For non-producing mines, the total was 2,781. Men engaged in assessment work on claims numbered 662. There was an increase for each of these divisions.

Wages paid to workmen in the mines and quarries of the Province amounted to \$13,970,672, as compared with \$11,136,456 in 1935. Details of the wages in the several branches of the industry are given in the table of mineral production on page 6. Of the total, workmen in mines received \$11,868,497 and those in quarries \$2,102,175, which figures compare respectively with \$8,978,308 and \$2,158,148 in 1935. Including both mines and quarries, the average wage earned by a 300-day workman was \$1,053; in 1935 it was \$983. Wages were higher than in the previous year in both mines and quarries. In the quarries, several collective labour agreements entered into during the year between groups of workmen on the one part and their employer on the other, resulted in a slightly higher average daily wage in these industries.

A number of employees in one granite-cutting establishment, at Saint-Samuel, ceased work on May 1st, demanding a new agreement under the Collective Labour Agreements Extension Act, with increased wage and employment only of members of the Union. As a result of conciliation by the Provincial Department of Labour, work was resumed a week later, under conditions prevailing prior to the dispute.

TABLE III

WORKMEN EMPLOYED IN PRODUCING AND NON-PRODUCING MINES
IN 1936

	NUMBER OF WORKMEN	WAGES	NUMBER OF DAYS' WORK	NUMBER OF 300-DAY WORKERS
Producing mines.....	8,222	\$ 9,013,525.20	2,416,350	8,054
Non-producing mines.....	2,781	2,195,938.80	556,188	1,854
Assessment work on claims.....	662	659,033.00	198,679	662
TOTAL.....	11,665	\$ 11,868,497.00	3,171,217	10,570

ACCIDENTS

Accidents to employees in all mines, quarries, and annexed plants caused 19 deaths and 915 injuries of over seven days' disability. For the total number of accidents, the rate per thousand workers on the 300-day basis was 70.4. In mines, proper, the rate was higher in 1936 than in 1935, but in quarries it was substantially the same as in the previous year. The distribution of accidents, fatal and non-fatal, in mines, quarries, and annexed plants is shown in Table V.

TABLE IV

SUMMARY OF ACCIDENTS IN MINES, QUARRIES, AND ANNEXED PLANTS IN 1936

	NUMBER 300-DAY WORKERS	ACCIDENTS		TOTAL	PER 1,000 300-DAY WORKERS
		FATAL	NON-FATAL		
Mines.....	10,571	18	790	808	76.4
Quarries.....	2,691	1	125	126	46.8
TOTAL.....	13,262	19	915	934	70.4

TABLE V
ACCIDENTS IN MINES, QUARRIES, AND ANNEXED PLANTS IN THE PROVINCE
OF QUEBEC DURING 1936

	FATAL		NON-FATAL		TOTALS	
	No.	%	No.	%	No.	%
MINES:						
Underground.....	9	1.0	415	44.4	424	45.4
Open pits.....	1	0.1	101	10.8	102	10.9
Surface.....	6	0.6	121	13.0	127	13.6
	16	1.7	637	68.2	653	69.9
QUARRIES:						
In pits.....	1	0.1	90	9.7	91	9.8
Surface.....	0		18	1.9	18	1.9
	1	0.1	108	11.6	109	11.7
ANNEXED PLANTS:						
Concentrators.....	0		108	11.6	108	11.6
Smelters.....	1	0.1	20	2.1	21	2.2
Shops.....	0		31	3.3	31	3.3
Warehouse.....	0		7	0.8	7	0.8
Power plants.....	1	0.1	4	0.4	5	0.5
	2	0.2	170	18.2	172	18.4
GRAND TOTAL.....	19	2.0	915	98.0	934	100.0

FATAL ACCIDENTS:

The death rate based on a standard of 300 days of exposure was 1.43 per thousand employees, as compared with 1.28 in 1935. Of the nineteen fatal accidents, only one occurred in the quarries group, and two in annexed plants. 'Fall of person' ranked first among the causes of fatalities in and about the mines (see Table VI). 'Handling of explosives' and 'haulage' were second as a cause, each of them accounting for three deaths. Fatal accidents occurring in the course of blasting have headed the list for the two preceding years.

TABLE VI
ANALYSIS OF FATAL ACCIDENTS IN MINES, QUARRIES, AND ANNEXED PLANTS
IN THE PROVINCE OF QUEBEC DURING 1936

CAUSE OF ACCIDENT	UNDER-GROUND	OPEN PITS	SURFACE	ANNEXED PLANTS	TOTAL	
					No.	%
MINES:						
Fall of person.....	3	0	1	0	4	22.2
Haulage.....	1	0	2	0	3	16.6
Explosives.....	3	0	0	0	3	16.6
Rock rolling down incline.....	2	0	0	0	2	11.1
Slide of ground.....	0	0	2	0	2	11.1
Burns.....	0	0	0	1	1	5.6
Electricity.....	0	0	0	1	1	5.6
Fall of objects.....	0	0	1	0	1	5.6
Scaling.....	0	1	0	0	1	5.6
TOTALS.....	9	1	6	2	18	100.0
QUARRIES:						
Slides of ground.....	0	1	0	0	1	100.0
TOTALS.....	0	1	0	0	1	100.0

NON-FATAL ACCIDENTS:

Table VII classifies non-fatal accidents according to cause or occupation.

Mines :

'Loading cars and boxes' was, as in the previous year, the most frequent source of accidents in mines, accounting for 12.2 per cent of the total. 'Handling rocks or objects' came second with 11 per cent, followed by 'drilling', with 10.5 per cent. Other frequent causes were 'fall of person', 'haulage', and 'fall of rock'.

Quarries :

'Loading boxes' and 'handling stone or objects' were, as usual, the chief causes of accidents in quarries. 'Haulage', also, is responsible for many accidents in quarries.

Annexed Plants :

The principal causes of injuries in annexed plants were machinery and tools, fall of person, handling objects and stone, and falls of objects or rocks. Accidents caused by machinery and tools increased in 1936. They were responsible for 24.7 per cent of the non-fatal injuries in annexed plants.

TABLE VII

ANALYSIS OF NON-FATAL ACCIDENTS IN MINES, QUARRIES, AND ANNEXED PLANTS IN THE PROVINCE OF QUEBEC DURING 1936

CAUSE OF ACCIDENT	UNDER-GROUND	OPEN PITS	SURFACE	TOTAL	
				No.	%
MINES:					
Loading cars and boxes.....	37	41	0	78	12.2
Handling rocks or objects.....	48	7	15	70	11.0
Drilling.....	55	9	3	67	10.5
Fall of person.....	38	5	16	59	9.3
Haulage.....	43	2	12	57	9.0
Fall of rock.....	40	13	1	54	8.5
Machinery and tools.....	16	5	19	40	6.3
Fall of objects.....	18	2	16	36	5.7
Rock rolling down incline.....	25	0	1	26	4.1
Lifting heavy object.....	16	0	7	23	3.6
Scaling.....	12	8	0	20	3.1
Scaffolding and ladder.....	11	0	5	16	2.5
Hoisting and shaft.....	14	0	2	16	2.5
Explosives.....	12	1	1	14	2.2
Hammering stone and cobbing.....	8	4	2	14	2.2
Slides of rock and ground.....	5	2	6	13	2.0
Burns.....	3	0	6	9	1.4
Miscellaneous.....	3	1	4	8	1.3
Dust.....	6	1	0	7	1.1
Nails.....	3	0	1	4	0.6
Cable-derrick.....	0	0	2	2	0.3
Gearing, shafting, belting.....	0	0	2	2	0.3
Timbering.....	2	0	0	2	0.3
TOTALS.....	415	101	121	637	100.0

TABLE VII—Continued

CAUSE OF ACCIDENT	UNDER- GROUND	OPEN PITS	SURFACE	TOTAL	
				No.	%
QUARRIES:					
Loading boxes.....	0	33	5	38	35.2
Handling stone or objects.....	0	15	3	18	16.7
Haulage.....	0	10	5	15	13.9
Sides of rock and ground.....	0	8	0	8	7.4
Hammering stone.....	0	7	0	7	6.5
Lifting heavy object.....	0	5	1	6	5.6
Fall of person.....	0	3	1	4	3.7
Fall of rock.....	0	4	0	4	3.7
Machinery and tools.....	0	2	1	3	2.8
Derrick.....	0	2	0	2	1.8
Drilling.....	0	1	0	1	0.9
Fall of objects.....	0	0	1	1	0.9
Miscellaneous.....	0	0	1	1	0.9
TOTALS.....	0	90	18	108	100.0

CAUSE OF ACCIDENT	CONCEN- TRATORS	SMELTERS	REPAIR SHOPS	WARE- HOUSES	POWER PLANTS	TOTAL	
						No.	%
ANNEXED PLANTS:							
Machinery and tools.....	26	2	14	0	0	42	24.7
Fall of person.....	18	3	2	2	0	25	14.7
Handling objects and stone.....	12	2	5	2	1	22	12.9
Fall of objects or rocks.....	14	7	0	0	0	21	12.3
Burns.....	4	2	1	0	2	9	5.3
Haulage.....	3	1	4	0	0	8	4.7
Hammering stone and cobbing.....	6	0	2	0	0	8	4.7
Lifting heavy objects.....	5	1	1	0	0	7	4.1
Gearing, shafting, belting.....	5	0	1	1	0	7	4.1
Bagging and handling bags.....	4	0	0	2	0	6	3.5
Dust.....	2	2	0	0	0	4	2.4
Miscellaneous.....	3	0	0	0	0	3	1.8
Nails.....	2	0	0	0	1	3	1.8
Scaffolding and ladder.....	2	0	1	0	0	3	1.8
Explosives.....	1	0	0	0	0	1	0.6
Loading boxes.....	1	0	0	0	0	1	0.6
TOTALS.....	108	20	31	7	4	170	100.0

PREVENTION OF ACCIDENTS

The safety organizations which are functioning actively in some mines and quarries of the Province are doing excellent work. More operators should adopt measures for organizing their workmen to become 'safety conscious'. This is obviously the most feasible means of lessening the number of accidents, and also of keeping mine compensation assessment rates at a low level. From the material standpoint alone, the importance of reducing accidents to the lowest possible level is self-evident when one considers that, in almost every class of mining, the provisional rates of the Quebec Workmen's Compensation Commission have been increased for the coming year.

A safety organization which has been signally successful in its efforts towards accident prevention is that of the Canada Cement Company. Believing that a knowledge of their work would be of assistance to others, Mr. J. H. G. Dempster, Director of Safety for the Company, has very kindly prepared the following account of the safe working conditions provided for employees at their quarries and plants.

SAFETY WORK OF THE CANADA CEMENT COMPANY, LIMITED ①

The accident-prevention programme of the Canada Cement Company, Limited, may be divided into two phases—the mechanical and the educational.

With the mechanical, or safeguarding, phase, we are all familiar, and since, in most industrial set-ups, the utmost that can be done in the way of preventing accidents is already closely approached, very little need be said here on this phase of the subject.

To illustrate: In the Portland cement industry, it has been estimated that 88 per cent of all accidents are due, in the last analysis, to human failure. Some officials go so far as to place the figure at 95 per cent. Therefore, after a plant is adequately protected, physically, accident prevention work becomes a matter almost entirely of vigilance and education. This constitutes the basis of Canada Cement's present programme. In the quarries operated by the Company, all regulations concerning mining, established by the Provincial Mining Acts, are strictly adhered to, as also are all other regulations that have been evolved through long and sometimes tragic experience; but no amount of hard-and-fast legislation, solely, can make a body of men, *ipso facto*, safe workers or 'safety conscious'—this condition must be brought about by education—'leading out'.

For example, the Canada Cement Company, operating quarries, handling dynamite, and employing machinery of the largest and most powerful type, has been able, through a well-organized educational programme, to reduce its number of accidents over 93 per cent in the last fifteen years. All the plants of the Company have operated with 'no-accident' years—some of them with as many as seven such years during that period.

The problem of educating the rank and file in accident-prevention has been handled in several ways:

- (1) By the organization of Safety Committees, presided over by the Superintendent or the plant Safety Director.
- (2) By the discussion and study, by the Safety Committees, of current accidents occurring in the industry as a whole.
- (3) By periodical meetings attended by all employees, at which a noted outside accident-prevention official is generally present to address the men on some particular phase of safety work.
- (4) By conducting, from time to time, 'No-accident' campaigns.
- (5) By the use of photographs, posters, bulletins, and other material supplied by Societies for the Prevention of Industrial Accidents, the National Safety Council, etc.
- (6) By keeping a careful record of all minor injuries treated in the First-Aid hospital, and, by discussion and analysis of these records, locating and reinforcing the weak spots in accident-prevention work.

① By J. H. G. Dempster, Director of Safety, Canada Cement Company.

- (7) By the teaching of the principles of 'First-Aid' to as many employees as possible. While this training is primarily for the purpose of instructing employees what to do after an accident occurs, at the same time it makes them 'accident minded' and thus helps to prevent accidents.

The interest and co-operation of the executives and supervisory forces of the Company are vital factors in the scheme and are exemplified by the active part these officials take in the work and by their presence at Safety Committee meetings. Safety Committees are, and should be, comprised of foremen and departmental heads, as such committees should be competent to take executive action on all safety matters. In addition, the Safety Committees must be composed of men who are trained in accident-prevention, if they are to be responsible for promoting safety in their departments.

Foremen, being usually men with long service, are in general best qualified for this work of guardianship. These men are trained to understand the causes of accidents, by a detailed study of the unsafe practices and hazards of their particular departments.

Safety campaigns are conducted periodically. Usually they start with a massed meeting of all employees, addressed, when possible, by a prominent speaker. Accident-Prevention Association material also features these campaigns. The ranking Executive acts as Chairman, and a definite objective is usually set for the campaign. All the plants of the Canada Cement Company are members of the Portland Cement Association, and this Association awards and re-awards a trophy for the completion of a calendar year without accidents. This helps to maintain interest in safety throughout the year. Every plant of the Company has been awarded this Trophy at least once, and some as many as seven times.

To further locate possible weak spots and to arouse and stimulate competition between departments, dials and recording boards of varied designs have been prepared to show each day the relative standing of the department and the number of days since the last lost-time accident. The figures on these boards are changed by departmental employees, and in most cases humorous penalties are devised in case an employee forgets to change the dial when his turn comes. The standing of each plant is given at all times to the Safety Director at the Head Office, and he in turn sends a letter each month to all plant superintendents showing the standing of all plants of the Company, and giving full details of any and all accidents that may have occurred in any of the plants.

The foregoing accident-prevention methods are perhaps common to many branches of industry, and, earnestly carried out, they cannot help but bring about remarkable results—a saving not only of money, but also of that for which no amount of money can compensate—human life.

That the measures adopted have been successful is shown by the fact that not only have accidents been reduced by 93 per cent in the past fifteen years, as mentioned above, with a corresponding decrease in compensation costs, but machinery and equipment are in a better condition of maintenance, plants are clean and tidy, and the morale and efficiency of the men in the ranks is at a very high peak. For the first six months of this year—

1937—in all the manufacturing plants and branches of the Canada Cement Company, Limited, operating quarries, crushers, kilns, grinders, silos, navigating vessels, using upwards of 600,000 pounds of explosives yearly, and processing two million tons of rock, there has not been a single lost-time accident. Truly, "Safety Pays".

SAFETY ASSOCIATION OF THE QUEBEC ASBESTOS PRODUCERS ①

The Safety Association of the Quebec Asbestos Producers' Association is now in its fifth year of operation. The Association was formed in virtue of Article 106 of the Workmen's Compensation Act, 1931, which states, in brief: "Employers in any of the classes of Schedule I may form themselves into an association for accident prevention and make rules for that purpose. Rules so made, and approved by the Lieutenant-Governor-in-Council, shall be binding on all employers in industries included in the class".

During 1936, the hours worked in the asbestos mines and mills increased by two million over the previous year. This increase is the combined result of more working days and more men employed. Although, from the accident point of view, the 'exposure' was increased over 35 per cent, the 'experience increase' was slight. This is attested by the fact that whereas practically all mine accident-rate classifications under the Workmen's Compensation Commission were raised in 1936, in some instances 25 to 30 per cent, the rate for the asbestos group remained the same as in 1935.

First-Aid continues to be taught to the mine employees, and during the year an additional twenty-five were awarded their Quebec Bureau of Mines certificate for proficiency, testifying to their fitness to render proper First-Aid to the injured in the mines. The number of employees holding such certificates is now approximately one hundred and twenty-five.

Hard hats and safety shoes have proved their worth in underground operations, for with several hundred men so employed, not one disabling head or toe injury has been reported in over four years. With this experience in mind, the open pit operators are enforcing the same precautions. At the present time, it is required that all drillers, helpers, and scalers wear hard hats. This regulation will be extended in the near future in some mines to include all employees in open pits.

Safety belts of approved construction, for scalers, are being tried at several properties. When sufficiently tested and approved, they will become standard throughout all mines for this type of work. This will remove the constant hazard arising from insecurely tied knots in the scaling ropes.

As mentioned in our report for 1935, First-Aid cannister units are placed at suitable points in the various mines. During the year, the number of these units was increased from fourteen to eighteen. They comprise a stretcher, rubber and wool blankets, splints, tourniquet, bandages, slings, etc., all contained in a sealed metal can that guards the equipment against underground moisture and dust.

① By Walter E. Montgomery, Safety Engineer, Quebec Asbestos Producers' Association.

Guarding of hazard points around the mills and mines has been so perfected that very few accidents are caused by the lack of proper precautionary measures. The majority of the accidents that do occur are classed as 'man failures', and, to eliminate these, safety education is extended through the medium of monthly safety meetings at practically all the asbestos properties. It is a general practice to appoint workmen to Inspection Committees, with the aim that, in time, all employees will have been trained to 'think safety' as well as to work safely.

Due credit for the excellent accident record of the asbestos mines is extended to all workmen and officials of the Association members, and to the district Inspector of the Quebec Bureau of Mines.

DESCRIPTION OF FATAL ACCIDENTS

January 3rd.—Phidine Bouchard, 50 years of age, was killed by a fall of overhanging material in a gravel pit owned by the Harricana Amalgamated Mines, Inc., at Val D'Or, Dubuisson township.

The operation was under the jurisdiction of the Department of Roads, and Bouchard was employed by J. Paré, a contractor building the Amos-Val d'Or highway.

On the day of the accident, the gravel pit's face was approximately thirty feet in height. It was very steep up to within two feet of the top, which was undercut, making a shelf two feet in width. Bouchard's job was to keep loose gravel flowing to a steam shovel at the toe of the slope. To do this, it was necessary for him to stand half-way up the slope, and to poke the gravel with a long iron bar. A part of the overhanging frozen material gave away suddenly, striking him on the head, and he was caught in the slide of gravel. When extricated, he was found to be dead.

Verdict: Accidental death.

February 13th.—Alphonse Blais, age 29, employed as a grizzly tender at the Noranda mine, was killed when caught between two large pieces of ore on No. 501 grizzly. This grizzly is at the east end of a series of grizzly chambers in *H* ore-body, above the 500-foot level.

At the time of the accident, some large slabs of ore had caused a partial hang-up of the ore above the 501 grizzly. Blais went for some powder to blast it down. A companion, Lawrence Upton, working on the adjoining grizzly, saw Blais return. Shortly afterwards, Upton heard the muck run in 501 grizzly, and he went to investigate. He found Blais pinned between two large rocks, on top of the grizzly. The rock resting on Blais' body was too large to move, so he went to the level and obtained help. The rocks were pried apart and Blais was extricated, but he died as a result of internal injuries.

Verdict: Accidental death.

February 26th.—John Chorny, 31 years of age, was fatally injured in a stope at the Canadian Malartic mine.

An open system of stoping is practised at the Canadian Malartic mine. In this method, a raise is driven from the main haulage through the centre of the ore-body. The ore is mined by underhand methods through a system of benches.

On the night of February 25th, Chorny and three companions descended to a bench twenty feet below the 125-foot level. This bench had been drilled and blasted on the previous shift, and the four men set to work to clean off the loose muck in preparation for drilling. None of these men were equipped with safety harness, although this equipment was nearby on the 125-foot level. At about 2.30 a.m., Chorny was using a bar to dislodge a piece of rock from the floor of the bench. It came away suddenly, with the result that Chorny lost his balance and fell backward over the edge of the bench. His body was found on the slope about 50 feet above the grizzlies on the 375-foot level, indicating that he fell a total distance of about 175 feet. Death was instantaneous.

