RP 156(A)

GENERAL REPORT OF THE MINISTER OF MINES OF THE PROVINCE OF QUEBEC FOR THE YEAR ENDING JUNE 30TH 1940

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OF THE

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FOR THE YEAR ENDING JUNE 30TH

1940

P. R. No. 156

Quebec, October 1st, 1940.

To the Honourable

Major-General Sir Eugène Fiset, Kt.,C.M.G.,D.S.O.,M.D.,

Lieutenant-Governor of the Province of Quebec.

Sir:-

I have the honour to submit to you the report on the activities of the Bureau of Mines during the fiscal year 1939-40.

We have the honour to be, Sir,

Your obedient servant,

Edgar Rochette,
Minister of Mines.

REPORT OF THE BUREAU OF MINES OF THE PROVINCE OF QUEBEC

FOR THE FISCAL YEAR 1939-40

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DEPARTMENT OF MINES

Province of Quebec

BUREAU OF MINES

Report of the Director for the Fiscal Year Ending

June 30th, 1940

To the Honourable Edgar Rochette, K.C.,
Minister of Mines,
Quebec.

Sir:-

In accordance with the provision of Section 183 of the Quebec Mining Law, I beg to transmit to you the report on the Mining Industry of the Province of Quebec, and on the activities of the Quebec Bureau of Mines during the Fiscal Year ended on June 30th, 1940.

The Annual Report of the Bureau of Mines entitled "The Mining Industry of the Province of Quebec for the Calendar Year 1939" contains the complete figures of production of our mines and quarries during that year, as well as a detailed review of the Industry and brief descriptions of the development work and improvements carried out at most of the important Quebec mines in the course of 1939. Consequently, the present report will principally deal with the first half of the year 1940, since the above mentioned report for 1939 covers the first half of the fiscal year 1939-40.

The year 1939 was a prosperous one for the mining industry of Quebec. The total value of the production of the mines and quarries reached an all time high of $77,369,703, and although the opening of hostilities on the continent of Europe in September created a certain disturbance, the mining industry quickly responded to the increased demand for metals and various war minerals, and by December the mines had adapted themselves to the new conditions.

The production both of metals and of non-metallic substances was very active, and each in 1939 attained a new high of all times. In the non-metallics, all the important items of the industrial minerals showed substantial increases. As to metals the total value was 10.3 per cent higher in 1939 than in 1938, gold, copper and zinc being the main contributors.

The building materials class still lagged behing in 1939. The total value for the year was below normal, although slightly higher than for 1938.

MINING OPERATIONS AND DEVELOPMENT DURING THE PERIOD JANUARY 1st TO JUNE 30th, 1940

During the first half of 1940, under the stimulus of war demands, all industries have been active, and the production of metals and of non-metallic minerals has been appreciably higher than for the corresponding period of 1939; in point of value, gold and asbestos retain their respective rank of first and second in the list of mineral products. The building industry has improved and is regaining much of the ground it had lost in the previous six years. The production of cement for the first half of 1940 has been the highest, for the corresponding period, since 1931.

TABLE I

Production of some of the principal mineral substance of the Province of Quebec, during the first half of the years 1939 and 1940

Substances	January 1st to June 30th			
	1939		1940	
	Quantity	Value	Quantity	Value
Silver..... ounces	544,919	$ 233,236	608,145	$ 232,749
Gold..... ounces	482,616	16,970,227	497,333	19,147,320
Asbestos..... tons	144,582	6,049,652	156,457	6,923,546
Building materials (estimated)		3,550,000		4,700,000

Table I presents the quantities of precious metals, of asbestos, and of some of the building materials produced during the first half of 1939 and of 1940 respectively. They show a well sustained progress of the Quebec mineral industry and in all likelyhood the total figures for 1940 will reach a new high record.

It is specially gratifying to see that the production of building materials is gaining ground. After lagging behind for eight years the figures are again approaching normality.

However it is well to bear in mind the influence which the present war has on the advance of our mineral industry, and to realize that a large part is due to the demands of a replacement caused by destruction, rather than to healthy industrial conditions. War industries are essentially of a temporary nature and their activities bring about a factitious prosperity which is not lasting, because their objective is not the construction of normal economic conditions. While the mineral industry may be activated by the production of war materials, it is well to remember that this activity will, without doubt, be followed by a difficult period of readjustment for which we should prepare in advance.

The following notes are mostly compiled from the periodical reports, received at the Bureau of Mines, from the inspectors of mines.

METAL MINING

Base Metal Mines

During the first six months of 1940, the output from Western Quebec's copper mines was sustained at a high level. Noranda mines, Limited, continued to lead the Quebec producers. The sinking of an internal shaft at the Horne mine, with the 5,000-foot horizon as the immediate objective, is under way. Waite Amulet Mines, Limited, increased its mill tonnage to about 1,000 tons daily from which are produced a copper concentrate and a zinc concentrate, with most of the ore coming from its Waite Section and an increasingly greater portion coming from the Amulet mine, where development of the lower "A" orebody is nearing completion. Operation of the Aldermac mine continued on a basis of 1,000 tons of ore daily, and the copper concentrate is now shipped to Noranda for treatment, instead of being sent to outside points. Lower level developments at the Normetal mine have been very encouraging, but operations have been handicapped by an inadequate supply of hydro-electric power.

Calumet Mines, Limited, continued the development of the zinc and lead ore deposits on Calumet Island, in the lower Ottawa river, fifty miles above the city of Hull. The details of the work done, and some of its results, were given under the heading "Zinc" of the annual

publication of the Quebec Bureau of Mines entitled "The Mining Industry of the Province of Quebec in 1939".

While no production of chromite was reported during the first half of 1940, there was a renewal of interest in the chrome deposits of the Eastern Townships. In July 1940, Messrs. Tancrède Labbé and L.C. Pharo had several men doing some mining work on a chromite occurence on lot 7, range X, of Coleraine. Two pits of twelve feet diameter, 10 and 20 feet deep respectively, twenty feet apart, showed the presence of some disseminated chromite. From these excavations a few tons of ore has been collected into a heap near the workings. Mr. Bruce H. Fletcher of Sherbrooke is doing some exploration work on several chromite properties in Orford township which are the property of Fletcher Corporation, Limited, of Sherbrooke, mostly on lot 2, range XII of Orford township where a chromite deposit was worked during the European war 1914-18. The pit, 25 feet in diameter and 40 feet deep has been unwatered, and in the bottom there are indications of high grade ore. Prospecting was also carried out on lot 7, range XII, lot 5, range XI, also in Orford, and lot 28, range X, of Brompton. All these deposits are between Little Lake Brompton and Webster lake, a distance of five miles, north and south, separating the two extreme prospects. This ground offers good possibilities of chromite mineralization.

Quyon Molybdenite Company, which succeeded the Wood Mining Company in the ownership of the Moss mine in Onslow township, restored the mining plant and proceeded to the unwatering of the workings. In the spring of 1940 the erection of a building for a 100-ton mill was started, and in May it was reported that the machinery was being set up.

Some exploration work was carried out on lots 18 and 19, range IX, of Gayhurst township, on a molybdenite occurence, by Louis Lefebvre of St. Samuel de Frontenac. Trenching and stripping are said to have revealed the presence of disseminated molybdenite in an area of at least 500 feet radius.

In June 1940, G.M. Morrison had four men at work clearing, and timbering where needed, the adit of the old antimony mine, lot 56, range I, South Ham township, for the Reed Realties, Limited, to give access to the stibnite deposit in the underground workings, in order to sample the vein and do exploratory work. This deposit was first mentioned in the Geology of Canada 1863, and attempts to exploit it were made in the decade of 1880, by a shaft 100 feet deep and underground workings.

Gold Mines

The gold-quartz mining industry continued to expand. The Lamaque mine headed the straight-gold producers with an output of over 1,200 tons of ore daily. East Malartic increased its output to over 1,500 tons daily. The Beattie mine remained at a steady rate of 1,750 tons per day. Promising developments at the Sigma mine have resulted in continued expansion and the mill is now treating 750 tons of ore daily. The development of new veins in the Siscoe mine has materially improved the outlook for this important producer, and operations are proceeding at a steady rate. Underground exploration work at the Perron mine has also been rewarded with the discovery of several new lenses of ore, and production was stepped up to over 375 tons per day. Operations at the Canadian Malartic mine and the Sladen Malartic mine were continued at a steady rate. The mill at Malartic Gold Fields, began operating in January, and was quickly brought up to its rated capacity of 400 tons daily The Sullivan mine and mill continued to operate on a basis of about 350 tons daily.

In the Cadillac belt, the Lapa Cadillac and Amm Gold Mines were in continuous operation on low-grade ores. Central Cadillac is using the mill on the Thompson Cadillac property, for treatment of its ores. The Wood Cadillac mine was brought into production towards the close of 1939, and it is now on a basis of 200 tons per day. The O'Brien mine continues to produce the highest grade ore of any gold mine in Western Quebec, at the rate of about 200 tons daily. Development of the north ore-zone at the Francoeur mine has added materially to the ore reserves, both in tonnage and grade. Operations at the Arntfield mine continued with little change. Powell Rouyn Gold Mines, Limited, commenced the erection of a 350-ton cyanide mill for the treatment of a part of the mine output; the remainder will continue to be trucked to the smelter at Noranda. The Stadacona Rouyn mine continued under the control of a trustee, and operations have shown an improvement in recent months. Additional equipment was set up in the McWatters mill to bring the capacity up to 150 tons daily, and it is now treating ore at that rate. Stoping of narrow high-grade veins continued at the Mooshla mine, and the sorted ore was shipped to the smelter at Noranda. The Cournor Mining Corporation, operating both the Beaufor and Cournor mines, increased tonnage and grade. Underground developments at the Belleterre mine, in Guillet township, have been very encouraging, and indicate a long life for this property.

Prospecting was at a low ebb as a result of war conditions, but exploratory work was continued at a number of promising properties in the district. Underground work was resumed at the Cassels Duval property, by Micmac Mines, Limited, and the mine was supplied

TABLE II

Gold and Silver Production, January 1st to June 30th 1940

Operator	Ore Milled tons	Gold (ounces)	Silver (ounces)
Aldermac	181,902	961	38,868
Amm Gold	30,471	3,788	540
Arntfield	54,351	4,680	1,046
Beattie	313,660	32,860	5,211
Belleterre	39,485	11,609	898
Canadian Malartic	129,748	14,426	8,366
Central Cadillac	30,957	4,821	470
Claverny	364	40	10
Cournor	47,983	8,406	704
East Malartic	272,699	46,974	9,698
Francoeur	29,451	5,390	-----
Lamaque	221,971	61,711	11,365
Lapa Cadillac	49,550	5,125	287
McWatters	18,158	5,566	481
Malartic Gold Fields	74,542	18,569	286
Mooshla	2,291	2,132	-----
Noranda	1,216,409	118,568	298,442
Normetal	57,801	1,165	130,692
O'Brien	33,970	13,702	1,336
Perron	68,007	24,349	1,325
Powell-Rouyn	103,153	11,775	-----
Sigma	138,649	30,055	5,925
Siscoe	115,658	23,895	1,895
Sladen-Malartic	113,359	11,025	8,491
Stadacona	70,638	8,690	1,432
Sullivan	60,590	14,709	5,097
Waite-Amulet	170,022	5,327	73,985
Wood-Cadillac	35,890	7,015	1,295
TOTAL		497,333	608,145

with hydro-electric power. Flordin Mines, Limited, in Desjardins township, made plans for an extensive underground development campaign, and a steam mining plant was brought in from Senneterre over the winter roads. West Malartic continued underground development work. A promising ore zone is being explored on the National Malartic property, by crosscutting and drifting from the Sladen Malartic mine workings. On several other properties, surface work and diamond drilling were carried on during the period under review.