Verdict: Accidental death.

March 26th.—Raymond Last, age 35, and Roméo Charbonneau, age 30, drillers, were fatally injured, and a third man was seriously hurt, by a premature blast in the mica mine of Blackburn Brothers, Limited, three miles north of Perkins, in Templeton township.

The three men were slashing the wall of a cross-cut on the 80-foot level of the mine by means of two series of three drill holes each, two feet apart. The drill holes were connected in series of three by means of electric detonators. As the firing was to take place quite close to the shaft, the detonator wires were connected with others leading up the shaft to the surface. After assuring themselves that there was no one in the mine, a 110-volt current was turned on the blasting circuit, igniting the charge. The detonation was distinctly heard by the men on surface. After a delay of five minutes, the three men went down the shaft in the bucket to connect the second series of drill holes to the leading wires. As they neared the face, the charge in one of these holes went off. Raymond Last was killed instantly, and Roméo Charbonneau died in hospital the following day. The cause of the premature blast could not be positively ascertained.

Verdict: Accidental death.

April 10th.—E. Hawkins, 31 years of age, employed at the Canadian Malartic mine, was killed in a slide of rock.

The 301 stope at the Canadian Malartic mine is a large open stope. From the grizzlies on the 375-foot level, the floor slopes upward at an angle of about 45 degrees, to permit the rock from the benches to flow to the grizzlies. This inclination is close to the angle of repose, and men may ascend the slope by following an irregular course.

On the morning of April 10th, Hawkins, Jack Chambers, and Bill Szceny, all grizzly men, were ordered to block-hole some large rocks on the grizzlies. They went up into the stope to clean the floor of any loose pieces of rock which might roll down to their working place. They found one large piece, estimated to weigh from 2 to 3 tons, against the south wall of the slope, about 100 feet (on the incline) above the grizzly. Szceny states that they tried to bar the piece down, but that there was fine muck around it, and they could not get a solid support for the bar. Hawkins decided to blast it down. They obtained powder, caps, and fuse. Hawkins stood below the large rock and Szceny handed him about four sticks

of explosive. As he was placing the explosive under the rock, it suddenly rolled over on top of him. His body rolled down the slope for about 10 feet. Help was secured, but he was dead before assistance reached him.

Verdict: Accidental death.

May 2nd.—Kenneth Delosier, grizzly tender, age 23, was fatally injured in falling through a series of inclined raises at the Noranda mine.

Shortly before 5 p.m. on May 2nd, Delosier and a companion, John Hodgins, were engaged in tending a grizzly below 18 stope, above the 9th level, at the west end of *H* ore-body. The ore flowing through this grizzly passes down a series of inclined raises to be drawn off at a chute on the 1,225-foot level. Hodgins states that he saw Delosier take up a bar, and commence to pry at the muck on the grizzly. At this instant, the muck started to flow through the grizzly, and Delosier fell forward through the opening, with muck running on top of him. Delosier was found on top of the muck. A stretcher was lowered, and in about 15 minutes he was hoisted out of the raise. His skull was severely fractured and he died a few hours later.

Verdict: Accidental death.

June 19th.—David Monteith, age 48, employed as a motor-man, was severely burned about the lower part of the body when his clothing was set on fire by molten slag. He died in the Youville hospital, Noranda, on the morning of July 2nd.

There are two reverberatory furnaces in the Noranda smelter. The slag is run off at the north end of each furnace through an inclined launder from the reverberatory floor to the slag tunnel below and into motor-drawn steel pots. Two electric locomotives, each hauling a train of four slag-pots, are in continuous operation, travelling back and forth between the slag tunnel and the dump.

At about 1.45 p.m. on June 19th, David Monteith brought his train of four empty pots into the slag tunnel. He spotted the train in the usual manner so that the first and fourth pots were opposite the No. 1 and No. 2 furnaces, respectively. The pots were then filled with molten slag. When this was completed, Monteith moved the train so that the third pot was under the No. 1 furnace. He had previously observed a rim of frozen slag on the second pot, which was still empty, and he descended from his locomotive with the object of removing this crust. In a moment of mental aberration, he tilted the first pot, which he had seen filled with molten slag. The slag commenced to flow on the floor of the tunnel and it splashed on his clothes, setting them on fire. Monteith was burned over the greater part of his body, especially the feet, legs, back, and hands. His death resulted from tonenua.

Verdict: Accidental death.

June 26th.—David Provençal, miner, was fatally injured in the open-pit of Canadian Refractories, Limited, at Kilmar, in Argenteuil county. The victim was scaling, with a bar, the ore that had been previously blasted in twenty-foot benches. A large lump of rock that he had dislodged caused

a slide of the broken rock lying above. Provençal and another scaler who was with him ran to escape, but the former was overtaken by the falling material before reaching the bottom of the pit.

Verdict: Accidental death.

July 2nd.—Mike Sandners, age 36, was fatally injured when the speeder on which he was riding, on the Beattie-Davangus railway spur, left the rails. The deceased was employed in the capacity of section-man by Beattie Gold Mines, Limited.

On the morning of July 2nd, the section crew of seventeen men were being transported to their work on a gasoline-engined speeder and trailer. Both vehicles are equipped with benches and hand-rails. At a distance of about nine miles from the Beattie mine, the railway curves sharply to the left, and there is a steep down-grade. Although the speeder was travelling slowly on this curve, the front wheels left the rails. The sudden jar caused Sandners, who was sitting in the front seat on the left-hand side, to overbalance. He fell forward, under the left front wheel, and the combined weight of trailer and speeder caused them to travel for a distance of about fifteen feet before coming to a stop. The injured man died shortly after medical aid reached him.

Verdict: Accidental death.

July 28th.—A. Matheson, shaft leader, age 42, was instantly killed when lightning set off some charged holes at the bottom of the new shaft at Greene Stabell Mines, Limited.

Deepening of this shaft from the 400-foot to the 500-foot level had just been completed. A short drift had been driven at the 500-foot level, and a small loading pocket had been cut out on the floor of the station. Excavation of the sump was in progress, and only one more round remained to be drilled and blasted to complete the present sinking programme. All blasting is done by electricity, from a locked switch-box in the dry-house. The lead wires from the switch box to the bulkhead are the only electric wires in the shaft.

Shortly after noon on July 28th, Patrick Harrison and A. Matheson descended the shaft to prepare blasting charges. One round of slash holes was drilled-off and loaded in the roof of the station. The face of the drift was also drilled-off and loaded with explosive. Eight missed holes in the bottom of the shaft were connected to another set of blasting wires. At about 1.50 p.m., Matheson had checked over the wiring of the eight missed holes in the bottom of the shaft, and ascended on the bucket to the ledge of the loading pocket. As Harrison was about to step on the bucket, an explosion occurred. He was thrown on the floor of the loading pocket and was uninjured. He then called to Matheson and received no reply. He jumped down from the ledge to the shaft-bottom and found Matheson lying there with the lower part of his body partly covered by rocks. It was later found that only the charged holes in the shaft bottom had exploded. Harrison stated that he found the circuit of the drift and slash rounds broken at one point, and this is probably the reason they were not detonated.

The day was cloudy and scattered showers had fallen. T. Temple, a mechanic, who was standing near the shaft at the surface, states that he saw a blue flame on the hoisting cable, and that a thunderclap was followed by two shots exploding underground.

Verdict: Accidental death.

August 10th.—R. S. Patterson, age 49, was killed on the surface at the Lake Guillet property of McIntyre-Porcupine Mines, Limited, when a set of framed timbers fell on him, crushing his skull.

On the afternoon of August 10th, R. S. Patterson, Francis MacDonald, and Jack Hartley were engaged in demolishing a water tower. The tank had been removed. The structure supporting the tank consisted of three sets of framed timbers on concrete foundation. Each set was made up of three 10 in. by 10 in. posts, cross-braced with planks. The cap, in each case, was a 10 in. by 12 in. timber, and the sill, which was bolted to the foundations, was of the same size.

At the time of the accident, one outside set had been removed. The centre set had been loosened, and was resting against the other outside set. Paterson was standing on the ground near the middle of the centre sill, and the frame set was sloping over him. MacDonald and Hartley were outside the sets. They warned Patterson to be careful, as he was prying at the base of the centre post with a pinch bar. Suddenly, the centre set slipped from its sill. The outside set, against which it had been resting, fell toward the centre. The cap of the outside set struck Patterson on the forehead, crushing his skull.

Verdict: Accidental death.

August 12th.—Hans Jensen, age 29, a skip-tender, was instantly killed when he fell from a staging to the footwall of the No. 2 shaft at the Canadian Malartic mine. Details of the accident are as follows:

The 60-degree incline shaft at the mine is being enlarged from two to three compartments. This work is carried out by raising, and the section is lagged-off from the rest of the shaft. A chute is built at the base of the lagged section, and the broken material is drawn from this chute when the section is too full. The chute is below the 3rd level loading-pocket. At the time of the accident, the muck in the shaft was about 15 feet below the 4th level station.

At about 2 a.m. on August 12th, James Mortson, miner's helper, descended the ladderway to the chute, with the object of drawing off some of the broken muck. A large piece of rock was blocking the opening, and he was unable to remove it. Jensen was working on the loading platform about 20 feet above the chute. He descended to assist Mortson. He was standing on a 2 in. by 6 in. plank, prying at the large rock with a piece of steel, when he lost his balance and fell. Jensen's body was found lying on the muck in the inclined shaft, about 15 feet below the 4th level.

Verdict: Accidental death.

August 31st.—James Walker, age 48, employed by Beattie Gold Mines, Limited, as a lineman in the electrical department, was electrocuted by handling a live cable.

The 3-phase, 2,200-volt lines servicing the mine hoists and part of the concentrator equipment are dead-ended to a cross-arm on a tower at the sub-station. A new system, recently devised, involved alterations to these conductors.

On the day of the accident, Walker was instructed to complete the installation of the 2,200 volt lines, and the attachments to them. With his helper, John Guttridge, he ascended by a ladder to the roof of the sub-station. A plank was placed across the cross-arms at the top of the tower and Walker stepped on this plank to commence his work. Guttridge remained on the roof of the sub-station, to hand any materials to Walker which he might need. The 2,200-volt lines were exposed close to the cross-arm, and Walker commenced to attach another 3-wire conductor to the exposed parts by means of galvanized clamps. At about 10.40 a.m., he was turning a nut on a clamp on the outer wire of the 2,200-volt system when his wrench slipped, and he fell forward across the bare conductors. The deceased came in contact with two of the 2,200-volt conductors through his wrench and his knee, and his body took the full charge.

Verdict: Accidental death.

September 28th.—Carl Howard, age 23, was seriously injured when the electric locomotive of the train he was driving collided with another train at a switch on the 21st level of the Noranda mine.

On the afternoon of September 28th, Ivan Jacques, motorman, had taken over the duties of switchman of train No. 2, while Howard was getting experience driving the locomotive. Howard had been told to hold his train in 21-04 cross-cut until he received orders from Jacques to proceed. It was the duty of the driver of train No. 2 to wait until train No. 1 re-entered 21-05 drift before proceeding past the switch at the junction of 21-05 drift and 21-04 cross-cut. Contrary to his instructions, Howard started his train. The locomotive he was driving struck the second car of train No. 1 as it emerged from 21-05 drift and became tightly wedged between this car and the east wall of 21-04 cross-cut. The front end of the locomotive rose up, and he was caught between its rear end and the first car of his train. His death resulted from internal injuries.

Verdict: Accidental death.

October 4th.—Boris Naidoff, 35 years of age, employed as a surface labourer, was fatally injured at the Beattie mine.

At about one o'clock in the afternoon of October 4th, James Lucas, a truck driver, was called to transport some crusher plates from a freight car to the crushing plant. He drove his truck from the garage to the freight car, where Naidoff and three other labourers were to help him to load. Rollers were necessary to unload the heavy pieces, so Lucas started off with his truck in the direction of the machine shop, where rollers could be obtained. Three of the labourers climbed up on the truck, before it started. Naidoff jumped on the running-board while the truck was in motion. As

the truck rounded a gentle turn, Lucas lost control, and the truck went into the ditch at the side of the road. The ditch is about three feet in depth. The truck did not stop until it had travelled a distance of 50 feet from where it left the road. Naidoff's body was pinned between the truck and the bank. Death occurred at about 5 p.m., due to haemorrhage and shock.

Verdict: Accidental death.

October 8th.—Olivier Bachand and Eugène Fradette, aged 21 and 38 years, respectively, were killed by suffocation in the yard near the concentrator at the Eustis mine, operated by the Consolidated Copper and Sulphur Company.

Since three or four years ago, the Company has accumulated a stock-pile of pyrite concentrate alongside the Quebec Central Railway line. This pile has been laid on the side of a hill and its maximum height is about fifteen feet. The nature of the soil below this accumulation is of two kinds. In one section, the concentrate rests on an old stone dump and is kept dry and well drained. At the other end of the stock-pile, the material is lying on surface clay which is rather non-permeable, and here the concentrate remains wet.

At the time of the accident, a crew of twenty men was assisting in loading railway cars with concentrate. A conveyor belt was used to transfer it from the stock-pile to the cars. Bachand and Fradette were standing between the conveyor and the toe of the pile. While they were shovelling, a slide of the concentrate occurred over an area 46 feet long by 8 feet wide at the bottom and tapering to a few inches at the top. The material was running parallel to the conveyor, which acted as a dam. The victims were completely buried and their bodies were taken out about two hours later.

Verdict: Accidental death.

November 26th.—Fernando Boucher, age 23, was seriously injured in falling from a platform to the ground, on the property of Sigma Mines, Limited, in Bourlamaque township. He died on the same day from a fractured skull.

The construction of a 500-ton mill is under way on the Sigma property. This work is in the hands of a firm of building contractors, Hill-Clark-Francis, Limited. Most of the concrete foundations have been poured and a part of the steel structure has been erected. Concrete is transported from the mine to the work in two-wheeled buggies. The buggies are wheeled up an inclined ramp from the mining platform to the foundation level, and, from the latter point, a flat platform leads to the place where the concrete is poured. To negotiate the upward-sloping ramp, two men, using detachable hooks, pull the buggy, while the man in charge pushes it from the rear. Twenty feet beyond the top of the ramp, the platform is extended to double width, in order that the men pulling the buggy may stand aside. The platform is about four feet above the ground level.

At the time of the accident, Lionel St-Hilaire and Fernando Boucher were pulling the buggy. They had reached the top of the ramp, but, instead of continuing to the place where the platform is double-width, Bou-

cher stepped to the edge to permit the buggy to pass. It brushed against him and he lost his balance, falling backward to the ground below. In falling, he caught the wheel of the buggy, and it fell to the ground beside him. In rebounding, the handle of the vehicle struck him at the base of the skull, causing the serious injury that resulted in his death.

Verdict: Accidental death.

LIST OF THE PRINCIPAL OPERATORS AND OWNERS OF MINES AND QUARRIES IN THE PROVINCE OF QUEBEC

I.—METALLIC ORES AND MINERAL PRODUCTS

NOTE.—Operators whose names are preceded by an asterisk have produced
or done work in 1936.

ASBESTOS

NAME OF OPERATOR	ADDRESS	LOCATION OF MINE (Township)
* Asbestos Corporation, Limited.....	Canada Cement Building, Montreal.	Thetford, Coleraine and Broughton
* Bell Asbestos Mines, Limited.....	Thetford Mines.....	Thetford
* Canadian Johns-Manville Co., Ltd.	Asbestos.....	Shipton
* Compagnie d'Amiante de Thetford Ltée (La).....	Thetford Mines.....	Adstock
* Johnson's Company.....	Thetford Mines.....	Coleraine and Thetford
* Lambert, Adolphe.....	Robertsonville.....	Coleraine
* Nicolet Asbestos Mines, Limited...	c/o Greenshields & Greenshields, 820 Transportation Building, Montreal	Tingwick
* Poirier, Ernest.....	Thetford Mines.....	Ireland
* Quebec Asbestos Corporation.....	East Broughton.....	Broughton
Queen Asbestos, Limited.....	c/o Mr. R. A. Sawyer, Bon Conseil, Drummond Co.....	Cleveland
* Testagouza, Angelo.....	Thetford Mines.....	Thetford

CHROME

NAME OF OPERATOR	ADDRESS	LOCATION OF MINE (Township)
* Abestos Corporation, Limited.....	Canada Cement Building, Montreal.	Coleraine.
Brousseau, Nap.....	Courcelles.....	Garthby.
Colonial Chrome Company, Limited.....	420 Lexington Avenue, New York, N.Y., U.S.A.	Coleraine
Gray, Ernest.....	149 St. Maurice St., Thetford Mines	Coleraine
* Plante, Pantaléon (fils Thomas).....	Sainte-Angèle-de-Mérick, Rimouski Co.	Awantjish
Quebec Asbestos & Chrome Co.....	c/o Laval Fraser, 31 West 95th St., New York, N.Y., U.S.A.	Cleveland
Reed Realities, Limited.....	c/o Mr. H. A. Peverley, 1536 St. Mark Street, Montreal.....	Coleraine
Ross, Frank W.....	67 St. Peter Street, Quebec.....	Coleraine
Victory Chrome Mines, Limited.....	c/o General Trust of Canada, 112 St. James Street, Montreal.....	Garthby

COPPER

NAME OF OPERATOR	ADDRESS	LOCATION OF MINE (Township)
Adsit Mining Corporation (The).....	c/o Noranda Mines Ltd., 2-8 King St. East, Toronto 2, Ont.....	Rouyn
Alamac Mines, Limited.....	1811 Royal Bank Building, Montreal.	Desmeloizes
* Aldermae Copper Corporation, Ltd.	941 Dominion Square Building, Montreal.....	Beauchastel
Alliance Mining Securities, Limited.....	Room 110, 18 Rideau Street, Ottawa Ont.....	Dufresnoy
* Area Mines, Limited.....	Room 1002, 320 Bay Street, Toronto Ont.....	Dufresnoy
* Astoria Rouyn Mines, Limited.....	70 St-Paul St., Quebec.....	Rouyn
Aura Mines, Limited.....	Lorrainville.....	Laverlochère
Bagamac Mines, Limited.....	241 Bay Street, Toronto, Ont.....	Rouyn
Blake-Chibougamau Mining Corp'n.....	c/o Maurice Samson, 71 St. Peter St., Quebec.....	McKenzie and Obalski
Calbee Copper Nickel Synd., Ltd.....	375 Second Avenue, Ottawa, Ont.....	Calumet Island
Carlson Copper Syndicate.....	New Liskeard Ont.....	Dufay
Centre Boischatel Copper Co., Ltd.....	c-o E. D. Ranck, The Coleman Lamp & Stove Co., Ltd., Queen St. East & Davies Ave., Toronto, Ont.....	Beauchastel
Cie Minière VilleMarie-Rouyn (La).....	Ville-Marie, Témiscamingue Co.....	Rouyn