Alluvial Gold

Embergold Mines, Limited, resumed in January 1940, the underground exploration of its alluvial gold claims in the valley of the Ditton river. The shaft is situated on lot 14, range X, of Ditton township. From January to mid-June, they drove 1300 feet of drifts and cross-cuts, which, added to 1502 feet done previously, makes a total of 2802 feet of galleries.

Moe River Mines, Limited, did some exploration work on their holdings of alluvial gold claims, by prospect pits along the Moe river, on lots 12 to 19, range VIII of Compton township, from August, 1939, to the first of April. Some sampling was done and it is reported that the results were satisfactory.

NON-METALLICS (1)

Non-metallics minerals are now subdivided into "Industrial minerals" and "Building materials"; the latter comprising the non-metallic mineral substances which are used in the various branches of construction, residential, industrial and engineering works: the former includes several substances, other than metallic ones, used in various industries, for example: asbestos, feldspar, mica.

Industrial Minerals

Asbestos (2)

The asbestos mines of the Eastern townships have been very active during the half-year under review. The shipments of fibre for the first six months of 1940 were 156,457 tons, valued at $6,923,546, an appreciable increase over the corresponding period of 1939, which was itself quite high. Mining and milling of asbestos rock proceeded steadily at the various mines throughout the six month period under review.

Asbestos Corporation, Limited, had four mines in operation during the first six months of 1940. The King mine is by far the largest producer of the company. The mining here is done by the block caving method, by underground workings. Mining in the last few months has been proceeding on blocks 502, 507, 508, 510 and 515. At the end of the first six months of 1940 the mining of blocks 502 and 515 was almost completed. During that period, development work was carried out on block 506, 511, 515 and 520. Three auxiliary fans were set up to improve the ventilation in the underground workings, which have been constantly expanding with the development of the "block caving" method of mining. The conditions are now quite satisfactory. At the Beaver mine in Thetford Mines, mining in the open-cast workings proceeded normally and also the development work underground at the 300-ft horizon. At this horizon a haulage way was driven in 1939, to underneath the bottom of the adjoining Bennett-Martin mine, and the two properties are being worked in common, the Beaver mill treating the asbestos rock of both. The Beaver mill is also used for the rock from the former Consolidated mine; the three properties, formerly separate, are now worked conjointly. Both the British Canadian mine at Black Lake, and the Vimy Ridge mine at Coleraine worked steadily without any radical change in their methods of mining.

At the mine of the Bell Asbestos Mines, Limited, No. 2 shaft, which was completed in January 1940, is now in operation. Raises and manways have been put through from the underground workings to the bottom of the open-cast pit, and the asbestos rock is now handled through these ore passes, hauled by the main underground haulage ways and hoisted by No. 2 shaft. In the open-cut workings, the mechanical shovel, locomotives and ore cars have been replaced by scrapers, of the tugger hoist type and of the tractor type.

At the Johnson's Company's mine at Thetford the development work to change the method of mining from open-cast to "block caving" has been actively carried out during the first half of 1940. In June the fringe drifts of block No. 1 were practically finished and it is expected that by the end of the summer, asbestos rock from this block will be treated in the mill. Development work on block No. 6 was started in March and is being carried on actively. In the meantime the mill is supplied with rock from the open workings, and from the underground development work. At the Johnson's Black Lake mine, lot 30, in range B of Coleraine township, mining in the open-pit was carried out steadily and some stripping was done on the adjoining lot 30, in continuation of the exploration and development work begun in 1939.

At Asbestos, the Canadian Johns-Manville Company, Limited, during the spring months reduced their mining operations in the open workings to four or five days a week. The mill also slowed down to the same rate. The plans for the erection of a large fibre shed, 320 ft. by 120, with a steel frame, were being prepared, and also a plan for a freight shed; the intention is to employ on these buildings the men who work part time in the mine and mill. The exploration of the ground towards the southwest, by a tunnel starting from the pit, was continued.

Quebec Asbestos Corporation, East Broughton carried on mining work in the south part of their mine on lot 13, range XII of Broughton township, during the first half of 1940. In April, the mill was stopped for three weeks, and in the mine the work done was mostly of

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(1) Unless otherwise stated the notes on Non-Metallics are by Paul-E. Bourret, of the division of Mineral Deposits.

(2) Notes by L. Lavigne, inspector of mines.

TABLE III

Shipments of Asbestos Fibre, January 1st to June 30th, 1939 and 1940

Grouping of Grades	January 1st to June 30th	
	1939 (Tons)	1940 (Tons)
Crudes	1,319	1,046
Fibres	77,200	87,200
Shorts	66,063	68,211
TOTALS	144,582	156,457

a development nature in driving crosscuts from the main tunnel, and the results have been satisfactory.

At Norbestos, the Nicolet Asbestos Mines, Limited, which had been more or less inactive for some years, resumed steady operations at the mine and at the mill early in May, 1940. The mine and mill are situated on lots 20 and 21, range XI of Tingwick township. At the end of May, the mine was worked in two shifts. Between 65 and 70 men were employed by the Company.

Some prospecting and development work was carried out on several occurences of asbestos-bearing serpentine. The Reed Realties, Limited, in the summer of 1939, opened up an asbestos prospect on lot 18, range IV of Thetford township, near the old Pennington mine which is located on lot 16, range IV. In May 1940, J.A. Jacob took an option on this Reed Realties' prospect and did further exploration by stripping and trenching, preliminary to do some diamond drilling. H. Bruce Fletcher, of Sherbrooke, did further stripping on an asbestos prospect on lot 30, range IX of Brompton township, in continuation of the exploration work carried out during the summer of 1939.

Feldspar

The production of feldspar during the first six months of 1940 is estimated at 3752 tons against 1733 tons during the first half of 1939. Increases were recorded in the shipments of both crude and pulverized feldspar. The output was derived entirely from the Buckingham district in Papineau county.

Garnet

The construction of a concentrator by the Canada Garnet, Limited was completed last spring. Operations were started at the latter end of April and small trial shipments of garnet concentrates were made.

Industrial Lime and Limestone

The quantity of industrial lime and limestone marketed by Quebec producers in the first half of 1940 is the highest on record. The total output of lime was estimated at 106,852 tons against 72,075 tons during the corresponding period of 1939 and against an average of 67,989 tons for the first six months of the years 1935 to 1939.

Magnesitic-dolomite

The mine and the calcining plant of the Canadian Refractories, Limited, at Kilmar in Grenville township have operated at capacity since the beginning of the year. The output of this producer consists of calcined and also of dead burnt magnesite used mainly for the manufacture of refractory products.

The International Magnesite Company, in Harrington township, produced crude magnesite and also calcined products.

Mica

Mica, which is regarded as a war mineral, is in great demand. Shipments were considerably greater than in 1939. The output was derived from mica mines located in the Gatineau and Lièvre rivers valleys and also to a small extent from the Saguenay district.

Iron oxides

The output consist of crude iron oxide used for the purification of coal gas extracted from deposits located in the Trois-Rivières area and also of iron oxide calcined at Red Mill, Champlain county by the Sherwin-Williams Company of Canada, Limited, the latter being used as pigment in paint manufacturing. In the fall of 1939, two furnaces were added to the Red Mill plant thereby increasing its capacity by twenty per cent.

Silica

A large tonnage of quartz and crushed sandstone was produced in mines and quarries of Quebec during the first half of the year. These materials are used mainly as an ingredient for the production of glass, carborundum, and ferro-silicon, they are used also as abrasives and as flux in the electro-chemical industry. East Templeton, Buckingham, St-Rémi d'Amherst, Beauharnois and St. Canut are the chief producing centres. In the spring of 1940, an acid leaching unit was added to the grinding and washing plant of the Ottawa Silica and Sandstone Company at East Templeton. It is expected that the leached product will be sufficiently low in iron to render it suitable for the manufacture of glass.

On April 18th, the plant of the Canadian Kaolin Silica Products, Limited, at St. Rémi d'Amherst, was completely destroyed by fire. This plant had a rated capacity of 500 tons of pulverized silica per day and was the largest in the Province of Quebec.

Peat (1)

In the Province of Quebec some of the numerous peat bogs are worked for the production of peat moss. There is no production of peat fuel. The production of peat moss is not very large, but it is steadily increasing. In 1938 the value of peat moss products was $16,518, and in 1939 it was $23,914.

The main producers of peat moss are Premier Peat Moss, Limited, Isle-Verte; F.X. Lambert, Rivière Ouelle; Waterville Moss and Peat Mines, Waterville, all in the Province of Quebec. From all appearances the production in 1940 will be notably higher than in 1939. Canada Peat, Limited opened up a deposit of peat at Rivière-du-Loup. Drainage and sods cutting has been proceeding on the bog. A plant is at present under construction for the production of loosened peat-moss and will be in operation later in the year.

Petroleum (2)

The presence of petroleum in Gaspé peninsula has been known for a hundred years. There are seepages of it in many places and it was found in several of the wells that were drilled there in the years following the first attempt in 1860. The main drilling activity was during the last decade of the past century and, after 1903 until recently, only one well was drilled - in 1913. In none of these attempts was oil found in commercial quantity. It is now considered that most of the wells were drilled on unfavourable geological structures and that further attempts are justified in places where more detailed geological investigations have shown the presence of suitable structure. A renewal of interest has been shown in this region and the drilling of a well has been under way during the fiscal year of 1939-1940.

La Compagnie d'Exploration de Gaspé, Limitée, began drilling its Mississippi No.1 well on October 27, 1939, at a location in the southeastern part of Block 35, Larocque township, about three-quarters of a mile east of Dartmouth lake. Some preliminary work, additional to geological reconnaissances, included the construction of a road slightly more than five miles long, leading to the well-site from the main road that follows up the York River valley from Gaspé.

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(1) Notes by Henri Girard, inspector of mines.

(2) Notes by I.W. Jones, chief of division of Geological Surveys.

A wooden, double wind-braced derrick was being employed. It was 84 feet high and, at the base, it was 20 feet square. Drilling was by the cable-tool (Standard) method, with an Imperial Ideal Rig, six-inch Standard Rig Irons, and the power was supplied by a 185 H.P. Diesel Engine.

Up to June 30th, 1940, no serious difficulties were encountered in drilling, but, due to winter conditions, drilling was suspended from January 24 to April 9.

The hole has a diameter of 20 inches from the surface to a depth of 22 feet, 15⅛ inches from 22 feet to 296 feet, 12⅛ inches from 296 to 1665 feet, 10 inches from 1665 feet to 4624 feet, and 8 5/8 inches from 4624 feet to the depth of 4901 feet that was reached in June 30th, 1940. Drilling was being continued after that date.

Casing of the following outside diameters and weights was set to the depths indicated: 16-inch, 52-lb, to 22 feet; 13 3/8-inch, 48-lb, to 296 feet; 10¾-inch, 45-lb to 1665 feet.

Surface water was encountered in a heavy flow at 50-52 feet; another flow of water, at about a rate of 15 gallons per minute, was encountered at 890 feet. Below that depth the hole was dry. Some caving was encountered at depths of 890, 1238, 1644-1648, 1658 (bad cave) and at 2900 feet.