COPPER—Continued

NAME OF OPERATOR	ADDRESS	LOCATION OF MINE (Township)
* Cléricy Consolidated Mines, Ltd.	11-12 Carleton Chambers, 74 Sparks St., Ottawa, Ont.	Cléricy
* Consolidated Copper & Sulphur Co.	Eustis	Ascot
* Consolidated Mining & Smelting Co. of Canada, Limited.	840 Dominion Square Bldg, Montreal	Vauquelin and Pershing
Dufault Lake Mines, Ltd.	4141 St Denis Street, Montreal	Dufresnoy
Dunford Rouyn Mines, Limited.	Room 714, 320 Bay Street, Toronto, Ont.	Rouyn
* Glenwood Mining Co., Limited.	Room 920, Castle Building, Montreal	Rouyn
* Greene-Stabell Mines, Limited.	Canadian Bank of Commerce Building, 25 King Street West, Toronto, Ont.	Dubuisson
Junction Gold & Copper Syndicate.	c/o J. P. Manley, Room 302, 330 Bay Street, Toronto, Ont.	Beauchastel
Lakeside Mines, Limited.	Room 2800, Can. Bank of Commerce Bldg., 25 King Street West, Toronto, Ont.	Rouyn
Mary-Jane Copper-Gold Mines, Ltd.	341 Dominion Square Building, Montreal	Destor
Memphremagog Mining Company.	c/o Geo. E. Smith, R.M.D. No. 2, Mansonville.	Potton
Montbray Rouyn Mines, Limited.	112 Yonge Street, Toronto, Ont.	Montbray
Newbec Mines, Limited.	603 Royal Bank Building, Toronto, Ont.	Dufresnoy
* Noranda Mines, Limited.	804 Royal Bank Building, 2-8 King St. East, Toronto 2, Ont.	Rouyn
* Normetal Mining Corporation, Ltd.	350 Bay Street, Toronto, Ont.	Desmeleizes
* Obalski Mining Corporation.	Suite 205, 25 St. James Street Montreal East.	Obalski, Roy, and McKenzie
* Opemiska Copper Mines, Limited.	25 King Street West, Toronto, Ont.	Levy
Quebec Copper Corporation.	c/o E. D. Ranck, The Coleman Lamp & Stove Co., Ltd., Queen Str. East & Davies Ave., Toronto, Ont.	Duprat
Quemont Mining Corporation, Limited	350 Bay Street, Toronto, Ont.	Rouyn
Rhyolite Rouyn Mines, Limited.	1004 Bank of Hamilton Building, Toronto 2, Ont.	Duprat
Robb-Montbray Mines, Limited.	Room 1001, 85 Richmond Street West, Toronto, Ont.	Montbray
* Syndicat d'Exploration Minière de la Rivière Mistassini Enrg.	c/o Pierre Doucet, Girardville	
Turtle Lake Mining Company.	c/o J. A. Parent, 193 Main Street, Hull	Dufay
United Copper Syndicate, Limited.	130 Coristine Building, Montreal	Beauchastel
* Ventures, Limited.	Canadian Bank of Commerce Building, 25 King Street West, Toronto, Ont.	Dufresnoy
* Waite-Amulet Mines, Limited.	804 Royal Bank Building, 2-8 King St. East, Toronto, Ont.	Duprat and Dufresnoy
Wasamac Mines, Limited.	4141 St. Denis Street, Montreal	Beauchastel

FELDSPAR

NAME OF OPERATOR	ADDRESS	LOCATION OF MINE (Township)
Bertrand, Wilfrid	Buckingham	Derry
Blais (Nap.) & Arbic (Phrase)	c/o Phrase Arbic, Mont-Laurier	Campbell
Brazeau, Maurice A.	Buckingham	Portland West
Buckingham Feldspar Company (The)	c/o E. S. Higginson, P.O. Box 54, Buckingham	Derry
* Cameron, D. A. & W. A.	Buckingham	Portland West
Canadian Amber Mica Company.	c/o A. D. MacPherson, Manager, 3542 Vendome Avenue, Montreal	Portland West
* Canadian Flint & Spar Co., Limited	900 Victoria Building, Ottawa, Ont.	Derry
Derry Mining Company.	Buckingham	Derry
Donaldson, Robert J.	Glen Almond	Buckingham
* Evans, W. E.	Buckingham	Buckingham
* Lavolette, Aldeas.	Buckingham	Portland East
McMillan, A. J.	P. O. Box 84, Buckingham	Buckingham
O'Brien & Fowler, Limited.	P. O. Box 340, Buckingham	Derry
* Parcher, Alfred.	Glen Almond	Derry
* Pedneaud, Gonzague.	Glen Almond	Buckingham
* Perkins Mining Company.	P. O. Box 63, Pointe Gatineau	Derry
Sellers (Walter) & Parcher (Alton)	Glen Almond	Derry
Toutloff, Frank	Pointe Gatineau	Portland East
Wallingford, Arthur.	Pointe Gatineau	Buckingham
Whitfield, T.	Buckingham	Buckingham
* Winning, Bush.	Notre-Dame-de-la-Salette	Portland West and Wells

GARNET

NAME OF OPERATOR	ADDRESS	LOCATION OF MINE (Township)
* La Belle Mining, Incorporated.....	c/o Mr. Victor Levesque, 4203 Brebeuf Street, Montreal.....	Joly
Langlade Garnet, Limited.....	90 St. Peter Street, Quebec.....	Beaudin and Trévet
McLean-McNicol, Limited.....	Bell Telephone Building, Beaver Hall Hill, Montreal.....	Joly

GAS and OIL

NAME OF OPERATOR	ADDRESS	LOCATION OF HOLDING
Cartier Natural Gas Company, Ltd. . . .	167 Main Street, Hull.....	
Minéraux et Pétroles de Gaspé Compagnie, Ltée.....	St-Joachim-de-Tourelle, Gaspé Co. . . .	Baie de Gaspé-Nord tp.
Trinidad Mines, Gas & Oil, Limited.....	116 Côte de la Montagne, Que.....	Lanoraie

GOLD

NAME OF OPERATOR	ADDRESS	LOCATION OF MINE (Township)
Abbeville Gold Mines, Limited.....	388 St. James Street West, Montreal.	Rouyn
Abitibi-Or, Limitée.....	c/o Messrs. Mercier, Blain & Fautoux, 132 St. James Street W., Montreal..	Manneville
Acme Cadillac Gold Mines, Ltd.....	Room 116, 276 St. James Street West, Montreal.....	Cadillac
* Adanac Gold Syndicate.....	c/o Wm. E. Smith, 601 Northern Ontario Building, 330 Bay Street, Toronto, 2, Ont.....	Rouyn
Adanac-Quebec Mines, Limited.....	330 Bay Street, Toronto, Ont.....	Rouyn
* Adeline Lake Gold Mines, Limited.....	2408 Stanley Street, Niagara Falls, Ont.....	Beauchastel
* Admiral Cadillac Gold Mines, Ltd. . .	100 Adelaide St. West, Toronto, Ont....	Cadillac
Afton Mines, Limited.....	Room 403, 217 Bay St., Toronto, Ont.	Malartic
* Agaura Explorations, Limited.....	c/o Royal Trust Company, Montreal.....	Montbray
Algray Mines, Limited.....	Room 401, 68 King Street East, Toronto 2, Ont.....	Beauchastel
Amity Gold Mines, Limited.....	Room 629, 67 Yonge Street, Toronto, Ont.....	Bourlamaque and Dubuisson
* Amun Gold Mines, Limited.....	1306 Star Building, 80 King Street West, Toronto, Ont.....	Cadillac
* Amos-Cadillac Gold Mines, Limited.....	Room 303, 330 Bay Street, Toronto Ont.....	Bousquet
Amos-Duverny Gold Mines, Limited.....	c/o E. O. Freedman, 10 Ontario Street West, Montreal.....	Duverny
Amos Mining Company, Limited.....	Room 304, 1410 Stanley Street, Montreal.....	Dalquier
Amphi Gold Syndicate.....	c/o Messrs Fennell, Porter & Davis, 357 Bay Street, Toronto, Ont.....	Malartic
Amulet-Montgomery (Syndicat).....	4141 St. Denis Street, Montreal.....	Beauchastel
Anglo-Canada Mineral Explorers.....	276 St. James Street, Montreal.....	Duparquet
* Ardmore Properties, Limited.....	Room 710, 36 Toronto Street, Toronto, Ont.....	Desjardins
* Arncœur Gold Mines, Limited.....	159 Bay Street, Toronto, Ont.....	Dasserat
* Arno Mines, Limited.....	63 Sparks Street, Ottawa, Ont.....	Rouyn
* Arntfield Gold Mines, Limited.....	159 Bay Street, Toronto, Ont.....	Beauchastel
* Arrowhead Gold Mines, Limited.....	240 St. James Street West, Montreal.....	Joannes
* Ascot Gold Mines, Limited.....	357 Bay Street, Toronto, Ont.....	Malartic
Athlone Gold Mines, Limited.....	388 St. James Street West, Montreal.....	Bousquet
Aurac Mines, Limited.....	165 St. John Street, Montreal.....	Bourlamaque
Austin Rouyn Gold Mines, Limited.....	21 King Street East, Toronto, Ont.....	Rouyn
Avocalon Extension Syndicate, Ltd.....	Room 1701, 372 Bay Street, Toronto, Ont.....	Vauquelin
* Avocalon Mining Syndicate, Ltd.....	428 Bank of Hamilton Building, 67 Yonge Street, Toronto, Ont.....	Vauquelin
Balmoral Gold Mining Syndicate.....	Jackson Building, 243 Slater Street, Ottawa, Ont.....	Guillet
Bapoma Bousquet Gold Mines, Ltd.....	407 McGill Street, Montreal.....	Bousquet
* Barraute (Syndicat Minier de).....	c/o L. C. Dumais, 161 Fourth Ave., Quebec.....	Barraute
Barraute Mining Company, Limited.....	1074 Beaver Hall Hill, Montreal.....	Barraute
Barry Lake Gold Mines, Limited.....	c/o Savard & Savard, 126 St. Peter Street, Quebec.....	Barry
* Basin Gold Mining Corporation.....	437 St. James Street West, Montreal.....	Dubuisson
Bayside Malartic Mines, Limited.....	c/o Coughlin & Coughlin, 231 St. James Street West, Montreal.....	Malartic

GOLD—Continued

NAME OF OPERATOR	ADDRESS	LOCATION OF MINE (Township)
* Beattie Gold Mines, Limited.....	Canadian Bank of Commerce Bld'g., 25 King Street West, Toronto, Ont.	Duparquet
Beattie Mining Company, Limited.....	Noranda.....	Duparquet
* Beaucourt Gold Mines, Ltée.....	1604 Aldred Building, Montreal.....	Louvicourt
* Beaufor Mining Corporation.....	P. O. Box 134, Montreal.....	Pascalis and Louvicourt
Beauplace Mines, Limited.....	15 King Street West, Toronto, Ont.....	Guillet
* Belgo-Canadienne de Prospection Minière, Limitée (Compagnie).....	417 St. Peter Street, Montreal.....	Duparquet
* Belleterre Mines, Limited.....	15 King Street West, Toronto, 2, Ont.	Guillet
* Bell River Gold Mines, Limited.....	204 Hospital Street, Montreal.....	Louvicourt
Bern Martyn Prospecting Co., Ltd.....	New Liskeard, Ont.....	McCorkill
* Bickleigh Mining Company, Ltd.....	Rooms 603-4, 2-8 King Street East, Toronto 2, Ont.....	Dasserat
* Bidlamaque Gold Mines, Limited..	713 Canada Permanent Building, 320 Bay Street, Toronto, Ont.....	Bourlamaque.....
Big Bend Mining Corporation, Limited	c/o W. J. Hosking, Rouyn.....	Joannes
Big Four Mining Syndicate, Limited..	464 St. François-Xavier Street, Mont- real.....	Destor and Duparquet
Blouin Lake Gold Mines, Limited....	516-517 Canada Cement Building, Montreal.....	Bourlamaque
Bouchard Cléricy Gold Mines, Limited	715 Metropolitan Building, Toronto, Ont.....	Cléricy
* Bourbeau Lake Chibougamau Mines, Ltd.....	New Liskeard, Ont.....	McKenzie
* Bourlamaque Gold Mines, Limited..	726 Insurance Exchange Building, Montreal.....	Bourlamaque
* Bouscadillac Gold Mines, Limited..	1116 Federal Building, Toronto, Ont..	Bousquet
Bowes Gold Mines, Limited.....	Rouyn.....	Rouyn
Brooke Cadillac Gold Mines, Limited..	Room 1, 400 St. James Street West Montreal.....	Cadillac
* Brown Bousquet Mines, Limited....	437 St. James Street West, Montreal..	Cadillac
Brownlee Mines (1936), Limited.....	215 Bay Street, Toronto, Ont.....	Rouyn
* Brueil Gold Syndicate, Limited.....	Room 302, 330 Bay Street, Toronto, Ont.....	Vauquelin
Burwell Gold Mines, Limited.....	231 St. James Street, Montreal.....	Varsan.
* Cache Lake Chibougamau Mines, Limited.....	132 St. James Street West, Montreal..	Obalski
Cadillac Goldfields, Limited.....	726 Insurance Exchange Building, Montreal.....	Cadillac
Calder-Bousquet Gold Mines, Limited..	Room 706, 100 Adelaide Street West, Toronto, Ont.....	Bousquet
Caledonia Cadillac Gold Mines, Lim- ited.....	276 St. James Street West, Montreal..	Bousquet
Canadian Cadillac Gold Mines, Lim- ited.....	276 St. James Street West, Montreal..	Cadillac
Canadian Gold Hunters.....	Cookshire, Compton Co.....	Laverlochère
* Canadian Malartic Gold Mines, Lim- ited.....	25 King Street West, Toronto, Ont....	Fournière
* Candalaria Gold Mines, Limited....	18 Toronto Street, Toronto, Ont.....	Cadillac
* Capital Rouyn Gold Mines, Limited..	301 First Avenue, Ottawa, Ont.....	McKenzie
* Capital Traders, Limited.....	276 St. James Street, Montreal.....	McKenzie
* Cassels Chibougamau Mines, Lim- ited.....	45 Rideau Street, Ottawa, Ont.....	Obalski
Cassels Duval Mines, Limited.....	244 St. James Street, Montreal.....	Bousquet
Cavalier Cadillac Gold Mines, Limited..	c/o Messrs. Taschereau, Parent, Tas- chereau & Cannon, 70 St. Paul St., Quebec.....	Cadillac
* Celta Development & Mining Com- pany, Ltd.....	465 St. John Street, Montreal.....	Senneville
* Central Cadillac Gold Mines, Lim- ited.....	720 Transportation Building, Montreal	Cadillac
* Central Chibougamau Gold Mines, Limited.....	Room 405, 276 St. James Street West, Montreal.....	McKenzie
Central Duverny Gold Mines, Lim- ited.....	c/o S. J. Smiley, Canada Cement Building, Montreal.....	Duverny
* Central Gold Mines, Limited.....	Picton, Ont.....	Dasserat
Central Louvicourt Gold Mines, Lim- ited.....	c/o G. N. Clermont, 5363 St. Denis St., Montreal.....	Louvicourt
Central Malartic Mines, Limited....	c/o E. T. Garner, 512 Jarvis Street, Toronto, Ont.....	Malartic
* Centrecoeur Gold Mines, Limited..	405 Atlas Building, Toronto, Ont.....	Louvicourt
Centremaque Gold Mines, Limited....	Suite 118, 276 St. James Street, Mont- real.....	Bourlamaque
Century Mining Corporation, Limited..	454 St. François-Xavier Street, Mont- real.....	Cadillac

GOLD—Continued

NAME OF OPERATOR	ADDRESS	LOCATION OF MINE (Township)
* Ceres Explorations, Limited.....	85 Sparks Street, Ottawa, Ont.....	Beauchastel
* Chadbourne Development Co., Limited.....	c/o Gerald A. McTeigue, 720 Transportation Building, Montreal.....	Rouyn
Chaput Gold Syndicate.....	210 Crown Office Building, 26 Queen St. East, Toronto, Ont.....	Pershing
* Chibmac Mines, Limited.....	132 St. James Street West, Montreal.....	Beauchastel
Chibougamau North Gold Mining Corporation.....	c/o G. D. Kelly, 17 Ste-Geneviève Ave., Quebec.....	McKenzie
* Chibougamau Properties, Limited.....	132 St. James Street West, Montreal.....	Obalski
Chibougamau Proulx Bay Gold Mine, Ltd. (The).....	Chambord Junction.....	McKenzie...
* Christie Mining Syndicate, Inc.....	4219 West Hill Ave., Montreal.....	Christie
* Churchill Mining & Milling Co., Limited.....	Central Building, 45 Richmond St. West, Toronto, Ont.....	Cadillac
Cie Petosa Roy Tungstene Premier (La).....	Guigues, Témiscamingue Co.....	Gaboury
Claveryn Gold Mines, Limited.....	Transportation Building, Montreal.....	Duverny
* Clerno Mines, Limited.....	74 Sparks Street, Ottawa, Ont.....	Rouyn
Colonial Gold Mines, Limited.....	Suite 1101, Castle Building, Montreal.....	Dalquier
Commander Mines, Limited.....	705 Northern Ontario Building, Toronto, Ont.....	Duverny
* Compagnie Minière Franco-Canadienne, Ltée (La).....	Amos (Abitibi).....	Duverny
* Consolidated Chibougamau Goldfields, Ltd.....	401 Can. Pacific Express Building, 215 St. James St., Montreal.....	McKenzie and Obalski
Continental Explorations, Limited.....	726 Insurance Exchange Building, Montreal.....	Dasserat
Coronation Cadillac Gold Mines, Limited.....	806 Northern Ontario Building, Toronto, Ont.....	Cadillac
Cournor Mining Company, Limited.....	Room 10, 215 St. James Street West, Montreal.....	Louvicourt
Courvak Gold Mines, Limited.....	407 McGill Street, Montreal.....	Louvicourt
Crossroads Gold Mines, Limited.....	Room 215, 159 Bay Street, Toronto, Ont.....	Dubuisson
Crow River Mines, Limited.....	63 Sparks Street, Ottawa, Ont.....	Rouyn
Cummings-Trudel Mining & Development Co., Ltd.....	Room 300, Victoria Building, Ottawa, Ont.....	Barraute
Dalquier Mining Syndicate.....	18 Toronto Street, Toronto, Ont.....	Vauquelin
Dasserat Rouyn Goldfields, Limited.....	129 Cooper Street, Ottawa, Ont.....	Rouyn
Daubree Gold Mines, Limited.....	407 McGill Street, Montreal.....	Daubree
David Mines, Limited.....	Room 720, 132 St. James Street, Montreal.....	Beauchastel
* Deane-Cadillac Mining Corporation.....	276 St. James Street West, Montreal.....	Malartic
Delandore Mines, Limited.....	350 Bay Street, Toronto, Ont.....	Delestre
* Dempsey-Cadillac Gold Mines, Limited.....	1008 Royal Building, Toronto, Ont.....	Cadillac
* Descar Corporation, Limited.....	231 St. James Street, Montreal.....	Destor
* Dileas Syndicate.....	c/o C. E. Bent, Noranda.....	Dasserat
* Dion, Georges A.....	19 St. Etienne Street, Lauzon.....	Watford
* Donchester Mines, Limited.....	c/o Ventures, Limited, 25 King Street West, Toronto, Ont.....	Duparquet
Donwell Gold, Limited.....	509 Federal Building, Toronto, Ont.....	Hébécourt
Doramer Mining Company, Limited.....	Room 718, Price Building, Quebec.....	Joannes
* Doreva Gold Mines, Limited.....	809 Northern Ontario Building, Toronto, Ont.....	Bousquet
Dorex Gold Mines, Limited.....	330 Bay Street, Toronto, Ont.....	Bousquet
D'Orrount Gold Mines, Limited.....	c/o E. A. R. Newson, 330 Bay Street, Toronto, Ont.....	Pershing
Dorosa Gold Mines, Limited.....	c/o Gravel, Thompson & Hearn, 65 Ste-Anne Street, Quebec.....	Rouyn and Beauchastel
* Dorrington Mining Syndicate.....	2408 Stanley Street, Niagara Falls, Ont.....	Beauchastel
* Dorval-Siseoc Mines, Limited.....	Val d'Or.....	Varsan
Dranfield Mining Company, Limited.....	9 Toronto Street, Toronto, Ont.....	Rouyn
* Dubuisson Goldfields, Limited.....	726 Insurance Exchange Building, Montreal.....	Dubuisson
Dubuisson Gold Mining Co., Ltd (The).....	Pine Street, Timmins, Ont.....	Dubuisson
* Dubuisson Mines, Limited.....	517 Canada Cement Building, Montreal.....	Bousquet
* Dubuque Mines, Limited.....	Timmins, Ont.....	Dubuisson
Dugoss Mines, Limited.....	168 Pitt Street, Cornwall, Ont.....	Duparquet
Dumico Gold Corporation.....	201 Hospital Street, Montreal.....	Duparquet