The drilling at this well-site, on the southern flank of what is known as the Mississippi Anticline, began in the Grande Grève formation (Lower Devonian) at a stratigraphic horizon about 2800 feet below the top of that formation. Grande Grève rocks, mostly hard siliceous limestone or calcareous shale, were encountered to a depth of 1240 feet where a transition zone with the succeeding lower formation, Bon Ami (also Lower Devonian), was reached. The Bon Ami, typically a darker softer and more argillaceous limestone than the Grande Grève, extends to a depth of 2610 feet. From 2610 to 3410 feet, some brownish-red and bluish-greenish-grey shales are interbedded with the darker, shaly limestones and calcareous shales. Below 3410 feet, as far down as 4901 feet, the depth reached on June 30, 1940, the rocks are dark argillaceous limestone and calcareous shale, which probably, also are part of the Bon Ami formation. The dip of the rocks at the surface at this site is in the neighbourhood of 20 to 25 degrees towards the south.

Steatite

Five producers marketed steatite and talc products during the first six months of 1940. Four of these operators have their mines and plant located in the Thetford-Broughton area and the other in Brome county. The plant of the Broughton Soapstone Quarry Company, Limited, at East Broughton, and also the pulverizing mill of the Baker Mining and Milling Company, Limited, at Highwater, were in continuous operation during the first half of the year.

BUILDING MATERIALS

The value of building and engineering contracts issued in the Province of Quebec during the first six months of 1940 was $47,804,100 against $28,332,000 in the first half of 1939. The renewal of activity in the building trade, was followed by a notable increase in the production of mineral building materials. The output of cement was 1,227,716 tons against 971,279 tons during the first six months of 1939, and the sales of clay products, which consist mainly of building brick, were valued at $557,102 against $381,824 during the corresponding period of 1939. Increases were also recorded in the production of all the other classes of mineral building materials with the exception of building and monument stone.

MINING TITLES

Tables IV and V give data relating to various mining titles issued by the Bureau of Mines during the fiscal years 1938-39 and 1939-40, and for each year since 1920-21. To these has been added a statement, table VI, of statutory and exploration work done on mining claims and on lands held under development licenses for each of the calendar years 1931 to 1939, and also during the first seven months of 1940. These tables have been compiled by the Administration Division, of which J.X. Mercier is chief.

The tables show that the war activities which at present dominate the economic situation of practically the whole world, have a hindering effect on prospecting, claim staking and development of new mining properties. As compared with the preceding year we note a decrease of 32 per cent in the number of miner's certificates issued; of 30 per cent in the number of claims staked and of 33 per cent in statutory and development work done on mining lands under claim and license. On the other hand all the mines in operation have been producing to capacity.

TABLE IV

Various Titles Issued by the Bureau of Mines, Fiscal Years 1938-39 and 1939-40

Designation of titles	In 1938-39	In 1939-40
Claims recorded, Amos	5,146	3,644
" " Noranda	3,740	2,444
" " Quebec	1,451	1,236
Total	10,337	7,324
Miners' certificates issued	3,221	2,181
Development licenses issued	529	402
Development licenses renewed	2,248	1,918
Mining concessions	7	4
Transfer of titles	830	555
Reports of work, days reported	567,610	497,999
Reports of work, diamond drilling, feet	379,341	277,955
Assay coupons, number delivered	67,851	44,156

TABLE V

Titles Issued Since 1920-21

(Fiscal Years)

Fiscal Year	Number of Miners' Certif.	Number of Claims Recorded	Number of Development Licenses (1)	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	2,239	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	830
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	3,002	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
1936-37	7,099	23,823	2,398	2	990	2,400
1937-38	2,718	12,918	2,932	17	4,089	1,217
1938-39	3,221	10,337	2,777	7	2,123	830
1939-40	2,181	7,324	2,320	4	1,574	555

(1) Prior to June, 1937, these licenses were designated "Mining Licenses".

TABLE VI

Comparative Statement of Exploration Work Performed on Claims and Licenses During the Calendar Years 1931-1940

Calendar Year	Number of Day's Work	Footage of Diamond-Drill Holes
1931	124,050	23,486
1932	184,815	44,873
1933	263,900	49,889
1934	500,502	123,257
1935	543,094	146,425
1936	730,295	202,623
1937	910,088	434,903
1938	774,709	517,587
1939	549,580	299,619
1940 (seven months only)	201,402	142,409

Incorporation of Mining Companies

Forty-six new mining companies were incorporated in 1939. The list is much shorter than in 1938, when the number was 95. This falling off is due to the fact that prospection for new mineral deposits was much less active during 1939 than in the preceding years.

Mining Companies incorporated in the Province of Quebec in 1939

Name of Company	Head Office	Date of Incorporation	Number of Shares	Par value
Benkor Gold Mines (Quebec),Limited	Noranda	March 17th,1939	20,000	$ 1.
Brown-Henn Gold Mines, Limited	Senneterre	July 10th, 1939	99,900	1.
Carrière Brasseur, Limitée (La)	Amos	Feb. 9th, 1939	200	100.
Central Cadillac Mines, Limited	Montreal	April 4th, 1939	4,000,000	1.
Central Mining Corporation	Montreal	June 9th, 1939	1,000,000	1.
Cheabella Mine, Limited	Hull	Nov. 29th, 1939	300,000	1.
Chibougamau General Mining and Transport Company	Montreal	March 22nd,1939	490	100.
Compagnie Générale de Mines et Transport de Chibougamau, Limitée (La)				
Chippewa Prospecting and Development Company, Limited	Senneterre	July 10th, 1939	99,900	1.
Compagnie d'Exploration de Gaspé, Limitée, (La)	Quebec	Sept.12th, 1939	500,000	1.
Compagnie de Mica du Lac St-Jean, Limitée, (La)	Jonquière	Nov. 14th, 1939	199,000	1.
Lake St. John Mica Company, Limited				
Cromar Development Company, Limited	Montreal	April 22nd,1939	250,000	1.
Dome Exploration Company (Quebec),Limited	Bourlamaque	May 3rd, 1939	1,000	100.
Dufay Development Company, Limited	Montreal	Jan 30th, 1939	99,000	1.
Gamma Mines (Quebec), Limited	Bourlamaque	Dec. 18th, 1939	1,000,000	1.
Golden Gachin (Quebec), Limited	Montreal	May 13th, 1939	9,800	5.
Hollinger (Quebec) Exploration Company, Limited	Arntfield	July 18th, 1939	20,000	1.

James Sullivan Mines, Limited (The).....	Montreal....	Dec. 5th, 1939	3,000,000	$ 1.
Joydor Gold Mine, Limited.....	Montreal....	Dec. 12th, 1939	4,000,000	1.
Lemargo Mining Company, Limited.....	Montreal....	Jan. 16th, 1939	49,999	1.
Malartic Contact Mines, Limited.....	Montreal....	Feb. 22nd, 1939	3,000,000	1.
Malartic Consolidated Mines, Limited.....	Quebec.....	July 5th, 1939	3,500,000	1.
Malartic Portage Mines, Limited.....	Montreal....	Feb. 22nd, 1939	3,000,000	1.
Maniwaki Molybdenum Corporation.....	Montreal.....	May 9th, 1939	3,000,000	1.
MicMac Mines, Limited.....	Montreal....	Dec. 22nd, 1939	(3,000,000	1.
			(10,000 (pref.)	100.
Minecreators, Limited.....	Val d'Or....	Feb. 8th, 1939	99,000	1.
Moe River Gold Mines, Limited.....	Moe River...	March 21st, 1939	99,000	1.
Mohawk Mines, Limited.....	Hull.....	Jan. 9th, 1939	4,000,000	1.
Molybdenum Development, Limited.....	Montreal....	March 7th, 1939	250,000	1.
National Diamond Drilling Company, Limited,	Montreal....	May 13th, 1939	20,000	1.
National Malartic Gold Mines, Limited.....	Montreal....	March 9th, 1939	3,500,000	1.
NewRoy Gold Mines (Quebec), Limited.....	Amos.....	Feb. 27th, 1939	4,000	none
Noresca Explorations, Limited.....	Montreal....	Jan. 18th, 1939	99,000	1.
North Malartic Gold Mines, Limited.....	Noranda.....	May 23rd, 1939	3,000,000	1.
Norwin Molybdenite Mines (Quebec), Limited	Montreal....	Oct. 23rd, 1939	20,000	1.
Ora Mines Company.....	Montreal....	Sept. 6th, 1939	3,000,000	1.
Parmont Development and Mining Syndicate, Limited.....	Montreal....	Aug. 28th, 1939	50,000	5.
Par-Tout Explorers, Limited.....	Hull.....	Dec. 5th, 1939	99,000	1.
Pontiac Consolidated Metals, Limited.....	Campbell's Bay.....	Nov. 13th, 1939	99,000	1.
Rambler Gold Syndicate, Limited.....	Canton Rouyn	Aug. 8th, 1939	10,000	none
Ramco Mines, Limited.....	Montreal....	Sept. 14th, 1939	3,000,000	1.
Saturnyte Gold Mines, Limited.....	Canton Bousquet..	Jan. 24th, 1939	3,000,000	1.
Senneville Mining Company, Limited.....	Montreal....	Jan. 24th, 1939	20,000	1.
Touton Mining and Exploration Company.....	Montreal....	Feb. 22nd, 1939	4,000	10.
Trivicour Gold Mines, Limited.....	Montreal....	May 9th, 1939	35,000	1.
West Malartic Mines, Limited.....	Montreal....	Jan. 14th, 1939	3,000,000	1.
Wright Rouyn Gold, Limited.....	Rouyn.....	Feb. 9th, 1939	3,000,000	1.

COLLECTION OF DUES ON MINES

The Division of the Mine Assessor reports that during the fiscal year ending June 30th 1940, forty-one mining companies presented statements of their operations, as required by Division III of the Quebec Mining Act, for the purpose of establishing the annual profits liable for the duties on mines as specified in the mining law.

From this source the Mine Assessor's Division collected $1,338,743.62 during the fiscal year ending June 30th,1940, as compared with $1,208,368.87 during the preceding year. The increase is due to the development of the mining industry, as there was no increase in the rates.

The collection of the acreage tax of ten cents, an acre on mining concessions which are not operated, yielded $1,648.30 from 78 concessions. Moreover we received duly sworn statements from the holders of 66 other concessions to the effect that at least two hundred dollars had been spent in mining work on each concession during the year, this being the statutory condition exempting the property from the acreage tax liability.

MILL SITES

The mining law states that "the place and situation of every smelter, ore mill or refinery erected in the Province of Quebec for the purpose of smelting, treating, or refining ore, minerals or mineral bearing substances shall be chosen, determined or approved by the Lieutenant-Governor in Council". During the fiscal year under review, the sites of three ore-mills were approved. Moreover, in compliance with section 101c of the Mining Law, the operators of these mills obtained the Minister's approval of the place where the refuse and tailing resulting from the operations of these plants, were to be deposited.

The mining law specifies that ores, minerals, and mineral substances from mines in the Province of Quebec, may not be shipped outside of the province for treatment without the approval of the Lieutenant-Governor in Council. One operator was allowed to ship zinc concentrate for treatment outside of the Province.