GOLD—Continued

NAME OF OPERATOR	ADDRESS	LOCATION OF MINE (Township)
Dunlop Consolidated Mines, Limited.	503 General Assurance Building, 357 Bay Street, Toronto 2, Ont.	Louvicourt
* Duquesne Mines, Limited.	80 King Street West, Toronto, Ont.	Duparquet and Destor
* Durbar Gold Mines, Limited.	Box B, Edgewood, Rhode Island, U.S.A.	Rouyn
Duver Creek Gold Mines, Limited.	Room 316, Canada Cement Building, Montreal.	Duverny
Duverny Consolidated Gold Mines, Inc.	Room 316, Canada Cement Building, Montreal.	Duverny
Duverny Goldfields Corporation.	c/o Leopold Choquette, 60 St. James Street West, Montreal.	Duverny
* East Bay Gold, Limited.	P. O. Box 456, Noranda.	Rouyn
* East Cadillac Syndicate, Limited.	Room 720, 132 St. James Street West, Montreal.	Cadillac.
East Lamaque Gold Mines, Limited.	504 General Assurance Building, Bay & Temperance Streets, Toronto, Ont.	Bourlamaque
* East Malartic Mines, Limited.	913 Royal Bank Building, Montreal.	Fournière
East Rouyn Gold Mines, Limited.	c/o Holden, Murdock, Walton & Beatty, 2-8 King Street East, Toronto 2, Ont.	Rouyn
* Eastwest Exploration Company, Limited.	Room 809, Lewis Building, 465 St. John Street, Montreal.	Bourlamaque
Eclipse Gold Mining Company, Limited.	Sixth Floor, 201 Notre-Dame Street West, Montreal.	Destor
* Embergold Mines, Limited.	956 New Birks Building, Montreal.	Ditton
* Emperor Gold Syndicate, Limited.	c/o Fennell, Porter & Davis, General Assurance Building, Toronto, Ont.	Bartouille, Ducross and Rochebaucourt
* Erie Canadian Mines, Limited.	Kirkland Lake, Ont.	Varsan
Eudo Gold Mines, Limited.	Rouyn.	Gillet
* Farrell-Rouyn Mines, Limited.	Canadian Bank of Commerce Building, 25 King Street West, Toronto, Ont.	Rouyn
Flavrian Gold Mines, Limited.	Noranda.	Duprat
* Fleming Mines, Limited.	Room 515, 215 St. James Street West, Montreal.	Louvicourt
Fleming-Thompson Gold Mines, Limited.	1305 Star Building, Toronto, Ont.	Duparquet
* Fleury Chibougamau Exploration Syndicate.	c/o Philémon Vallières, 8 Sault-au-Matlot, Quebec.	Roy
Flobec Gold Mines, Limited.	347 Bay Street, Toronto, Ont.	Franquet and Desjardins
* Florence River (Quebec) Gold Mines, Ltd.	Room, 510, 320 Bay Street, Toronto, Ont.	Desjardins
* Fontana Gold Mines, Limited.	Room 1022, Transportation Building, Montreal.	Duverny
Ford Cadillac Gold Mines, Limited.	c/o Lafleur, Fortier & Latulippe, 507 Place d'Armes, Montreal.	Cadillac
* Francoeur Gold Mines, Limited.	941 Dominion Square Building, Montreal.	Beauchastel
* Freegold Mines, Limited.	Suite 100, 45 St. James Street West, Montreal.	Launay
* Gale Gold Mines, Limited.	459 Ouellette Avenue, Windsor, Ont.	Dubuisson
Gariepy Gold Mining, Limited.	454 Jacques-Cartier Square, Montreal.	Obalski
* Garth Chiboug Gold Syndicate, Limited.	320 Bay Street, Toronto, Ont.	McKenzie
Gignac Gold Mines, Limited.	402 Perrault Street, Rouyn.	Dasserat
* Gilbec Mines, Limited.	200 Bay Street, Toronto 2, Ont.	Pascalis
Gladstone Gold Mines, Limited.	132 St. James Street West, Montreal.	Pershing
Gold Bar Mines, Limited.	204 Royal Bank Building, Toronto 2, Ont.	Rouyn and Beauchastel
* Golden Manitou Syndicate.	c/o Hon. W. H. Sharpe, Senate Chambers, Ottawa, Ont.	Bourlamaque
* Golden Road Mine, Limited.	341 Dominion Square Building, Montreal.	Rouyn
* Gold Mining Claims, Limited.	906 Transportation Building, 132 St. James Street West, Montreal.	Duverny
* Gold Quartz Mining Corporation, Limited.	26 Queen Street East, Toronto, Ont.	Courville
Gold River Mining Company, Limited.	956 New Birks Building, Montreal.	Ditton
Goldstream Mining Co., Limited.	9 Toronto Street, Toronto, Ont.	Rouyn
* Gold Valley Mines, Limited.	341 Dominion Square Building, Montreal.	Rouyn
Goyette, A. E.	4141 St. Denis Street, Montreal.	Seignory of Rigaud, Vaudreuil
* Granada Gold Mines, Limited.	244 Bay Street, Toronto Ont.	Rouyn
Granby-Kent Mines, Limited.	c/o René Chênevert, 276 St. James Street West, Montreal.	Varsan

GOLD—Continued

NAME OF OPERATOR	ADDRESS	LOCATION OF MINE (Township)
* Greene-Stabell Mines, Limited.....	Canadian Bank of Commerce Building, 25 King Street West, Toronto, Ont.	Dubuisson
Grenadier Gold Mines, Limited.....	201 Mackinnon Building, Toronto, Ont.	Duverny
Grenfell Goldfields, Limited.....	419-A Insurance Exchange Building, 276 St. James Street West, Montreal.	Brongniart
Gunard Gold Mine, Limited.....	111 Bagshaw Street, Rouyn.....	Beauchastel
* Halliwell Gold Mines, Limited.....	360 St. James Street West, Montreal..	Beauchastel
Harpers Malartic Gold Mines, Limited	357 Bay Street, Toronto, Ont.....	Dubuisson
* Harricana Almagamated Mines, Inc. (The).....	220 Grande Allee, Quebec.....	Louvicourt
* Harricana Basin Mining Company..	Amos (Abitibi).....	
Harris Bousquet Gold Mines, Limited.	Suite 716, 276 St. James Street West, Montreal.....	Bousquet
Havelock Development Company, Limited.....	407 McGill Street, Montreal.....	Beauchastel
* Hayes Cadillac Mines, Limited.....	18 Toronto Street, Toronto, Ont.....	Cadillac
Higginson Gold Mines, Limited.....	407 McGill Street, Montreal.....	Varsan
Higg-Varsan Syndicate.....	Room 1306, 80 King Street West, To- ronto, Ont.....	Varsan
Hollinger Exploration Co., Limited...	Timmins, Ont.....	Desjardins
Inre-Gold Prospectors, Limited.....	289 Perrault Street, Rouyn.....	Rouyn
* Inspiration Mining and Development Co., Limited.....	Amos (Abitibi).....	McKenzie
Iris Gold Mines, Limited.....	c/o M. G. Hunt, Se'y, Kirkland Lake, Ont.....	Guillet
Iroquois Gold Mining, Limited.....	Room 54, 152 Notre-Dame Street East, Montreal.....	Opemisca
* Jacola Mines, Limited.....	25 King Street West, Toronto, Ont...	Dubuisson
* Jacques Cartier Mining Corp'n.....	Room 715, 215 St. James Street West, Montreal.....	Bourlamaque
James Patrice Gold Mines, Limited (The).....	Rouyn.....	Guérin
Joannes-Davidson Mines, Limited....	276 St. James Street West, Montreal..	Joannes
Joannes Gold Mines, Limited.....	New Liskeard, Ont.....	Bousquet
Jubilee Gold Exploration Syndicate, Ltd.....	445 St. François-Xavier Street, Mont- real.....	Varsan
* Jupiter Gold Syndicate, Limited....	601 Northern Ontario Building, To- ronto, Ont.....	Rouyn
Kanasuta Gold Mines, Limited.....	616 Confederation Life Building, 12 Richmond Street East, Toronto, Ont	Duparquet
Karas Gold Mines, Limited.....	706 Confederation Life Building, To- ronto, Ont.....	Dasserat
Kegamjone Development and Mining Co., Ltd.....	c/o Capital Traders Limited, Room 402, 276 St. James Street, Montreal.	McKenzie
KeKeKo Gold Mines, Limited.....	Arntfield, Témiscamingue Co.....	Beauchastel
* Keyroe Gold Mining Company, Lim- ited.....	Suite 605, 244 Bay Street, Toronto 2, Ont.....	Rouyn
* Kewagama Gold Mines, Limited....	25 King Street West, Toronto, Ont....	Cadillac
Kiask Falls Mining Company, Limited	330 Bay Street, Toronto, Ont.....	Tonnancourt and Laas
* Kiema Gold Mines, Limited.....	Room 1401, 302 Bay Street, Toronto, Ont.....	Dubuisson
* Kindale Mines, Limited.....	217 University Tower, Montreal.....	Rouyn
Kinghorn Sturgeon Mines, Limited....	357 Bay Street, Toronto, Ont.....	Bourlamaque
* Kirkland-Hudson Bay Gold Mines, Ltd.....	New Liskeard, Ont.....	Blondeau and Guillet
Kirmaque Gold Mines, Limited.....	364 Bay Street, Toronto, Ont.....	Bourlamaque
Kongor Mines Corporation.....	625 Burnside Place, Montreal.....	Dalquier
Kotter Gold, Limited.....	c/o D. B. Mulholland, 330 Bay Street, Toronto, Ont.....	Lavergne
Lacoma Gold Mine, Limited.....	Room 1701, 372 Bay Street, Toronto, Ont.....	Tavernier
Lac Varsan Gold Mines, Limited.....	507 Place d'Armes, Montreal.....	Varsan
Lago Gold Mines, Limited.....	187 Main Street, Hull.....	Beauchastel
* Lake Dasserat Mines, Limited.....	350 Bay Street, Toronto, Ont.....	Dasserat
Lake Dore Mines, Limited.....	414 St. James Street West, Montreal..	Obalski
* Lake Expanse Gold Mines, Limited	Room 510, 320 Bay Street, Toronto, Ont.....	Guillet
Lake Fortune Gold Mines, Limited...	941 Dominion Square Building, Mont- real.....	Beauchastel
Lake Larone Gold Mines, Limited.....	Chicoutimi.....	McKenzie
Lake Montigny Gold Mines, Limited...	276 St. James Street West, Montreal..	Varsan
* Lake Rose Mines, Limited.....	12th Floor, 80 King Street West, To- ronto, Ont.....	Currie

GOLD—Continued

NAME OF OPERATOR	ADDRESS	LOCATION OF MINE (Township)
Lakman Gold Mines, Limited.....	26 Adelaide Street West, Toronto, Ont.	Tiblemont
* Lamaque Contact Gold Mines, Limited.....	357 Bay Street, Toronto, Ont.....	Bourlamaque
Lamaque Gold Mines, Limited.....	Bourlamaque, Abitibi Co.....	Bourlamaque
Mine du Lac, Limitée (La).....	Notre-Dame du Lac.....	
Landor Gold Mines, Limited.....	221 Notre-Dame Street West, Montreal.....	Varsan
Landry Mines, Limitée.....	Mont-Joli.....	Seigniory of Aubin de L'Île
* Lapa Cadillac Gold Mines, Limited.....	25 King Street West, Toronto, Ont.....	Cadillac
* La Pauze Gold Mining Corporation, Ltd.....	5660 Park Avenue, Montreal.....	La Pauze
Laquerre Development Company, Limited.....	407 McGill Street, Montreal.....	Duprat
* La Reine Gold Mines, Limited.....	314 C.P.R. Building, Toronto, Ont.....	La Reine
La Roc Mines, Limited.....	132 St. James Street West, Montreal.....	Vauquelin
La Rose-Rouyn Mines, Limited.....	112 Yonge Street, Toronto 2, Ont.....	Rouyn
Lartie Mines, Limited.....	c/o Holden & Murdoch, Suite 603-4, 2-8 King Street, Toronto 2, Ont.....	Malartic
L. B. United Mines, Limited.....	767 Yonge Street, Toronto, Ont.....	Tiblemont
* La Salle Gold Mines, Limited.....	930 Clarke Street, Montreal.....	Malartic
* La Sarre Gold Mines, Limited.....	314, C.P.R. Building, Toronto, Ont.....	La Sarre
Lavalie Mines (Quebec), Limited.....	Room 202, 465 St. John Street, Montreal.....	Bourlamaque
* Legault Gold Mines, Limited.....	1604 Aldred Building, 507 Place d'Armes, Montreal.....	Dubuisson
* LeRoy Mines, Limited.....	266 St. James Street West, Montreal.....	Guillet
Letondal Gold and Copper Syndicate.....	2130 Laforce Street, Montreal.....	Letondal
Locarno Gold Mines, Limited.....	18 Rideau Street, Ottawa, Ont.....	Clérycy
Louvest Gold Mines, Limited.....	Suite 702, 407 McGill Street, Montreal.....	Louvicourt and Cadillac
Louvicourt Mines, Limited.....	Room 1001, 85 Richmond Street West, Toronto, Ont.....	Louvicourt
* Louvre Gold Mines, Limited.....	407 McGill Street, Montreal.....	Louvicourt
* MacDonald Gold Mines, Limited.....	P. O. Box 247, Elmira, Ont.....	Duparquet
MacDonald Mines, Limited.....	132 St. James Street West, Montreal.....	Dufresnoy
McDonough Mining Syndicate, Ltd.....	67 Yonge Street, Toronto, Ont.....	Vauquelin
* McIntyre-Porcupine Mines, Limited.....	15 King Street West, Toronto, Ont.....	Dasserat
* McKay (Quebec) Exploration, Ltd.....	401 Canadian Pacific Express Building, 215 St. James Street West, Montreal.....	Scott and Obalski
* McRae Gold Mines, Limited.....	1606 Aldred Building, Montreal.....	Senneville
* McWatters Gold Mines, Limited.....	Box 689, Rouyn.....	Rouyn
Macaboug Exploration, Limited.....	518 Continental Life Building, Toronto Ont.....	McKenzie and Scott
Macaboug Gold Mines, Limited.....	371 Bay Street, Toronto, Ont.....	McKenzie and Scott
Magold Gold Mines Corporation.....	c/o Eugene Gagnon, 116 Short Street, Sherbrooke.....	Ascot
Mainland Chibougamau Mines, Ltd.....	132 St. James Street West, Montreal.....	Obalski
* Malartic Gold Fields, Limited.....	Room 824, 25 Royal Bank Building, Montreal.....	Malartic
*Malartic Lakeshore Mines, Limited.....	Room 221, 276 St. James Street West, Montreal.....	Malartic
Malrobic Mines, Limited.....	36 Toronto Street, Toronto 2, Ont.....	Malartic
Manitoba Basin Mining Co., Limited.....	220 Bay Street, Toronto, Ont.....	Desjardins
Manley Quebec Gold Mines, Limited.....	Room 703, 357 Bay Street, Toronto, Ont.....	La Reine
Mardamac Canadian Exploration.....	21 Richmond Street West, Toronto, Ont.....	Beauchastel
Marillac Mining Syndicate, Limited.....	c/o Lloyd A. Bissell, 55 Ossington Ave., Ottawa, Ont.....	Joannes
* Maritime Cadillac Gold Mines, Ltd.....	330 Bay Street, Toronto, Ont.....	Cadillac
Marva Gold Mines, Limited.....	357 Bay Street, Toronto, Ont.....	Bousquet
* Matchi-Manitou, Ltée, (Syndicat des Mines d'Or).....	c/o J. H. Paré, 220 Grande Allée, Que- bec.....	Vauquelin and Pershing
* Mega Mining Syndicate (The).....	c/o Alex. Gagnon, 55 Scott Street, Quebec.....	Whitton
Mentor Exploration and Development Co., Limited.....	Canadian Bank of Commerce Building, 25 King Street West, Toronto 2, Ont. c/o W. B. McHenry, 217 Bay Street, Toronto, Ont.....	Rouyn
Mervyn Malartic Gold Mines, Limited.....	Toronto, Ont.....	Malartic
Met-Mac Prospectors, Limited.....	Suite 701, 407 McGill Street, Montreal.....	Louvicourt
* Midcour Prospectors, Limited.....	c/o F. H. Todd, Cobalt, Ont.....	Louvicourt
* Midland Mining Corporation, Ltd.....	31 St. James Street, Montreal.....	Desmeloizes
Midway Malartic (Quebec), Limited.....	187 Main Street, Hull.....	Fournière
Minelands, Limited.....	Arnfield.....	Beauchastel
Mine d'Or Vénus Consolidée (La).....	108 des Commissaires Street, Quebec.....	Barraute
* Mines Development Corporation.....	189 St. John Street, Quebec.....	Landrienne

GOLD—Continued

NAME OF OPERATOR	ADDRESS	LOCATION OF MINE (Township)
Mines d'Or de Laverlochère, Limitée.	c/o Horace Bédard, St. Eugène de Guigues.	
Mines d'Or Provencher, Limitée.	Rouyn.	Dasserat and Beauchastel
* Minseeker Forgold, Limited.	Rouyn.	Rouyn
Mines Holdings, Limited.	132 St. James Street West, Montreal.	Varsan
* Mines Operating Corporation.	407 McGill Street, Montreal.	Cadillac
* Mining Corporation of Canada, Ltd.	350 Bay Street, Toronto, Ont.	McKenzie
* Mining Enterprises, Limited.	Room 206, 1405 Bishop St., Montreal.	Malartic
Miska Mining Company, Limited.	Room 629, Bank of Hamilton Building, Toronto, Ont.	Levy
* Monarch Mines, Limited.	Suite 1209, 330 Bay Street, Toronto, Ont.	Dasserat
* Mooshla Gold Mines Co., Limited.	25 King Street West, Toronto, Ont.	Bousquet
Mud Lake Gold Mines, Limited.	302 Sterling Tower, Toronto, Ont.	Guillet
* Mylamaque Gold Mines, Limited.	10 Adelaide Street East, Toronto, Ont.	Bourlamaque
Natagan Gold Mines Syndicate, Ltd.	c/o A. P. Robitaille, Charlesbourg.	Malartic
Newbec Mines, Limited.	603 Royal Bank Building, Toronto, Ont.	Dufresnoy
New Ribago, Limited.	Room 426, 32 Bank of Hamilton Building, Toronto, Ont.	Beauchastel
Nipissing Mining Company, Limited.	Excelsior Life Building, Toronto, Ont.	Guillet
* Noranda Mines, Limited.	804 Royal Bank Building, Toronto, Ont.	Rouyn
Norbeau Mines, Limited.	Noranda.	McKenzie
Norbell Gold Mines, Limited.	171 Yonge Street, Toronto, Ont.	Tiblmont
Norfield Mines, Limited.	Suite 117-119, Ottawa Electric Building, Ottawa, Ont.	Beauchastel
* Norgold Mines, Limited.	2529 Canadian Bank of Commerce Building, 25 King Street West, Toronto 2, Ont.	Rousquet
Norlake Mining Corporation.	902 Castle Building, Montreal.	McKenzie
Northern Mining Syndicate, Limited.	Room 302, 330 Bay Street, Toronto, Ont.	Dufresnoy
Northern Chibougamau Mines, Ltd.	460 St. François-Xavier Street, Montreal.	McKenzie
* Northern Quebec Gold Fields & Exploration Company.	Trois-Rivières.	Joannes and Duparquet
* North King Gold Syndicate.	Room 222, 1 Toronto Street, Toronto, Ont.	Haig
North Tiblmont Gold Mines, Limited.	Insurance Exchange Building, 18 Toronto Street, Toronto, Ont.	Tiblmont
* Nortrae Mining Company, Limited.	210 St. James Street West, Montreal.	Dalquier
* Nubell Gold Mines, Limited.	Room 513, 215 St. James Street West, Montreal.	Clérier, Louvicourt and Vauquelin
* Numaque Mining Company.	465 St. John Street, Montreal.	Bourlamaque
* O'Brien Gold Mines, Limited.	Kewagama.	Cadillac
O'Grady Syndicate.	Rouyn.	Beauchastel
O'Hara Gold Mines, Limited.	Suite 814, 231 St. James Street, Montreal.	Senneville
* O'Leary Malartic Mines, Limited.	Rouyn.	Beauchastel and Duprat
* Olympic Cadillac Gold Mines, Ltd.	1112 Star Building, Toronto, Ont.	Cadillac
* O'Neill Thompson Gold Mines, Ltd.	Roxborough Apartments, Ottawa, Ont.	Joannes
Opemiska Mines, Limited.	c/o G. B. Reilly, 167 Main Street, Hull.	Levy
Orcour Gold Mines, Limited.	357 Bay Street, Toronto, Ont.	Louvicourt
Oremonte Mines, Limited.	Room 208, 266 St. James Street West, Montreal.	Dalquier
Orland Gold Mines, Limited.	Room 109, 18 Rideau Street, Ottawa, Ont.	Beauchastel
Osisko Lake Mines, Limited.	c/o H. Whittingham, 100 Adelaide Street, Toronto, Ont.	Rouyn
Osisko Rouyn Exploration Company, Limited.	Room 2800, 25 King Street West, Toronto, Ont.	Rouyn
* Pan-Canadian Gold Mines, Limited.	407 McGill Street, Montreal.	Cadillac
* Pandora Cadillac Gold Mines, Limited.	New Liskeard, Ont.	Cadillac
Paradis Mining Corporation.	1463 Sun Life Building, Montreal.	Pascalis and Louvicourt
Partanen Malartic Gold Mine, Limited.	320 Bay Street, Toronto, Ont.	Malartic
Pascalis Gold Mines, Limited.	Canadian Bank of Commerce Building, 25 King Street West, Toronto, Ont.	Pascalis
* Payore Gold Mines, Limited.	504 General Assurance Building, Bay & Temperance Streets, Toronto, Ont.	Bourlamaque
Pelletier Lake Gold Mines, Limited.	25 King Street West, Toronto, Ont.	Rouyn
Peninsula Mines, Limited.	132 St. James Street West, Montreal.	McKenzie and Obalski
Penn Cadillac Gold Mines, Limited.	c/o Jack Home, 80 St. Peter Street, Quebec.	Cadillac
* Perron Gold Mines, Limited.	Pascalis.	Pascalis
* Pershing Gold Exploration, Limited.	100 Adelaide Street West, Toronto.	Franquet and Pershing