TABLE VII

COMPARATIVE STATEMENT OF REVENUE COLLECTED BY THE BUREAU OF MINES

(Compiled by Robert Samson, accountant)

	Fiscal Years		
	1937-38	1938-39	1939-40
Miners' certificates	$ 33,500.00	$ 32,244.50	$ 21,560.00
Mining licenses	297,518.28	231,131.57	142,231.20
Penalties	3,459.00	4,363.16	7,600.77
Mining concessions	35,444.62	5,419.95	5,802.61
Transfer of titles	12,170.00	8,300.00	5,240.00
Dues on mining concessions	4,013.63	3,594.56	1,929.55
Dues on village lots	17,061.61	56,732.96	8,087.44
Dues on profits of mines	1,041,765.06	1,208,213.82	1,339,376.24
Miscellaneous			
Sale of maps, blue-prints, etc.	2,126.33	1,592.24	1,198.62
Mineral collections	953.05	971.15	406.15
Assay fees	1,958.38	2,251.20	578.85
TOTALS	$1,449,969.96	$1,554,815.11	$1,534,011.43

GEOLOGICAL FIELD WORK

The geological investigations of the Bureau of Mines are carried out by two divisions, designated respectively, Division of Geological Surveys and Division of Mineral Deposits. Each is under the direction of a competent geologist.

Division of Geological Surveys

Dr. I.W. Jones, Chief of this Division, reports that, during the summer and autumn months of 1939, the Division of Geological Surveys had eight geological investigations under way in various parts of the Province, each in charge of a competent geologist. During their investigations, the geologists gave assistance to prospectors or any others who were interested in the particular regions under review, and, at the close of the field season, they submitted preliminary reports and maps that were made available to the public. In this manner, the main results of the investigations were made known without delay. During the following winter and spring, after further research in their laboratories and offices, the geologists submitted geological maps (on a scale of half-a-mile to one inch), and reports describing the geology and economic possibilities of the areas they had studied.

The investigations made in 1939 and the geologist in charge of them were as follows:

Gaspé County.-

H.W. McGerrigle - Geology of the Malbaie Area, comprising 130 square miles in Malbaie township and the eastern half of Fortin township, This work, which was a continuation of investigations undertaken in neighbouring regions during 1937 and 1938, give particular attention to the oil possibilities of this eastern part of Gaspé.

Saguenay County.-

E. Roch - Geological reconnaissance of Anticosti island, with particular reference to oil possibilities. In this work, Dr. Roch examined a considerable section along the southern shore of this large island and also studied the rocks along many of the southward flowing streams. The advent of war did not permit completion of this study to the extent that had been planned, as Dr. Roch, as soon as hostilities commenced, lost no time in returning to France to join the military service of his country.

C. Faessler - Geology of a region bordering rivière des Rapides and Moisie river. In this investigation, about 450 square miles of territory were mapped, in continuation of similar work that has been in progress for several years along the north side of the St. Lawrence.

Montreal Island

T.H. Clark - Continuation of an investigation begun in 1938 of the geology of Montreal island and adjacent regions.

Labelle County

E. Aubert de la Rue - Geology of the Nomininque - Mont Laurier area, comprising about 350 square miles.

Abitibi County and Abitibi Territory

B.C. Freeman - Geology of the Buteux area. In this investigation of a region in which there are possibilities of finding gold deposits, an area of about 350 square miles was covered in Buteux township and parts of the neighbouring townships of Lacroix, Marceau and unsurveyed townships numbers 119, 120 and 121.

R.L. Milner - Geology of the Barry Lake area. This investigation covered a region of about 390 square miles lying to the west of the Buteux area, in unsurveyed township No. 118 and parts of the townships of Lacroix, Bailly, Barry, Souart and unsurveyed townships Numbers 117 and 119.

Abitibi Territory

W.W. Longley - Geology of a region extending westward from Mattagami lake, forming the western part of the Mattagami - Kitchigama area, the investigation of the eastern part of which was made in 1938. An area of about 460 miles was covered in 1939, in a region which presents some possibilities of finding gold and copper.

Another program of geological investigation was begun towards the end of the fiscal year, and in June of 1940, the Division of Geological Surveys had seven parties in various parts of the Province conducting investigations that are being continued during the fiscal year of 1940-41. The chiefs of the parties and the objects of their work are as follows:

Gaspé County

H.W. McGerrigle - Geology of Power township and the western part Joncas township. This work is a continuation of the investigations undertaken in Gaspé peninsula during previous years and it fills the gap between work done in 1936 (Mount Alexander area) and in 1938 (Joncas-Fortin area).

Saguenay County

E.W. Greig - Geology of the region east of Matamec river and north of the St. Lawrence, a continuation of the investigation of that vast region known as the "North Shore".

Montreal Island

T.H. Clark - Continuation of the geological investigation of Montreal and vicinity.

Labelle and Gatineau Counties

E. Aubert de la Rue - Geology of a region west and northwest of Mont Laurier, forming part of a program that has been under way for some years which has for object to investigate the region bordering the Montreal-Senneterre highway.

Abitibi County

W.W. Longley - Geology of a region bordering and lying east of Bell river in Laas, Tonnancourt, Holmes and Cuvillier townships, filling the gap between areas investigated in 1935 (Josselin-Delestre), and those examined in 1936 (Grevet) and 1937 (Lower Laflamme).

Abitibi Territory

H.W. Fairbairn - Geology of townships 115, 116 and 117, lying on the north side of the boundary between Abitibi county and Abitibi territory and joining areas examined in 1936

(Grevet) and 1939 (Barry Lake).

B.C. Freeman - Geology of a region bordering Bell river about ten miles south of Mattagami lake and connecting work previously done in 1936 (Bruneau area) and 1938-39 (Mattagami-Kitchigama area).