GOLD—Continued

NAME OF OPERATOR	ADDRESS	LOCATION OF MINE (Township)
Pershing Manitou Gold Mines, Limited	c/o J. H. Paré, 220 Grande-Allée, Quebec.....	Pershing
Peter Gladstone McKenzie Mines Development Company, Limited.....	Room 316, 215 St. James Street West, Montreal.....	Scott
* Plaindor Mines Company.....	20 St. James Street East, Montreal...	Cadillac
Pontiac & Abitibi Gold Mines, Limited	c/o J. C. Lamothe, K.C., Suite 204, 25 St. James Street West, Montreal...	Beauchastel
Pontiac Rouyn Mines, Limited.....	Room 706, 100 Adelaide Street, Toronto, Ont.....	Rouyn
* Potter Doal Mines, Limited.....	36 Toronto Street, Toronto, Ont.....	Bourlamaque
* Poulin Mining Company, Limited...	48 Fort St., St-Lambert, Montreal...	Ascot
* Powell Rouyn Gold Mines, Limited.	440 Confederation Life Building, Toronto, Ont.....	Rouyn
Pre-Cambrian Prospectors, Limited...	Rouyn.....	Rouyn
Premier Gold Mining Co., Limited...	Royal Trust Building, Vancouver, B.C.	McKenzie
Primrose Exploration Company, Limited.....	75 Sparks Street, Ottawa, Ont.....	Clérycy
* Prospectors Airways Company, Limited.....	12th Floor, 80 King Street West, Toronto, Ont.....	Guillet, Obalski and McKenzie
Prospects, Limited.....	Val d'Or (Abitibi).....	Varsan
Quebec Consolidated Gold Mines, Limited.....	Room 100, 45 St. James Street West, Montreal.....	Launay
* Quebec Eureka Gold Mines, Limited	30 Adelaide Street West, Toronto, Ont.	Vauquelin
Quebec Gold Belt Mines, Limited.....	P. O. Box 190, Fort Erié, Ont.....	Bourlamaque and Louvicourt
* Quebec Gold Mining Corporation...	Suite 110, 215 St. James St. West, Montreal.....	Joannes, Dubuisson, etc.
Quebec Gold Research, Limited.....	Room 320, Castle Building, 1410 Stanley Street, Montreal.....	Desmeloizes
* Quebec Manitou Mines, Limited....	Room 27, 48 Sparks Street, Ottawa, Ont.....	Bourlamaque
Quebec Mining Properties Exchange, Inc.....	Amos.....	Varsan
Quebec United Mines, Limited.....	Room 25, 354 St. Catherine St. West, Montreal.....	Royal Roussillon
* Quebec Viking Gold Mines, Ltd....	Room 305, 330 Bay Street, Toronto, Ont.....	Beauchastel
Quemaque Gold Mines, Limited.....	Room 207, 71 St. Peter Street, Quebec	Bourlamaque
Quemartic Mines, Limited.....	330 Bay Street, Toronto, Ont.....	Fournière
Questor Gold Mines, Limited.....	310 Confederation Building, Montreal	Rouyn and Joannes
* Ramsey Gold Mines, Limited.....	27 St. John Street, Quebec.....	Clermont
* Randall Mines Corporation.....	189 St. John Street, Quebec.....	Landrienne
Rand Malartic Mines, Limited.....	Malartic.....	Fournière
* Ranic Gold Mines, Limited.....	Amos.....	Duverny
Raymond Tiblemont Syndicate.....	Room 207, 200 Bay Street, Toronto, Ont.....	Tiblemont
* Red Gold Mining Company, Ltd....	159 Craig Street West, Montreal.....	Rouyn
Renault, Auguste.....	Ville-Marie, Pontiac Co.....	Dasserat
Reynolds (G. H.) Quebec Gold Mines, Limited.....	c/o Weinfeld & Rudenko, 132 St. James Street West, Montreal.....	Duverny
Ricanaw Mines, Limited.....	Room 719, 159 Craig Street West, Montreal.....	Dubuisson
* Richard Mining & Development Co., Limited.....	132 St James Street West, Montreal...	Varsan, Louvicourt, etc.
Riverside Gold Mines, Inc.....	495 Gamble Street, Rouyn.....	Beauchastel
Rocdor Gold Mines, Limited.....	1306 Star Building, 80 King Street West, Toronto, Ont.....	Dubulsson
* Rochette Gold Mines Company, Ltd.	Taschereau.....	Launay
* Rosco Development Company, Ltd.	210 St. James Street West, Montreal...	Rouyn
Rouleau Mines, Limited.....	Room 505, 660 St. Catherine St. West, Montreal.....	Bailly and Barry
* Routhier Cadillac Gold Mines, Ltd..	266 St. James Street West, Montreal...	Rouyn and Cadillac
* Rouyn Reward Gold Mines, Limited.	330 Bay Street, Toronto, Ont.....	Rouyn
* Rubec Mines, Limited.....	402 Insurance Exchange Building, Montreal.....	Cadillac
St-James Gold Mines, Limited.....	132 St. James Street West, Montreal...	Barlow
Saint-Jude Gold Mines, Limited.....	4 Notre-Dame Street East, Montreal...	Duprat
* St-Pierre Cadillac Gold Mines, Ltd..	Room 2101, 507 Place d'Armes, Montreal.....	Cadillac
Sandlac Gold Mines, Limited.....	407 McGill Street, Montreal.....	Guillet
San Pedro Gold Mining and Prospecting Corporation.....	6720 Sherbrooke Street East, Montreal	Tiblemont
Scott Chibougamau Mines, Limited...	Room 401, 215 St. James Street West, Montreal.....	Bousquet and Scott

GOLD—Continued

NAME OF OPERATOR	ADDRESS	LOCATION OF MINE (Township)
Seguin Rouyn Gold Mines, Limited...	Room 310, 1253 McGill College Avenue Montreal...	Rouyn
* Senator Mines, Limited.....	187 Main Street, Hull.....	Rouyn
Senneterre Prospectors, Limited.....	Amos.....	Tavernier
* Senore Gold Mines, Limited.....	Perron.....	Senneville and Pascalis
Senvar Mines, Limited.....	Room 603, 2-8 King Street East, To- ronto, Ont.....	Varsan
* Shawkey Gold Mining Company, Limited.....	57 Yonge Street, Toronto, Ont.....	Dubuisson
Shawmaque Gold Mines, Limited.....	Suite 1520, 660 St. Catherine St. West, Montreal.....	Dubuisson
* Sigma Mines, Limited.....	Bourlamaque.....	Bourlamaque
* Sim-Clere Gold Mines, Limited.....	Room 25, 84 Notre-Dame St. West, Montreal.....	Louvicourt
* Simmons Mining Company, Limited.....	266 St. James Street West, Montreal..	Rouyn
* Siscoe Extension Gold, Limited.....	Suite 930, 25 King Street West, To- ronto, Ont.....	Varsan and Dubuisson
* Siscoe Gold Mines, Limited.....	Room 905, Dominion Square Building, St. Catherine Street, Montreal.....	Varsan and Dubuisson
* Sladen Malartic Mines, Limited.....	Trust Building, Ottawa, Ont.....	Cadillac and Fournière
* Smith-Tibemont, Limited.....	1300 Aldred Building, 507 Place d'Ar- mes, Montreal.....	Tibemont
Snowshoe Gold Mines, Limited.....	34 Adelaide Street West, Toronto, Ont.	Varsan and Dubuisson
* Snowshoe Mines, Limited.....	603-4 Royal Bank Building, 2-8 King St. East, Toronto, Ont.....	Varsan and Dubuisson
Soma-Duverny Gold Mines, Limited...	Transportation Building, Montreal...	Duverny
Soroda Gold Mines, Limited.....	c/o Gravel, Thompson & Hearn, 65 Ste Anne St., Quebec.....	Beauchastel
* South Lamaque Gold Mines, Ltd....	c/o Savard & Savard, 71 St. Peter Street, Quebec.....	Dubuisson
* South Malartic Gold Mines.....	231 St. James Street West, Montreal..	Fournière
South Tibemont Gold Mines, Ltd.....	Room 205, 200 Bay Street, Toronto, Ont.....	Tibemont
* Stadacona Rouyn Mines, Limited...	719 Tramways Building, 159 Craig Street West, Montreal.....	Rouyn
Stadore Gold Corporation.....	80 St. Peter Street, Quebec.....	Rouyn
* Standard Gold Mines, Limited.....	1604 Aldred Building, 507 Place d'Ar- mes, Montreal.....	Bourlamaque
* Sturgeon Goldfields, Limited.....	Suite 341, Dominion Square Bldg., Montreal.....	Bousquet and Rouyn
Sudbury Contact Mines (1937), Ltd....	25 King Street West, Toronto, Ont.....	Dubuisson
Sulcoe Gold Mines, Limited.....	c/o Millar & Hunter, 59 Yonge St., Toronto 2, Ont.....	Dubuisson
Sullivan Bourlamaque Gold Mines, Limited.....	610 St. James Street West, Montreal..	Bourlamaque
* Sullivan Consolidated Mines, Ltd....	1207 Aldred Building, Montreal.....	Dubuisson
Syndicat Launayor, Limitée.....	445 St. François-Xavier Street, Mont- real.....	Launay
* Syndicat Minier de Gaboury.....	Guigues.....	Gaboury
Taylor Cadillac Gold Mines, Limited...	c/o Dupré, de Billy, Prévost & Home, 80 St. Peter Street, Quebec.....	Cadillac
* Teck-Hughes Gold Mines, Limited...	25 King Street West, Toronto, Ont....	Dubuisson
* Tétreault, Succession Pierre.....	70 Holyrood Avenue, Montreal.....	Montauban
Thompson Bousquet Gold Mines, Ltd..	1835 Bell Telephone Building, Mont- real.....	Bousquet
* Thompson Cadillac Mining Corpora- tion.....	Room 1835, Bell Telephone Building, Montreal.....	Cadillac...
Thompson Joanne Gold, Limited.....	Rouyn, Témiscamingue Co.....	Joannes
Tibemont Central Gold Mines, Ltd....	c/o Snyders, Limited, Waterloo, Ont..	Tibemont
Tibemont Island Mining Company, Ltd.....	Senneterre.....	Tibemont
* Tonawanda Mines, Limited.....	67 Yonge Street, Toronto, Ont.....	Cadillac
* True Fissure Mines, Limited.....	Room 405, 477 St. François-Xavier Street, Montreal.....	Cadillac and Dubuisson
Turno Cadillac Gold Mines, Limited...	18 Toronto Street, Toronto, Ont.....	Bousquet
Twin Cities, Incorporated.....	341 Dominion Square Building, Mont- real.....	Destor
* Twinlake Cadillac Gold Mines, Ltd..	407 McGill Street, Montreal.....	Cadillac
Twin Mac Gold Syndicate, Limited...	59 St. James Street West, Montreal...	Dubuisson
Unit Company, Limited.....	52 St. Peter Street, Quebec.....	Seigniorie of Rigaud, Vaudreuil
* United Gold Exploration, Limited...	Room 605, 276 St. James Street West, Montreal.....	Laverlochère
* United Gold Mines, Limited.....	c/o J. S. Prigent, 4948 Iverville Ave- nue, Montreal.....	Rouyn
Valbec Exploration, Limited.....	Room 102, 60 St. James Street, Mont- real.....	Bourlamaque and Louvicourt
Valco Cadillac Mines, Limited.....	8 Sault-au-Marlot, Quebec.....	Cadillac

GOLD—Continued

NAME OF OPERATOR	ADDRESS	LOCATION OF MINE (Township)
Valco Mines Company	8 Sault-au-Matelot, Quebec	Cadillac and Malartic
Val d'Or Mineral Holdings, Limited	Canadian Bank of Commerce Building, 25 King Street West, Toronto, Ont.	Dubuisson
Valmac Gold Mines, Limited	c/o Lefeur, Porrier & Latulippe, 207 Place d'Armes, Montreal	Bourlamaque
Val-Malartic Gold Mines, Limited	330 Bay Street, Toronto, Ont.	Fournière
* Vantage Mines Limited	330 Bay Street, Toronto, Ont.	Gillet
Varsan Gold Mines, Limited	Room 1701, 372 Bay Street, Toronto, Ont.	Varsan
Vauquelin-Sifton Lake Mines, Ltd.	Room 903, 217 Bay Street, Toronto, Ont.	Vauquelin
Ventures Claims, Limited	Canadian Bank of Commerce Building, 25 King Street West, Toronto, Ont.	Rouyn, Dufresnoy, etc.
Vicour Gold Mines, Limited	Room 713, Canada Permanent Building, 320 Bay Street, Toronto, Ont.	Louvicourt
Vimy Gold & Metals, Limited	201 Notre-Dame Street West, Montreal	Montauban
* Vipond-Cameron Mines, Limited	276 St. James Street West, Montreal	Rouyn
* Wahu Mines, Limited	Senneterre	Tibremont
* Waite-Amulet Mines, Limited	804 Royal Bank Building, 2-8 King St. East, Toronto, Ont.	Dufresnoy and Duprat
Washington Gold Mines, Limited	c/o H. A. Newman, 36 Toronto Street, Toronto, Ont.	Joannes
* Wawhano Mines, Limited	824 Royal Bank Building, Montreal	Roy and McKenzie
* Wedding River Gold Mines, Ltd.	1005 Bank of Hamilton Building, Toronto, Ont.	Desjardins
West Duverny Gold Mines, Limited	738 Dominion Square Building, Montreal	Duverny
* West Flo Gold Mines, Limited	1005 Bank of Hamilton Building, Toronto, Ont.	Desjardins
* West McWatters Syndicate, Limited	11 King Street West, Toronto, Ont.	Rouyn
* West Shore Malartic Gold Mines, Limited	Room 816, 1440 St. Catherine St., Montreal	Dubuisson and Malartic
West-Side Long Lac Mines, Limited	372 Bay Street, Toronto, Ont.	Bousquet
* West Siscoe Gold Mines, Limited	Room 907, 1010 St. Catherine Street West, Montreal	Dubuisson
* Westwood Cadillac Mines, Limited	Room 802, 437 St. James Street West, Montreal	Bousquet
Wildor Gold Mines, Limited	Kirkland Lake, Ont.	Bourlamaque
Wiltsey-Coghlan Mines, Limited	25 King Street West, Toronto, Ont.	Rouyn
* Wisik Gold Mines, Limited	Room 1401, 320 Bay Street, Toronto, Ont.	Dubuisson
Wolverine Mines, Limited	320 Bay Street, Toronto, Ont.	Bourlamaque
* Wood Cadillac Mines, Limited	437 St. James Street West, Montreal	Cadillac
Yates United Mines, Limited	132 St. James Street West, Montreal	Rawdon and Kilkenny
York Bousquet Gold Mines, Limited	437 St. James Street West, Montreal	Bousquet
Young-Shannon Gold Mines, Limited	1 Toronto Street, Toronto, Ont.	Dufresnoy
* Yprès Cadillac Mines, Limited	Suite 45, 171 Yonge St., Toronto, Ont.	Cadillac

KAOLIN

NAME OF OPERATOR	ADDRESS	LOCATION OF MINE (Township)
* Canada China Clay, Limited	Lac Rémi	Amherst
* Canadian Kaolin Silica Products, Ltd.	1007 Canada Cement Bldg., Montreal	Amherst

MAGNESITIC DOLOMITE

NAME OF OPERATOR	ADDRESS	LOCATION OF MINE (Township)
* Canadian Refractories, Limited	Canada Cement Building, Montreal	Grenville
* International Magnesite Company	Calumet	Harrington

MICA

NAME OF OPERATOR	ADDRESS	LOCATION OF MINE (Township)
* Ahearn, Wm.	538 McLaren Street, Ottawa, Ont.	Hull
* Bazinet, François	5778 Cartier Street, Montreal	Joliette
* Blackburn Bros., Limited	Blackburn Building, Ottawa, Ont.	Templeton and Hull

MICA—Continued

NAME OF OPERATOR	ADDRESS	LOCATION OF MINE (Township)
Brown Bros.	Lucky Reserve, Cantley, Wright Co.	Hull
Canadian Amber Mica Company	c/o Mr. A. D. MacPherson, Manager, 3542 Vendome Avenue, Montreal	Portland West
Carman, Osborn	Farm Point	Hull
* Charlevoix Radium Exploration Syndicate, Limited	278 St. Paul Street, Quebec	Lacoste and De Sales
* Chenier, Z. E.	148 Laurier Street, Rockland, Ont.	Grenville
Cheslock, Isidore	Poltimore	Portland West
* Cleary (G), Morris (M), Poirier (A)	c/o Mr. George Cleary, Wilson's Corners	Wakefield
Cross, S. H.	Farm Point	Hull
Cross, W. C.	209 Bridge Street, Hull	Hull
de Rainville, David	R. R. No. 1, Wilson's Corners	Wakefield
Ellard, Estate J.	Wright	Alleyn
Gauthier, J. B.	P. O. Box 226, Buckingham	Buckingham
Gracefield Mica Mining Company (The)	c/o Dr J. Albert Rouleau, 1300 Sherbrooke Street East, Montreal	Northfield
Hamilton, Percy	Perkins Mill	Templeton
Kent Brothers	Kingston, Ont.	Hull
Lanciault & Chartier	c/o Mr. Albert Chartier, L'Ascension, Labelle Co.	Viel
L'Heureux, Georges	637 Notre-Dame Street, Cap de la Madeleine	Wentworth
* McGarry, Edward	Wakefield	Wakefield
McGlashan (R. J.) & Co.	190 Montcalm Street, Hull	Wakefield
* McGlashan, Wm.	R. R. No. 1, Wilson's Corners	Wakefield
McManiman, C.	Rawdon	Rawdon
* Martin, A. G.	236 Besserer Street, Ottawa, Ont.	Hull and Wakefield
* Morlot, Charles	Low, Gatineau Co.	Low
Morris, Jos.	Wilson's Corners	Wakefield
* O'Brien & Fowler, Limited	900 Victoria Building, Ottawa, Ont.	Ville-neuve
* Papineauville Lumber Co., Limited	Papineauville	Templeton
Poulin (Ernest) & Holmes (Thos.)	Cantley	Hull
St. Lawrence Mica Mines, Limited	105 Côte de la Montagne, Quebec	Cote de Beaupré Seigniory
Saguenay Mica Company, Limited	c/o Mr. Germain Beaulieu, P.O. Box 21, Quebec	
* Simard, Eugène	Bon Désir, Saguenay Co.	Bergeronnes
* Sparks, Wm. J.	343 Bell Street, Ottawa, Ont.	Hincks
* Trudeau, William	Old Chelsea	Hull
* Wallingford, Edward	Perkins	Templeton
Wallingford, Edward, Jr.	Perkins	Gore of Templeton
Wilson, Estate S.	Cascade	Thorne
Winning (Bush) & Cameron (Urbain)	c/o Mr. Bush Winning, Notre-Dame-de-la-Salette	Portland West

MINERAL WATER

NAME OF OPERATOR	ADDRESS	LOCATION OF SPRING
* Abenakis Springs Company	Blondin	Saint-François-du-Lac
* Cie d'Eau Minérale (La)	148 Concorde Street, St-Hyacinthe	St-Hyacinthe-le-Confesseur
* Cie d'Embouteillage Idéal (La)	3 St-Germain Street, St-Hyacinthe	Abenakis Springs
* Cie d'Embouteillage St-Laurent (La)	64 St. Peter Street, St-Hyacinthe	St-Hyacinthe
Coulombe, J.	L'Épiphanie, L'Assomption Co.	L'Épiphanie
* Eau Minérale Etoile	Ste-Geneviève-de-Batiscan	Batiscan
* Eau Naturelle Purgative de Chambord, Ltée (L.)	c/o Mr. David Doré, Desbiens	Métahetchouan township
* Gurd, Chas., & Co., Limited	1016 Bleury Street, Montreal	Varennes
* Lacerte, Mrs. Adélar	Saint-Sévère, St-Maurice Co.	Saint-Sévère
* Lamarre, Josaphat	Saint-Barnabé North, Saint-Maurice Co.	Saint-Barnabé
* Maski Bottling Works	Maskinongé	Maskinongé
* Pellerin, Albert	Saint-Barnabé North, Saint-Maurice Co.	Saint-Barnabé
* Radnor Mineral Water Springs	Saint-Maurice, Champlain Co.	Radnor Forges
* Richard, Gérard	Saint-Grégoire, Nicolet Co.	Saint-Grégoire
Thomson (R.G.O.) & Moore (W.H.)	Room 26, 88 King Street East, Toronto, 2, Ont.	Saint-Léon, Maskinongé Co.

MOLYBDENITE

NAME OF OPERATOR	ADDRESS	LOCATION OF MINE (Township)
* Bain (John) Estate.....	c/o Toronto General Trust Corporation Ottawa, Ont.....	Masham
Height of Land Company (The).....	4327 Old Orchard Avenue, Montreal..	Preissac
Lalonde, T. A., Ltée.....	Amos (Abitibi).....	Preissac
Lamotte Mines, Limited.....	445 St-François-Xavier Street, Mont- real.....	La Corne
Madore (W.W.) & Germain (Gabriel)	4321-A Brébeuf Street, Montreal.....	Seigniory of Deschambault
Riley, James.....	Hodgins, Pontiac Co.....	Thorne

OCHRE and IRON OXIDE

NAME OF OPERATOR	ADDRESS	LOCATION OF MINE
* Argall, Thos. H.....	Argall's Siding, Pointe-du-Lac.....	Pointe-du-Lac
* Girardin, Charles D.....	P.O. Box 104, Yamachiche.....	Almaville
* McNicoll, Eugene.....	354 St. Catherine Street East, Mont- real.....	Marchand township
Montmorency Paint Products Co., Ltd.	6684 St. Urbain Street, Montreal.....	Les Forges, Trois-Rivières
* Sherwin-Williams Co. of Canada, Ltd. (The).....	2875 Centre Street, Montreal.....	Red Mill, Champlain Co..

PEAT

NAME OF OPERATOR	ADDRESS	LOCATION OF BOG
Compagnie de Tourbe, Ltée (La).....	P.O. Box 2468, Montreal.....	
* Insulation, Limited.....	55 O'Brien Boulevard, St-Laurent, Montreal.....	Isle Verte
* Lambert, F. X.....	Sainte-Anne-de-la-Pocatière.....	Rivière Ouelle
* Thériault & Malenfant, Inc.....	Post Office, Saint-Arsène, Rivière-du- Loup.....	Rivière-du-Loup
* Waterville Moss & Peat Mines.....	Waterville, Compton Co.....	Compton township

PHOSPHATE

NAME OF OPERATOR	ADDRESS	LOCATION OF MINE (Township)
Blackburn Bros.....	711 Blackburn Building, Ottawa, Ont.	Templeton
* Cameron, Donald & W. A.....	Buckingham.....	Portland West
Cross, Walter C.....	209 Bridge Street, Hull.....	
Kent Bros.....	Mica Dealers, Kingston, Ont.....	Chelsea
Majeau, Donat.....	Notre-Dame-de-la-Salette.....	Portland East
St-Amour, A.....	Notre-Dame-de-la-Salette.....	Templeton
* Wallingford Bros.....	Perkins.....	Portland West
Winning (Bush) & Cameron (Urbain)	c/o Bush Winning, Notre-Dame-de-la- Salette.....	

PYRITE

NAME OF OPERATOR	ADDRESS	LOCATION OF MINE (Township)
* Consolidated Copper & Sulphur Co.	Eustis.....	Ascot

SILICA (Rock and Sand)

NAME OF OPERATOR	ADDRESS	LOCATION OF MINE (Township)
* Canadian Carborundum Company...	Shawinigan Falls.....	Saint-Canut parish
* Canadian Flint and Spar Co., Ltd..	900 Victoria Building, Ottawa, Ont..	Derry
* Canadian Kaolin Silica Products, Ltd	1007 Canada Cement Bldg., Montreal	Amherst
Donaldson, Robert J.....	Glen Almond.....	Buckingham
Flint Sands, Limited.....	24 King Street West, Toronto, Ont..	Guigues
Hill, Nelson.....	Glen Almond.....	Buckingham
McClements, Albert.....	Buckingham.....	
* Montpetit, Euclide.....	Melocheville.....	Beauharnois parish
O'Brien & Fowler, Limited.....	900 Victoria Building, 140 Wellington Street, Ottawa, Ont.....	Derry

SILICA (Rock and Sand)—Continued

NAME OF OPERATOR	ADDRESS	LOCATION OF MINE (Township)
* Ottawa Silica and Sandstone, Ltd.	Plaza Building, Ottawa, Ont.	Templeton
* Parcher, Alfred	Glen Almond	Derry
* Pedneaud, G.	Buckingham	Buckingham
* Silica Products of Canada, Ltd.	81 Taché Street, Chicoutimi	Dequen
Fellers (Walter) & Percher (Alton)	Glen Almond	Derry
* Stewart, Wm.	P.O. Box 19, Buckingham	Buckingham
Winning & Downing	Notre-Dame-de-la-Salette	Buckingham
Winning, Bush	Notre-Dame-de-la-Salette	Portland West and Wells

SILVER

NAME OF OPERATOR	ADDRESS	LOCATION OF MINE (Township)
* Arntfield Gold Mines, Limited	159 Bay Street, Toronto, Ont.	Beauchastel
* Beattie Gold Mines, Limited	Canadian Bank of Commerce Building, 25 King Street West, Toronto, Ont.	Duparquet
* Belleterre Mines, Limited	15 King Street West, Toronto 2, Ont.	Guillet
Bussières Mining Company, Limited	221 Notre-Dame Street West, Mont- real	Louvicourt
* Canadian Malartic Gold Mines, Ltd	25 King Street West, Toronto, Ont.	Malartic
* Consolidated Copper & Sulphur Co.	Eustis	Ascot
* Granada Gold Mines, Limited	244 Bay Street, Toronto, Ont.	Rouyn
* Greene Stabell Mines, Limited	Canadian Bank of Commerce Building, 25 King Street West, Toronto, Ont.	Dubuisson
* Gulf Development Company, Ltd.	486 St. John Street, Montreal	Munn
* Lamaque Gold Mines, Limited	Bourlamaque	Bourlamaque
McWatters Gold Mines, Limited	P.O. Box 689, Rouyn	Rouyn
* Mines Development Corporation	189 St. John Street, Quebec	Landrienne
Newbec Mines, Limited	603 Royal Bank Building, Toronto 2, Ont.	Dufresnoy
* Noranda Mines, Limited	804 Royal Bank Building, 2-8 King St. East, Toronto 2, Ont.	Rouyn
* O'Brien Gold Mines, Limited	Kewagama	Kewagama
* O'Neill Thompson Gold Mines, Ltd.	Roxborough Apartments, Ottawa, Ont.	Joannes
* Perron Gold Mines, Limited	Pascalis (Abitibi)	Pascalis
Robb-Monthray Mines, Limited	Room 1001, 85 Richmond Street West, Toronto, Ont.	Montbray
* Shawkey Gold Mines Company, Ltd	67 Yonge Street, Toronto, Ont.	Dubuisson
* Siscoe Gold Mines, Limited	Room 905, Dominion Square Bld'g, St. Catherine Street, Montreal	Dubuisson and Varsan
* Stadacona Rouyn Mines, Limited	719 Tramways Building, 159 Craig Street West, Montreal	Rouyn
* Sullivan Consolidated Mines, Ltd.	1207 Aldred Building, Montreal	Dubuisson
* Tétreault (Pierre) Estate	70 Holyrood Avenue, Montreal	Montauban
* Thompson Cadillac Mining Corpora- tion	Room 1835, Bell Telephone Bld'g, Montreal	Cadillac
Waite Amulet Mines, Limited	804 Royal Bank Building, 2-8 King Street East, Toronto, Ont.	Duprat and Dufresnoy

SOAPSTONE and TALC

NAME OF OPERATOR	ADDRESS	LOCATION OF MINE (Township)
* Broughton Soapstone & Quarry Co., Limited	Broughton Station, Beauce Co.	Broughton
* Fortin, Charles	Robertsonville	Thetford
Megantic Mining Company (The)	175 Spadina Road, Toronto, Ont.	Ireland
Parker, N. S.	Eastman	Bolton
* Pharo, L. C.	Thetford Mines	Broughton
Pibus, Mrs George R.	Knowlton	Bolton West
Reed Realities, Limited	c/o H. A. Peverley, 1536 St. Mark St., Montreal	Thetford

TITANIC IRON

NAME OF OPERATOR	ADDRESS	LOCATION OF MINE
American Titanic Iron Co., Limited	c/o J. H. Boisvert, Parliament Build- ings, Quebec	Saint-Urbain parish
* Baie St-Paul Titanic Iron Ore	c/o Mr. J. O. Paré, N.P., Baie St-Paul	Saint-Urbain parish

TITANIC IRON—Continued

NAME OF OPERATOR	ADDRESS	LOCATION OF MINE
Canadian Pyrites Company.....	c/o Dupont de Nemours, Wilmington, Delaware, U.S.A.....	Saint-Urbain Parish.
Loughborough Mining Company, Ltd.	Sydenham, Ont.....	Saint-Urbain parish.
Titanium (Canada), Limited.....	11 Bates Road, Outremont, Montreal.	Beresford township
Titanium Products Corporation.....	c/o Mr. G. C. Piché, 874 Sherbrooke St. East, Montreal.....	Bourget township

ZINC and LEAD

NAME OF OPERATOR	ADDRESS	LOCATION OF MINE (Township)
Alpha Mining Company.....	c/o Hollinger Consolidated Gold Mines Limited, Timmins, Ont.....	Duhamel
* Federal Zinc & Lead Co., Limited..	Room 608, 1117 St. Catherine St. West, Montreal.....	Lemieux
Gaspé Mines.....	c/o Hon. John Hall Kelly, New Carlisle.....	Lemieux
* Gulf Development Company, Ltd.	486 St. John Street, Montreal.....	Mann
Lyall & Beidelman.....	Room 608, Drummond Building, 1117 St. Catherine Street West, Montreal	Lemieux
North American Mining Company....	New Carlisle.....	Lemieux
* Shawinigan Mining & Smelting Co., Limited.....	c/o Hon. W. T. Henderson, Sec'y, 116 Dalhousie Street, Brantford, Ont....	Montauban and Chavigny
* Tétréault (Pierre) Estate.....	70 Holyrood Avenue, Outremont, Montreal.....	Montauban
Waite Amulet Mines, Limited.....	Room 804, Royal Bank Building, 2-8 King Street East, Toronto, Ont....	Duprat and Dufresney

II.—STONE QUARRIES, CLAY AND SAND PITS

BRICK

NAME OF OPERATOR	ADDRESS	LOCATION OF PLANT
Ascot Tile & Brick Company, Ltd....	Ascot Corner.....	Ascot Corner
Bourbeau, Georges.....	R.R. No. 1, Danville, Richmond Co....	Kingsey Falls
Brique Champlain, Limitée (La).....	56 Laliberté Street, Quebec.....	Beaufort
Brique Citadelle, Limitée (La).....	14 St. Joseph Street, Quebec.....	Boischatel
Brique de Scott, Enrg. (La).....	Scott, Dorchester Co.....	Scott Junction
Cie de Brique Panet, Limitée (La)....	L'Islet.....	L'Islet
Coté, Albert.....	Victoriaville.....	Victoriaville
Desmarais, Stanislas.....	Richmond.....	Richmond
Duquette, Isidore.....	East Angus.....	Westbury township
Gaulin, Évangéliste.....	Princeville.....	Stanford township
Hodgins, David T.....	Shawville.....	Clarendon township
Industrielle de St. Tite, Ltée (L')....	St-Tite, Champlain Co.....	Saint-Tite
Laprairie Company, Inc. (The).....	University Tower Building, 660 St. Catherine Street West, Montreal.....	Laprairie and Delson
Longpré, Emile.....	St-Félix-de-Valois.....	St-Félix-de-Valois
Parrot, Michel H.....	Deschaillons, Lotbinière Co.....	Deschaillons
Potvin, Alphonse.....	Deschaillons.....	Deschaillons
St. Lawrence Brick Co., Limited.....	935 Dominion Square Building, 1010 St. Catherine Street West, Montreal.....	Laprairie
Stone Bros.....	Brôme, Brôme Co.....	Brôme
Suddard (E. F.) Brick Works.....	Gaspé.....	Douglas township
Tremblay, Jules.....	Chicoutimi.....	Chicoutimi

CEMENT

NAME OF OPERATOR	ADDRESS	LOCATION OF PLANT
Canada Cement Company.....	P. O. Box 290, Station B, Montreal....	Montreal East and Hull

GRANITE

NAME OF OPERATOR	ADDRESS	LOCATION OF QUARRY
Alcoa Power Company, Limited.....	P. O. Box 620, Kénogami.....	
Bernier, Auguste.....	Roberval.....	Roberval township
Berry and Redicker Granite Quarry..	Beebe.....	Stanstead township
Bérubé, Lucien & Fils.....	Brownsburg.....	Chatham township
Brodie's, Limited.....	1070 Bleury Street, Montreal.....	Graniteville, Guenette and Mount Johnson
Brunet, Joseph.....	1411 Côte des Neiges Road, Montreal.	Chatham township
Bullock, Wright.....	Graniteville, Stanstead Co.....	Stanstead township
Bussière, Amedée.....	Ste-Cécile, Compton Co.....	Barnston and Whitton tps.
Chicoutimi, City of.....	Chicoutimi.....	Chicoutimi
Cloutier (Ernest) & Lavers (Clifford)	Beebe.....	Stanstead township
Cloutier, R. L.....	Beebe.....	Stanstead township
Delwaide & Goffin.....	12-16 du Havre Street, Chicoutimi...	Chicoutimi and Simard twps.
Deschambault Quarry Corporation....	52 St. Paul Street, Quebec.....	Stratford township
Diamond Granite Company.....	Beebe.....	Stanstead township
Dontigny, Alphonse.....	112 de la Station Street, Shawinigan Falls.	Glenada
Drummond Quarry, Limited.....	Drummondville.....	Wendover township
Dubois, Honoré.....	Rivière-à-Pierre, Portneuf Co.....	Colbert township
Dumas (Arthur) Cie, Enrg.....	Rivière-à-Pierre, Portneuf Co.....	Bois township
Dumas, Auguste.....	Rivière-à-Pierre, Portneuf Co.....	Bois township
Foundation Co. of Canada, Ltd.....	485 McGill Street, Montreal.....	Laféche township
Gagnon, Arthur.....	Grand'Mère.....	Grand'Mère
Gingras & Frères, Ltée.....	St-Marc-des-Carières, Portneuf Co..	Barnston township
Gosselin, Oscar.....	Mégantic.....	St-Sébastien
Granit Rouge de St-Canut, Enrg.....	757 Mont-Royal Avenue East, Montreal.	St-Colomban
Granit National, Limitée (Le).....	St-Joseph-d'Alma, Lac St-Jean.....	Signay township
Grenier, Elie.....	Glenada.....	Ste-Flore parish
Guenette Granite Company, Ltd.....	Guénette, Labelle Co.....	Campbell township
Hartley, A. C.....	Beebe.....	Stanstead township
Haselton, Wm.....	Beebe.....	Stanstead township
Hébert, O.....	Ville-Marie, Témiscamingue Co.....	Ville-Marie and Laverlochère
Henrikson, Anton.....	Graniteville, Stanstead Co.....	Stanstead township
Inter-Provincial Construction Ltd. (The).....	c/o Mr. J. A. Bourbonnais, Vaudreuil Station, Vaudreuil Co.....	Rigaud
Jonquière, City of.....	Jonquière.....	Jonquière township
Lacasse & Boulais.....	P.O. Box 23, Beebe.....	Stanstead township
McIntosh, Robert.....	R.R. No. 1, Beebe.....	Stanstead township
Montreal Construction Supply & Equipment, Limited.....	1460 Sherbrooke Street West, Montreal.	Montreal
Nett, Olson, Hokanson & Hennkson..	R.R. No. 1, Beebe.....	Graniteville
Perron, Arthur.....	Rivière-à-Pierre.....	Bois township
Perron, Stanislas.....	Rivière-à-Pierre.....	Bois township
Port Alfred, City of.....	Port Alfred, Chicoutimi Co.....	Port Alfred
Reynolds, M. C.....	Cedarville.....	Stanstead township
Saint-Bruno Quarry & Paving Co., Ltd	636 Querbes Avenue, Outremont, Montreal.	Saint-Bruno
St-Joseph-d'Alma, City of.....	St-Joseph-d'Alma, Lac St-Jean.....	Saint-Joseph-d'Alma
Scotstown Granite Company, Limited.	Scotstown.....	Scotstown
Shawinigan Falls, City of.....	Shawinigan Falls.....	Almaville
Silver Granite Company.....	180 Côte d'Abraham, Quebec.....	Gayhurst and Bois townships
Stanstead Granite Quarries Co., Ltd..	Beebe.....	Stanstead township
Thibaudeau & St-Pierre.....	Rivière-à-Pierre.....	Bois township
Tremblay, Joseph.....	Baie St-Paul, Charlevoix Co.....	Baie St-Paul
Voyer (Fortunat) & Frère.....	Rivière-à-Pierre, Portneuf Co.....	Bois township
Wilkinson, Frank.....	Beebe.....	Stanstead township

LIME

NAME OF OPERATOR	ADDRESS	LOCATION OF KILN
Arnaud & Beaudry.....	16 Ste-Angelique Street, Joliette.....	Joliette
Boivin, Arthur.....	Pont Rouge, Portneuf Co.....	Pont Rouge
Bouchard, Fabien.....	Ste-Anne-de-Chicoutimi, Chicoutimi, Co.	Tremblay township
Canadian Lime Products Co.....	c/o Mr. Jos. Camarda, Cap St-Martin, Laval Co.	Cap St-Martin
Canada Lime & Stone, Limited.....	St-Marc-des-Carières, Portneuf Co..	St-Marc-des-Carières
Carswell, R. W.....	Bryson, Pontiac Co.....	Bryson
Côté, Xavier.....	St-Jérôme, Lac Saint-Jean Co.....	Métabetchouan township
Desfonds, Gaspard.....	St-Cuthbert, Berthier Co.....	St-Cuthbert
Dominion Lime Company (The).....	East Angus.....	Dudswell township
Dontigny, Yvon.....	Ste-Thécle, Champlain Co.....	Sainte-Thécle

LIME—Continued

NAME OF OPERATOR	ADDRESS	LOCATION OF KILN
Drouin, Eva Cimon.....	Ste-Justine (Post Office Langevin), Dorchester Co.....	Sainte-Justine
Filion, Narcisse.....	St-Joachim, Montmorency Co.....	Saint-Joachim
Gagné, Octave.....	St-Ulric, Matane Co.....	St-Ulric
Giroux, Pierre Gédéon.....	Beauport Est.....	Beauport Est
Héon & Héon.....	St-Louis-de-Champlain.....	St-Louis-de-France
Ialumière, Joseph.....	St-Dominique-de-Bagot.....	St-Dominique-de-Bagot
Limoges, Henri.....	552 Poupard Street, Montreal.....	Montreal
Mercure, Camille.....	9 St-Denis Street, St-Hyacinthe.....	St-Dominique-de-Bagot
National Stone & Lime Co., Reg'd. (The)	c/o Mr. H. E. Roy, Joliette.....	St-Marc-des-Carrières
Pères Trappistes de Mistassini (Les Ré- vérends)	Mistassini, Lac St-Jean Co.....	Mistassini
Shawinigan Chemicals, Limited.....	Room 611, 107 Craig Street West, Montreal.....	Shawinigan Falls
Standard Lime Co., Limited.....	Joliette.....	St-Paul-de-Joliette and St- Marc-des-Carrières
Stinson Reeb Builders Supply Co.....	5585 Delorimier Avenue, Montreal...	Montreal
Trottier, David.....	St-Marc-des-Carrières.....	St-Marc-des-Carrières
Villeneuve, Raoul.....	c/o Eagle Lumber Company, 169 St. Georges St., Saint-Jérôme, Terre- bonne Co.....	St-Jérôme

LIMESTONE

NAME OF OPERATOR	ADDRESS	LOCATION OF QUARRY
Alban Construction, Limited.....	1460 Sherbrooke Street West, Mont- real.....	St-Alban Parish
Andorno, Emmanuel.....	Cap St-Martin.....	Cap Saint-Martin
Baillargeon & Faubert.....	62 Boulevard Union, St-Lambert, Chambly Co.....	Caughnawaga
Beaudry, Jos. Pitre.....	P. O. Box 209, Taché Street, Joliette.....	Joliette
Bégin, Joseph.....	176 de la Ronde Street, Quebec.....	Beauport
Bélisle, Jos.....	Ste-Anne-des-Plaines, Terrebonne Co.....	Baie-Saint-Paul
Boily, Albert.....	Baie Saint-Paul, Charlevoix Co.....	Baie Saint-Paul
Boivin, Ladislav.....	Baie Saint-Paul, Charlevoix Co.....	Maria township
Bujold, Clement.....	St-Jules-de-Maria, Bonaventure Co.....	Hull
Canada Cement Company, Limited	P. O. Box 290, Station B, Montreal.....	Montreal
Canadian Quarries, Limited.....	4740 Iberville Street, Montreal.....	Cap Saint-Martin
Carrière Cap Saint-Martin, Enrg.....	636 Querbes Avenue, Montreal.....	Château-Richer
Carrière Gravel, Ltée (La).....	Château-Richer.....	Ste-Clothilde
Carrière Marcell, Ltée (La).....	St-Michel Station, Napierville Co.....	Montreal-Est
Carrière Montréal-Est.....	c/o Mr. Cyrille Durocher, 11021 No- tre-Dame Street East, Montreal.....	Saint-Barthélemi
Carrière St-Barthélemi, Ltée.....	St-Barthélemi, Berthier Co.....	Saint-Marc-des-Carrières
Carrières Saint-Marc, Limitée.....	Saint-Marc-des-Carrières.....	St-Louis-de-France
Carrière Saint-Maurice, Ltée.....	307 Alexandre Street, Trois-Rivières.....	Saint-Godefroi
Cercle Agricole de St-Godefroi (Le).....	c/o Mr. Edgar Nadeau, St-Godefroi, Bonaventure Co.....	Saint-François-de-Sales
Charbonneau & Frère.....	St-François-de-Sales.....	Cap St-Martin
Charbonneau, Gonzague.....	8013 St-Denis Street, Montreal.....	Port-Daniel
Charron, Arthur.....	Village Bélanger, Laval Co.....	Pont Rouge
Chenel, Rev. J. E.....	Port Daniel Centre, Bonaventure Co.....	Saint-Marc-des-Carrières
Delisle, Emilien.....	Pont-Rouge, Portneuf Co.....	Lime Ridge
Deschambault Quarry Corporation.....	52 St-Paul Street, Quebec.....	Ste-Justine
Dominion Lime Company.....	East Angus.....	Denonville township
Drouin, Eva Cimon.....	Ste-Justine, Dorchester Co.....	Rivière-des-Prairies
Dubé, Philippe.....	St-Clement, Rivière-du-Loup Co.....	Ville de Léry
Dufresne Construction Co., Ltd.....	1832 Boulevard Pie IX, Montreal.....	Ville de Léry
Faubert, Alphonse.....	Ville de Léry, Chateauguay Co.....	Lachûte
Faubert, Donat.....	Ville de Léry, Chateauguay Co.....	Hull
Filion, Adélar.....	Lachûte.....	Hope township
Filion, Donat.....	123 Papineau Street, Hull.....	Pointe Claire
Francoeur, J. B.....	Kelly, Bonaventure Co.....	St-Ulric
Fuger & Smith, Limited.....	Pointe Claire.....	Port Daniel
Gagné, Octave.....	St-Ulric, Matane Co.....	St-Marc-des-Carrières
Gaspesian Fertilizer Co., Reg'd.....	Port Daniel East.....	Village Bélanger
Gauthier, J. Olivier.....	Saint-Marc-des-Carrières.....	Saint-Marc-des-Carrières
Gauthier, René.....	Village Bélanger, Laval Co.....	Saint-Louis-de-Courville
Gingras & Frère, Ltée.....	Saint-Marc-des-Carrières.....	Ste-Elizabeth
Giroux, F. X. R.....	Saint-Louis-de-Courville.....	
Guilbault & Frère.....	Ste-Elizabeth, Joliette Co.....	
Guillemette, André.....	Saint-Marc-des-Carrières.....	

LIMESTONE—Continued

NAME OF OPERATOR	ADDRESS	LOCATION OF QUARRY
Harrison, Georges.....	Poncheville, Matane Co.....	Seigniory of Matane
Kennedy Construction Co., Ltd.....	310 Shaughnessy Building, 407 McGill St., Montreal.....	Acton Vale
Laberge & Marchand.....	Chateauguay.....	Chateauguay
Lacouline, Théodore.....	Château-Richer.....	Château-Richer
Lagacé Quarry, Limited.....	Saint-Martin, Laval Co.....	Saint-Martin
Lapointe, A. & E.....	12034 Lachapelle Street, Montreal.....	Cartierville, Montreal
Lapointe, Emile.....	Saint-Dominique-de-Bagot.....	Saint-Dominique-de-Bagot
La Salle Products, Limited.....	199 Jean Talon Street West, Montreal.....	Côte Saint-Michel
Laurendeau (A.) & Cie, Ltée.....	Room 310, Thémis Building, 10 St. James Street West, Montreal.....	Lachûte
Laurentian Stone Co., Ltd.....	82 Crémazie Street, Hull.....	Hull
Iauzon, Emery.....	7977 Shelly, Saint Michel, Laval Co.....	St-Michel
Laviolette, D. O.....	166 Montcalm Street, Hull.....	Hull
Leclerc, Edouard.....	Saint-Joachim, Montmorency Co.....	Saint-Joachim
Leclerc, J. J.....	Drapeau, Bonaventure Co.....	Nouvelle township
Leclerc & Robitaille, Enrg.....	Roberval.....	Roberval township
Leclercier, Victor.....	8465 Berri Street, Montreal.....	Cap Saint-Martin
Léger & Charlton.....	400 Notre-Dame Street, Lachine.....	Lachine
Levesque, Armand.....	Roberval.....	Roberval
Martineau & Fils, Ltée.....	517 Marie Anne Street East, Montreal.....	Montreal
Matthew Devito Construction, Ltd.....	6138 Hamilton, Street, Montreal.....	Pointe Claire
Mercure, Camille.....	9 St. Denis Street, St-Hyacinthe.....	St-Dominique-de-Bagot
Miner (R. H.) Co., Ltd.....	7411 de Lanaudière Street, Montreal.....	Montreal
Montreal Construction Supply & Equipment, Limited.....	1460 Sherbrooke Street West, Montreal.....	Montreal
Montreal Quarry, Limited.....	1340 Bellechasse Street, Montreal.....	Montreal
National Quarries, Limited.....	Park Avenue & Beaubien Street, Montreal.....	Côte St-Michel
Noel, Oscar & Cie.....	44 Wright Street, Hull.....	Wrightville
Paquette (Lévis) & Cie.....	Cap Saint-Martin, Laval Co.....	Cap Saint-Martin
Parent, Chas.....	Cap St-Martin, Laval Co.....	Cap Saint-Martin
Pearson, Honoré.....	Port Daniel, Bonaventure Co.....	Port-Daniel
Pénitencier de St-Vincent-de-Paul.....	Saint-Vincent-de-Paul.....	St-Vincent-de-Paul
Pères Trappistes de Mistassini (Les).....	Mistassini.....	Pelletier township
Petitjean, V. F.....	4525 Chabot Street, Montreal.....	Cap St-Martin
Quinlan Cut Stone, Limited.....	1165 Greene Avenue, Westmount, Montreal.....	St-François-de-Sales
Rousseau, T. E.....	48 Second Avenue, Quebec.....	Val Brillant
St. Francis Rock Products & Equipment, Limited.....	8050 Bloomfield Avenue, Montreal.....	Ville Saint-Laurent
St-Onge, O. F.....	St-Dominique-de-Bagot.....	St-Dominique-de-Bagot
Saint-Laurent Quarry, Ltd.....	Village Bélanger, Laval Co.....	Village Bélanger
City of Salaberry de Valleyfield.....	Valleyfield.....	Valleyfield
Schetagne, W.....	Pointe Claire, Jacques-Cartier Co.....	Pointe Claire
Shawinigan Chemicals, Limited.....	Room 611, Power Building, 107 Craig Street West, Montreal.....	St-Damien-de-Stanbridge
Standard Clay Products, Limited.....	P. O. Box 819, St. Johns.....	St. Johns
Standard Lime Company, Limited.....	Joliette.....	St-Paul-de-Joliette & St-Marc-des-Carrières
Stone & Quarry, Limited.....	1340 Bellechasse Street, Montreal.....	St-François-de-Sales
Théorêt, Magloire.....	Bellerive, Valleyfield.....	Nouveau Salaberry
Tremblay, Nap.....	Joffre Avenue, Hull.....	Hull
Trudel, Napoléon.....	St-Irénée, Charlevoix Co.....	Charlesbourg
Union Quarries and Paving, Limited.....	Room 113, 3 Boulevard Charest, Quebec.....	St-Michel-de-Laval
Union Quarry, Limited.....	1340 Bellechasse Street, Montreal.....	Giffard
Verreault (Elzéar), Limitée.....	194 Du Pont Street, Quebec.....	Pointe-au-Pic
Villeneuve, François.....	Pointe-au-Pic, Charlevoix Co.....	Pointe-au-Pic
Vinclette, Paul.....	St-Honoré, Chicoutimi Co.....	Saint-Honoré
Voirie, Département de la.....	Parliament Buildings, Quebec.....	Bordeaux and St-Timothée
Warren, Robert.....	Pointe-au-Pic, Charlevoix Co.....	Pointe-au-Pic

MARBLE

NAME OF OPERATOR	ADDRESS	LOCATION OF QUARRY
Canada Marble and Lime Company.....	1502 St. Catherine St. West, Montreal.....	L'Annonciation
Wallace Sandstone Quarries, Limited.....	Architects Building, 1135 Beaver Hall Hill, Montreal.....	Philipsburg
White Grit Company.....	Hurdman Road, Ottawa, Ont.....	Portage-du-Fort

POTTERY

NAME OF OPERATOR	ADDRESS	LOCATION OF PLANT
Bégin (Olivier), Enrg.	R.R. No. 1, St-Sauveur, Quebec Co.	Petite Rivière
Brique Champlain, Ltée (La)	56 Laliberté Street, Quebec	Beauport
Citadel Brick, Limited	14 St. Joseph Street, Quebec	Boischatel and L'Islet
Cie de Brique Panet, Ltée (La)	L'Islet	L'Islet
Canada Fire Brick Co., Ltd.	4741 St. Ambroise Street, Montreal	Saint-Johns
Canadian Potteries, Limited	140 Longueuil Street, St-Johns	Saint-Johns
Dominion Sanitary Pottery Co., Ltd.	189 St. James Street, St-Johns	Saint-Johns
Duquette, Isidore	East Angus	Westbury township
Hodgins, David T.	P.O. Box 148, Shawville	Clarendon township
Laprairie Company, Inc. (The)	University Tower Building, 680 St. Catherine Street West, Montreal	Laprairie and Delson
Montreal Terra-Cotta, Limited	Room 911, 1010 St. Catherine Street West, Montreal	Lakeside
Parrot, Michel	Deschailions, Lotbinière Co.	Deschailions
Standard Clay Products, Limited	P. O. Box 819, St-Johns	Saint-Johns
Tremblay, Jules	Chicoutimi	Chicoutimi

SAND and GRAVEL

NAME OF OPERATOR	ADDRESS	LOCATION OF PIT
Alcoa Power Company, Limited	P. O. Box 620, Kénogami	
Anctil, Léo	St-Philippe-de-Néri, Kamouraska Co.	
Asselin, Wilfrid	St-Eugène-de-Grantham, Drummond Co.	
Audet, Laurent	Ste-Marguerite, Dorchester Co.	
Auger, Edmond	St-Bruno, Chambly Co.	
Auger, Willie	St-Elie-de-Caxton, St-Maurice Co.	Caxton township
Bachand, Wilfrid	Roxton Falls	
Baillargeon, Nap.	Martinville, Compton Co.	Clifton township
Baker, H. S.	Rivière Beaudette, Soulanges Co.	
Ball, Clayton	Abbotsford	
Barbe, Alfred	Ste-Rose West, Laval Co.	
Beaudoin, T.	Broughton Station	
Bédard, Mrs. H.	Calumet Island, Pontiac Co.	
Begnoche, Adélar.	Saint-Blaise, Saint-Jean Co.	
Bélanger, Emile	Rang St-Michel, Beauport	
Bélanger, Joseph	Ascot Corner	Stoke township
Bélanger, Omer	Mout-Laurier, Labelle Co.	Campbell township
Bélisle, Euclide	145 St. Paul Street, Coaticook	
Belley, Jos. (Didier)	Jonquière	
Bennett, Gertrude M.	P. O. Box 403, Lennoxville	
Benoit, A. J.	Iberville	Mount St-Grégoire
Benoit, Josphat	St-Pie, Bagot Co.	
Bergeron, Ursin	Jonquière	Jonquière
Bernier, Nap.	St. Dominique, Bagot Co.	
Berthiaume, Charles Ed.	Contrecoeur, Verchères Co.	
Bertrand, Léo	Fort Coulonge, Pontiac Co.	Mansfield tp.
Bigras, Honoré	St-Vincent-de-Paul	
Bigras, Omer	Ste-Dorothée, Laval Co.	Ste-Rose West
Binette, Patrice	Garthby Station, Wolfe Co.	
Bisaillon, Gérard	L'Avenir, Drummond Co.	
Bitumen Products Corporation	3590 St. Patrick Street, Montreal	
Bonner Sand and Ballast, Ltd (The)	Room 201, St. Catherine St. West, Montreal	South Durham
Bordeleau, Henri	St-Stanislas, Champlain Co.	
Bouchard, Emile	La Décharge, Chicoutimi Co.	Bourget township
Boucher, Treffé	St-Stanislas, Champlain Co.	
Boucher, Wilfrid	Fugèreville, Témiscamingue Co.	Laverlochère township
Bou langer, Ernest	St-Fabien, Rimouski Co.	
Bourgeois, Edmond	St-Albert, Arthabaska Co.	St-Albert
Bourret, Arthur	La Patrie, Compton Co.	Ditton township
Boutin, Léo	Armagh Station, Bellechasse Co.	
Boutin, Nérée	St-Anselme, Dorchester Co.	
Bradley (J. P.) & Sons	St-Andrews, Argenteuil Co.	
Brassard, Jos. L.	Plessisville	Somerset South
Brault, F. Xavier	St-Dominique-de-Bagot	
Brault, Blaise	Sainte-Blaise, Saint-Jean Co.	
Brisebois, Edmond	Ste-Adèle, Terrebonne Co.	Morin township
Brouillette, Nelson	St-Narcisse, Champlain Co.	
Brouillette Sand & Gravel Co., Limited	Rawdon	Ste-Julienne
Canadian Johns-Manville Company, Limited	Asbestos	
Canadian National Railways	c/o E. G. Newson, Engineer Maintenance of Way, Union Station, Toronto 2, Ont.	

SAND and GRAVEL—Continued

NAME OF OPERATOR	ADDRESS	LOCATION OF PIT
Canadian Pacific Railway.....	Chief Engineer's Office, Windsor Station, Montreal.....	
Chabot, Abel.....	St-Jean-Baptiste, Rouville Co.....	
Chabot, Fortunat.....	Ste-Chaire, Dorchester Co.....	
Champagne, Jos.....	St-Norbert, Berthier Co.....	
Champoux, Mrs. J. C.....	Bécancourt, Nicolet Co.....	
Chaput, Uric.....	Mascouche, L'Assomption Co.....	
Chartier, Daniel.....	Wotton, Wolfe Co.....	
Coaticook, City of.....	P. O. Box 150, Coaticook.....	
ComEAU, Léopold.....	Richmond.....	Cleveland township
Compagnie de Sable, Ltée (La).....	10 Third Avenue, Quebec.....	Saint-Charles River
Consolidated Oka Sand & Gravel Co., Limited.....	248 McCord Street, Montreal.....	Lake of Two Mountains
Cossette, Jeffrey H.....	St-Narcisse, Champlain Co.....	
Coté, Idola.....	St-Urbain, Charlevoix Co.....	St-Urbain
Coté, Joseph.....	St-Fabien, Rimouski Co.....	
Coté, Wilfrid.....	Bulwer, Compton Co.....	Clifton township
Coulombe, Fabien.....	St-Fabien, Rimouski Co.....	
Couture, Emile.....	Lambton, Frontenac Co.....	Courecelles township
Damboise, Louis.....	Squatteck, Témiscouata Co.....	Robitaille township
D'Amours, Cyrice.....	Trois-Pistoles.....	
Denning, George.....	Maple Grove, Mégantic Co.....	
Deslandes, Léonard.....	St-Dominique, Bagot Co.....	
Deslandes, Mastai.....	St-Dominique, Bagot Co.....	St-Dominique
Desroches, Hermas.....	St-Paul-d'Abbotsford.....	
Dodds, John.....	Maryland, Pontiac Co.....	Bristol township
Dubé, Pantaléon.....	St-Denis, Kamouraska Co.....	
Dubé, Pierre.....	Rimouski.....	
Dubreuil, Albert.....	St-Dominique, Bagot Co.....	
Ducharme, J. E. Nap.....	St-Gabriel-de-Brandon, Berthier Co.....	
Dufour, Henry.....	Grande-Baie, Chicoutimi Co.....	
Dufour, Joseph.....	St-Hilarion, Charlevoix Co.....	
Dumas, Philias.....	14 St. Henri Street, Sherbrooke.....	
Dutrizac, Noel.....	Plage Laval, Laval Co.....	Sainte-Dorothée
Eastern Townships Paving and Contracting Co., Limited.....	P.O. Box 234, Sherbrooke.....	Ascot township
Emond, Art.....	Richmond.....	
Ferland, Z.....	Dosquet, Lotbinière Co.....	
Fontaine, Romulus.....	Weedon, Wolfe Co.....	Weedon township
Fortier, Pierre.....	Martinville, Compton Co.....	
Fortin, Elphège.....	Mont-St-Grégoire, Iberville Co.....	
Fournier, Achille.....	La Patrie, Pontiac Co.....	Ditton township
Fournier, J. B.....	Stanbridge, Missisquoi Co.....	Stanbridge township
Gagnon, Arthur.....	St-François-Xavier-de-la-Petite-Rivière, Charlevoix Co.....	
Gagnon & Frères, Enrg.....	St-David, Lévis Co.....	St-David
Garon, Isidore & Emmanuel.....	St-Denis, Kamouraska Co.....	
Gaudette, Joseph C.....	Béarn, Témiscamingue Co.....	Duhamel township
Gaudreau, Alfred.....	R.R. No. 3, Ayer's Cliff, Stanstead Co.....	
Gauthier, Dorila.....	La Décharge, Chicoutimi Co.....	Bourget township
Gauthier, Huguel.....	Katevale, Stanstead Co.....	Hatley township
Gauthier, J. O.....	Taschereau (Abitibi).....	Launay township
Gauthier, Raoul.....	Fontainebleau, Wolfe Co.....	Weedon township
Germain, Frs.....	Pont Rouge.....	
Gilbert, F. L.....	East Angus, Compton Co.....	Westbury township
Girard, Omer.....	Ste-Monique, Nicolet Co.....	
Goddard, Henri.....	Labelle, Labelle Co.....	Joly township
Goodfellow, Jim.....	R.R. No. 3, Sherbrooke.....	Orford township
Gosselin & Gosselin.....	Chicoutimi.....	Chicoutimi
Goyer, Edouard.....	St-Bruno, Chambly Co.....	
Graham, John.....	Sawyerville.....	
Grandmaître, Donat.....	19 Olmstead North, Eastview, Ont.....	Hull township
Granger, Idège.....	Ste-Marie Salomé, Montcalm Co.....	
Gravel, Lucien.....	East Broughton, Beauce Co.....	
Griffin, Dennis.....	Ste-Rose-du-Dégel, Témiscouata.....	
Guay, Hubert.....	R.R. No. 1, Lauzon.....	
Haines, James.....	Oak Bay Mills, Bonaventure Co.....	
Hébert, A.....	R.R. No. 2, Richmond.....	
Hébert, Ernest.....	Ste-Marie, Beauce Co.....	
Houde, Noé.....	St-Apollinaire, Lotbinière Co.....	
Isabelle, Alfred.....	Stornoway, Compton Co.....	Winslow township
Isabelle, Joseph.....	D'Israeli.....	
Jones, William.....	Dunham, Brôme Co.....	
Julien, Nap.....	St-Alexis-des-Monts, Maskinongé Co.....	
Labbé, Joseph.....	St-Charles, Bellechasse Co.....	
Labelle, Léandre.....	Rivière Beaudet, Soulange Co.....	
Labelle, Salomon.....	Châte Rouge, Gatineau Co.....	Lytton township
Laberge, J. B.....	Ste-Foy.....	

SAND and GRAVEL—Continued

NAME OF OPERATOR	ADDRESS	LOCATION OF PTT
Labonté, Treffé	L'Avenir, Drummond Co.	
Labrecque, Ferdinand	Ste-Rose-de-Watford, Dorchester Co.	
Lacombe, Joseph	St-Elie-de-Caxton, St-Maurice Co.	
Lacroix, Ernest	St-Gérard, Wolfe Co.	
Lafontaine, Cyrille	St-Damien, Bellechasse Co.	
Lafontaine, Eugène	Messines, Gatineau Co.	
Lafrenière, Joseph	St-Charles-de-Mandeville, Berthier Co.	
Lajeunesse, Félix	Rapide de l'Original, Labelle Co.	
Lalancette, Marcel	St-Ambroise, Chicoutimi Co.	
Laliberté, Arthur	St-Isidore, Dorchester Co.	
Laliberte, Joseph	St-Claire, Dorchester Co.	
Lamarche, Azarie	St-Christine, Bagot Co.	
Lamothe, A.	St-Wenceslas, Nicolet Co.	Aston township
Lamothe, Philippe	St-Nazaire-d'Acton, Bagot Co.	
Landry, Eugénie & Rose de Lima	Hemmingford, Huntingdon Co.	Hemmingford township
Langlois, Louis	La Patrie, Compton Co.	
Lapierre, Ernest	St-Pierre-l'Ermite, L'Assomption Co.	
Laplante, Philius	St-Séverin, Beauce Co.	
Lapointe, Cédéon	St-Magloire, Bellechasse Co.	
Laquerre, Patrice	St-Casimir, Portneuf Co.	
Larochelle, Arthur	St-Philémon, Bellechasse Co.	
Larose, Damase	St-Ferdinand, Mégantic Co.	
Latour, Emery	Roxton Falls, Shefford Co.	Roxton township
Latulippe, E.	St-Louis-de-Patendre, Lévis Co.	
Latulippe, Philippe & Amédée	238 de la Ronde, Quebec.	St-Charles River.
Lauzon, Armand	R. R. No. 1, Terrebonne	
Lauzon, Josaphat	Labelle, Labelle Co.	Joly township
Lavallée, Philius	St-Gabriel-de-Brandon, Berthier Co.	Brandon township
Lavigne, Nap.	Paquet, Compton Co.	Hereford township
Lavoie, Isidore	St-Donat, Montcalm Co.	Lussier township
Lebeau, Mrs. Antoine	222 Lebeau Street, St-Jérôme, Terrebonne Co.	
Lebel, André-A.	Squatteck, Témiscouata Co.	St-Jérôme
Lebel, H. E.	St-Félix-de-Kingsey, Drummond Co.	Robitaille township
Leblanc, Joseph	L'Acadie	Kingsey township
Leduc, Ludger	Ste-Anne-de-la-Pérade, Champlain Co.	
Lefebvre, Donat	St-Alban, Portneuf Co.	St-Alban
Lehoullier, Alphonse	St-Marguerite, Dorchester Co.	
Lemay, René	St-Jérôme, Terrebonne Co.	St-Jérôme
Lepage, Ambrise	St-Côme, Joliette Co.	Cathcart township
Lessard, Alphonse	Mansonville, Brôme Co.	
Lessard, Emile	Broughton Station, Beauce Co.	
Lessard, Johnny	St-Victor-de-Tring, Beauce Co.	
Lessard, Majorique	Ste-Rose-de-Watford, Dorchester Co.	Watford township
Lethiecq, David	Béancourt, Nicolet Co.	
Levellé, Armand	Mont St-Michel, Labelle Co.	Décarie township
Levesque, Armand	Roberval, Roberval Co.	
Levesque, Pierre	Fugèreville, Témiscamingue Co.	Laverlochère township
Lockwood, John W.	Asbestos, Richmond Co.	Shipton township
Lord, Cléophas	St-Cyrille, L'Islet Co.	
Lussier, Hormidas	St-Gérard, Wolfe Co.	
McGibbon A.	Brownsburg	Chatham township
McGowan, F. J.	Georgeville, Stanstead Co.	
McKay, Robert	Danville, Richmond Co.	Shipton township
McKee, Frank	McKee, Pontiac Co.	Bristol township
McRichie, Donald L.	Scotstown, Compton Co.	
Maher, Thomas	Frampton, Dorchester Co.	Frampton township
Mahoney, Mike	88 Bank Street, Ottawa, Ont.	Buckingham township
Mailhot, Chas. Edouard	Gentilly, Nicolet Co.	
Mallory, James J.	Lennoxville	
Manson, N. V.	Mansonville, Brôme Co.	
Marchand, Euclide	Almaville, Champlain Co.	
Marcotte, Alfred	Portneuf Station, Portneuf Co.	
Marcotte, Ed.	Cap Santé, Portneuf Co.	
Masse, Alfred	St-Louis-de-Kamouraska	
Matheson, J. L.	Gould, Compton Co.	Lingwick township
Matheson, M. A.	Gould, Compton Co.	Lingwick township
Matthews, A. H.	Lake Beauport	Lake Beauport
Mercure, Alfred	Ange-Gardien, Rouville Co.	
Michaud, Wilfrid	Ste-Ursule, Maskinongé Co.	
Molloy, Richard	Gignac, Bonaventure Co.	
Moncion, Emile	Masson, Hull Co.	Templeton township
Montigny, Georges	East Clifton, Compton Co.	
Moreau, Oscar	Tingwick, Arthabaska Co.	
Moreau, Rodolphe	Peinte Gatineau, Hull Co.	
Moré, Louis	St-Sylvestre, Lotbinière Co.	
Morin, Antoine	Notre-Dame-de-Pontmain, Labelle Co.	
Morin, Donat	Ham Nord, Wolfe Co.	

SAND and GRAVEL—Continued

NAME OF OPERATOR	ADDRESS	LOCATION OF PIT
Morin, J. E.	Trenholm, Drummond Co.	Kingsey township
Morin, Louis	St-Henri, Lévis Co.	
Morin, Nap. Thomas	R.R. No. 5, Lachute	
Morin, Pierre	Notre-Dame-des-Bois, Frontenac Co.	Chesham township
Morin, Roméo	St-Charles-de-Mandeville, Berthier Co.	
Morissette, Ulric	Portneuf Station, Portneuf Co.	
Morris, John	Wilson's Corners, Gatineau Co.	Wakefield township
Morrison, M. R.	Scotstown, Compton Co.	Hampden township
Moulton, C. W.	Hatley, Stanstead Co.	Stanstead township
Muldoon, James H.	Tingwick, Arthabaska Co.	Tingwick township
Myles, Peter	McKee, Pontiac Co.	Bristol township
National Sand & Material Company, Limited	402 Harbour Building, Toronto, Ont.	
Naud, Emilien	St-Alban, Portneuf Co.	
Nault, J. B.	Maniwaki, Gatineau Co.	Egan township
Neveu, Lucien	St-Guillaume-d'Upton, Yamaska Co.	
Newton, Wellington	Buckingham	Buckingham township
Noel, Appollinaire	St-Apollinaire, Lotbinière Co.	
Nolet, Eugène	Ham Nord, Wolfe Co.	
Nolette, Lucien	St-Ferdinand, Mégantic Co.	Halifax township
Ouellet, Walter	Baie Ste-Catherine	
Ouellette, Damase	Ste-Foy Parish	
Ouellette, Philippe	R.R. No. 4, Magog, Stanstead Co.	
Paquet, Adjuitor	St-Etienne-des-Grès, St-Maurice Co.	
Paquin, Adjuitor	Belcourt (Abitibi)	Senneterre township
Paré, Thomas	St-Jules, Beauce Co.	
Parent, Adrien	Roxton Falls, Shefford Co.	
Pariseau, Joseph	R.R. No. 1, Rock Forest, Sherbrooke	
Parker, Albert M.	R.R. No. 3, North Hatley, Stanstead Co.	Ascot township
Patenaude, Elie	Lacolle, St-Jean Co.	
Payeur, Polycarpe	St-Pierre Baptiste, Mégantic Co.	
Pélessier, J. R.	Wilson's Corners, Gatineau Co.	
Péloquin, Walter	L'Avenir, Drummond Co.	
Pépin, Léon	Valcourt, Shefford Co.	
Perrault, Félix	Ste-Marie-de-Beauce	
Perreault, Médéric	La Barrière, Berthier Co.	
Perron, Mrs. Eugène	Ste-Anne-de-la-Pérade, Champlain Co.	
Perron, Ludger	Val Paquin, Gatineau Co.	Portland township
Picard, Wilfrid	Ravignan, Dorchester Co.	Langevin township
Pinard, Donat	St-Rémi-de-Tingwick, Arthabaska Co.	
Pitre, Clément	St-Benoît-de-Matapédia, Bonaventure Co.	Matapédia township
Plante, Etienne	St-Isidore, Dorchester Co.	
Plouffe, Omer	Otter Lake, Pontiac Co.	Leslie township
Plourde, Ovila	St-Wenceslas, Nicolet Co.	
Poirier, Alphonse	St-Anaclet, Rimouski Co.	
Pomerleau, Joseph	Lime Ridge, Wolfe Co.	Dudswell township
Potvin, Thomas	Nomingue, Labelle Co.	Loranger township
Poulin, Alphonse	Ste-Croix, Lotbinière Co.	
Pouliot, Onésime	St-Damien, Bellechasse Co.	Buckland township
Pouliot, Philias	St-Anselme, Dorchester Co.	
Prieur, L. Philippe	Dalhousie Station, Vaudreuil Co.	
Proulx, Anaclet	Julien, Portneuf Co.	
Quebec Central Railway Co.	89 Wellington Street, Sherbrooke	St-Camille township
Quebec Roads Department	Parliament Buildings, Quebec	
Quévillon, Ernest	Mont St-Michel, Labelle Co.	
Quinn, B. & Co., Reg'd	Windsor	
Racicot, Adélar	Roxton Falls, Shefford Co.	
Raymond, Adélar	Ste-Séraphine, Arthabaska Co.	
Raymond, Ernest	Notre-Dame-de-Pontmain, Labelle Co.	Wabasse township
Raymond, J. B.	St-Denis, Kamouraska Co.	
Reed, Edmond	South Durham, Drummond Co.	
Richardson, D.	Ayer's Cliff, Stanstead Co.	
Rivard, Noé	St-Elie-d'Orford, Sherbrooke Co.	
Rivard, Ubald	Stratford Centre, Wolfe Co.	
Roberge, Damase	St-Rémi-de-Tingwick, Arthabaska Co.	Tingwick township
Roberge, Gustave	St-Stanislas, Champlain Co.	
Robert, Pierre	Royal Avenue, Beauport	Beauport
Roberval & Saguenay R'y Co. (The)	Davis Street, Arvida	Jonquière
Robitaille, Charles	Buckingham	Buckingham township
Rodger, David J.	R.R. No. 1, Lachute	
Rouleau, Arthur	Sacré-Coeur-de-Marie, Mégantic Co.	
Roulier, Arsène	L'Acadie, St-Jean-d'Iberville Co.	
Roux, Irénée	Richmond	
Row, Patrick	Masson, Papineau Co.	Buckingham township
Roy, Arthur	Village St-Romuald, Lévis Co.	
Roy, Cyrias	Fradetteville, Bellechasse Co.	

SAND and GRAVEL—Continued

NAME OF OPERATOR	ADDRESS	LOCATION OF PIT
Roy, Joseph.....	Notre-Dame-du-Sacré-Coeur, Richmond Co.	
Ste-Agathe-des-Monts, City of.....	Ste-Agathe-des-Monts, Terrebonne Co.	Beresford township
St-Germain, Mrs. L.....	St-Edwidge, Compton Co.	
St-Laurent, W. E.....	Scotstown, Compton Co.	
St-Louis, Maurice.....	Ste-Seraphine, Arthabaska Co.	
St-Martin, Camille.....	St-Nazaire-d'Acton, Bagot Co.	
St-Pierre, Evariste.....	Laurierville, Mégantic Co.	Inverness township
St-Pierre, Félicien.....	Notre-Dame-du-Bon-Conseil, Drummond Co.	
Saindon, Alfred.....	St-Modeste, Rivière-du-Loup Co.	Whitworth township
Samson, Alexandre.....	Ste-Rose-de-Watford, Dorchester Co.	Watford township
Savard, Edmond.....	Ste-Félicité, Matane Co.	St-Denis township
Savard, Ludger.....	St-Ambroise, Chicoutimi Co.	Bourget township
Semple, Walter.....	Hemmingford, Huntingdon Co.	Hemmingford township
Shaw, W. T.....	St-Félix-de-Kingsey, Drummond Co.	
Shea, Dennis J.....	Fort Coulonge, Pontiac Co.	Mansfield township
Sherbrooke, The City of.....	c/o Thos. Tremblay, City Engineer, Sherbrooke.	Orford township
Simoneau, Albert.....	R. R. No. 3, Ayer's Cliff, Stanstead Co.	
Smith, B. M.....	L'Avenir, Drummond Co.	Durham township
Sorel Harbour Tugs, Limited.....	St-Joseph-de-Sorel.	St-Francis River
Soucy, William.....	Ste-Rose-du-Déglé, Témiscouata Co.	
Soulard, Antonio.....	St-Augustin.	
Standard Lime Company, Limited.....	Joliette.	Ste-Emélie & L'Epiphanie
Standard Sand and Gravel, Limited.....	St-Félix-de-Valois.	St-Félix-de-Valois
Sylvain, Tréfilé.....	St-Séverin, Beauce Co.	
Tétreault, Emile.....	Rang Chartier, Mont-St-Gregoire.	
Tétreault, Nap.....	Sutton, Brôme Co.	
Thériault, E.....	St-Roch-des-Aulnaies, L'Islet Co.	
Thériault, Lucien.....	Deleage, Gatineau Co.	Kensington township
Therreaux, Mrs. George.....	Cap de la Madeleine Centre.	
Thibault, Donat.....	Howick, Chateauguay Co.	
Thibault, Origène.....	Mont-Laurier, Labelle Co.	
Thibert, Tréfilé.....	Ste-Philomène, Chateauguay Co.	
Todd, Wm.....	R. R. No. 4, Lachute.	
Touchette, Arthur.....	Ste-Thérèse, Terrebonne Co.	
Tremblay, Emery.....	5633 Côte des Neiges, Montreal.	
Tremblay, Johnny.....	Grande-Baie, Chicoutimi Co.	Almaville
Tremblay, Joseph.....	St-Marc-de-Shawinigan-Falls.	Tremblay township
Tremblay, Ludger.....	Ste-Anne-de-Chicoutimi.	
Trépanier, Wilson.....	Lac à la Tortue, Champlain Co.	
Trottier, L. O.....	633 Bonaventure Street, Trois-Rivières	
Troversy, Etienne.....	Notre-Dame-de-Pierreville, Yamaska Co.	
Trudel, Donat O.....	St-Stanislas, Champlain Co.	
Turcotte, Alphonse.....	Notre-Dame-de-Rimouski, Rimouski Co.	
Turcotte, Siméon.....	St-Rémi-de-Tingwick, Arthabaska Co.	
Turenne, Delphis.....	St-Eugène-de-Grantham, Drummond Co.	Grantham township
Turgeon, Léon.....	Notre-Dame-du-Bon-Conseil, Drummond Co.	Wendover township
Turmel, Joseph.....	Lac Etchemin, Dorchester Co.	
Turmel, Sauveur.....	St-Anselme, Dorchester Co.	
Valiquette, Armand.....	Labelle, Labelle Co.	
Vallée, A.....	16 Putman Street, Ottawa, Ont.	Hull
Adam, Timothée.....	Roxton Falls.	
Vanier, Mrs. Arthur.....	Ste-Thérèse, Terrebonne Co.	Ste-Thérèse-de-Blainville
Viel, Antoine.....	Squatteck, Témiscouata Co.	Robitaille township
Vigneux, Arthur.....	Wotton, Wolfe Co.	Wotton township
Vileneuve, Hilaire.....	Canton Bégin, Chicoutimi Co.	Bégin township
Watchorn, Edward.....	Morin Heights, Argenteuil Co.	
Weston, F. C.....	Marbleton, Wolfe Co.	Dudswell township
Wheeler, L. E.....	Greenlay, Richmond Co.	Brompton township
Wilson, E. J.....	Brôme, Brôme Co.	
Wilson, James.....	R. R. No. 4, Danville, Richmond Co.	Tingwick township
Wright, Joseph.....	St-Pierre-Baptiste, Mégantic Co.	
Young, C. A.....	Greenlay, Richmond Co.	Brompton township
Young, C. P.....	Hatley, Stanstead Co.	Hatley township

SAND-LIME BRICK

NAME OF OPERATOR	ADDRESS	LOCATION OF PLANT
Canadian Carborundum Company.....	Shawinigan Falls.....	St-Canut
Standard Lime Company, Limited.....	Joliette.....	Montreal

SANDSTONE

NAME OF OPERATOR	ADDRESS	LOCATION OF QUARRY
Beauharnois Light, Heat, & Power Co.	Power Building, Montreal.....	St-Louis-de-Pintendre & St-Nicholas
Blais (Jos), Enrg.....	10 Mont-Marie Avenue, Lévis.....	
Cloutier, Emile.....	L'Islet.....	Ste-Foy
Corrigan, Jos.....	St-Louis Road, Sillery.....	
Montmagny, Ville de.....	Montmagny.....	Montmagny
Rousseau, T. E.....	48 Second Avenue, Quebec.....	New Carlisle and Leggatt's Point
Sherbrooke, City of.....	c/o Mr. Thos. Tremblay, City Engineer, Sherbrooke.....	Ascot township
Vézina (Joseph), Enrg.....	Bergerville.....	Ste-Foy parish

SLATE and SHALE

NAME OF OPERATOR	ADDRESS	LOCATION OF QUARRY
Brique Citadelle, Ltéc (La).....	14 St. Joseph Street, Quebec.....	Lauzon
Broughton Soapstone & Quarry Co., Ltd.....	Broughton Station.....	Ste-Hénéline
Davis Slate & Manufacturing Co. of Canada, Ltd.....	131 Shaftesbury Avenue, Toronto, Ont.	Seigniory of Temiscouata
Taylor, John.....	R. R. No. 4, Granby.....	





A.—O'Brien Cadillac Gold Mines, Limited, Cadillac township, March 1937.



B.—O'Brien Cadillac Gold Mines, Limited, Roasting Plant, March 1937.



A.—Lamaque Gold Mines, Bourlamaque township.
Shafts No. 6 and No. 7, March 1937.



B.—Mooshla Gold Mines, Limited, Bousquet township, October 1936.

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