DIVISION OF MINERAL DEPOSITS

The function of this Division is to undertake the study of all question relating to the mineral deposits of the Province, with the object of furthering the development of the mineral industry. Its officers examine mineral discoveries and furnish assistance to the prospector in the form of technical advice; they follow and record the progress of mining exploration and development; and they undertake special technical investigations in areas where there is need for co-ordination of available data. It must also classify this information in such a manner that it may be presented to the public either in the form of published reports or to meet specific demands for information by interested individuals. Dr. Bertrand T. Denis is chief of the Division.

At the close of the 1938-39 fiscal year there were four field parties in the field. The work of these parties was completed as planned and reports have been submitted.

The names of the chiefs of parties and the areas in which the investigations were carried out are as follows:-

Abitibi and Témiscamingue Counties:-

W.G. Robinson - Detailed geology in an area in Beauchastel and Duprat townships.

S.H. Ross - Geological examination of a number of mining properties under development.

Abitibi County:-

P.E. Auger - Detailed geology of a small area in Dubuisson township, including the Siscoe mine.

F.Fitz Osborne - Detailed geology of a small area on Calumet Island and nearby, including the lead-zinc-silver-gold deposit at present being explored by Calumet Mines, Limited. Also preliminary examination of the known brucite deposits of the Province.

Four field parties organized for the 1940 field season were in the field at the close of the 1939-40 fiscal year. These are as follows:-

Abitibi County:-

W.G. Robinson - Detailed geology of the northwest corner of Beauchastel township.

P.E. Auger - Detailed geology of a small area in the southeast quarter of Bourlamaque township.

Abitibi and Témiscamingue Counties:-

S.H. Ross - Geological examination of a number of mining properties under development.

Gaspé North:-

F. Fitz Osborne - Detailed investigation of the copper deposits in Holland township in the vicinity of the headwaters of York river.

In addition to the organized field-parties, P.E. Bourret has been engaged in the examination of deposits of various non-metallic minerals, in the southern part of the Province. During the 1939-40 fiscal year he made 72 such examinations.

Jean Morency, mining engineer, is in charge of a subdivision whose function is to classify the technical information gathered by the department, so that this information may be readily available to the public. Much progress has been made in the systematic classification and indexing of geological and engineering reports, annual reports of operating companies, plans and other technical documents pertaining to mining operations. During the past fiscal year this subdivision has daily been consulted by officers of the Department, and it has also answered 355 requests for written information.

INSPECTION OF MINES

The Inspection of Mines division has two main functions:

1o. To inspect mines, quarries, and sand and gravel pits in the Province, at frequent intervals, to ensure the observance of the Regulations for the Protection of Workmen in Mines and Quarries.

2o. To keep in touch with development, and to report on the progress of the mineral industry of the Province.

The Province is divided into five mine inspection districts, and during the fiscal year under review, five Inspectors of Mines were engages in inspection work. R.H. Taschereau and J.N. Herring supervised this work in the counties of Abitibi and Temiscamingue and in the Abitibi Territory. Lucien Lavigne inspected the mines in the Eastern Townships district from the Richelieu River eastward to Levis and Dorchester counties, inclusive. The territory also included Gatineau, Labelle, Papineau and Argenteuil counties, and the area south of the 46th parallel of latitude in Pontiac county. Henri Girard supervised the Eastern district, comprising the counties east of Joliette on the north of the St-Lawrence, and east of Levis and Dorchester, including the Gaspe peninsula, on the south of the St-Lawrence. Jean de Péron was in charge of inspection work in the mines, quarries and pits in Montreal and the area immediately surrounding.

Two mine constables, stationed at Thetford Mines and Rouyn respectively, assisted the inspectors in various phases of their work, in addition to carrying-out other duties for the Department of Mines.

Throughout the fiscal year, Eugène Larochelle, in addition to his duties as Mine Assessor, supervised the work of the Inspection of Mines Division.

Our inspectors continued to pay special attention to accident prevention measures, and to enlist the cooperation of operators in bringing about more healthful and safer working conditions in the mining industry. In 1939, the fatality rate, based on 300 days exposure, was lower than in any other of the twenty-two preceding years. In addition, the rate of non-fatal accidents showed a substantial improvement.

It may be pointed out that the Inspectors of Mines are qualified mining engineers, and their interest in accident prevention extends beyond the limits of the Mining Regulations. Close observance of these Regulations will reduce to a minimum those accidents resulting from defective equipment, or unsafe working conditions, but it is necessary to instill a spirit of safety-consciousness in every employee in order to obtain a low accident rate, since the large majority of accidents result from carelessness or absent-mindedness.

Two associations, whose aims are to lower the accident rate in mines, have been formed, viz: "The Safety Association of the Quebec Asbestos Producer's Association" and the "Western Quebec Mines Accident Prevention Association". Both of these organizations keep their members closely informed of the trends in modern safety practices.

Reports on all accidents are sent to the inspectors by the operators, and are then forwarded to the Quebec office, where the data are compiled in statistical form. In the case of fatalities, or very serious accidents, the inspector visits the scene of the accident and makes a complete report. Copies of these reports, in French and English, are multigraphed and sent to all managers of mining properties, and to other interested parties.

During the fiscal year 1939-40, the Regulations for the Protection of Workmen in Mines and Quarries were revised, and issued in a compact booklet form with a very complete index.

In order to ensure greater safety in their operations, and closer attention by employees to safety measures, a number of mining companies have supplemented the Quebec mining regulations with additional safety rules. In several cases, the Department has made French translations of company rules, for the benefit of French-speaking employees. A copy of such rules is given to each workman, and it is the practice to ensure that every employee is thoroughly versed in those rules which apply to his work.

The growth of the mining industry has been accompanied by a substantial increase in the use of electricity, but in spite of this fact, the number of electrical accidents continued to be small in proportion to the total accident rate. However, in order to ensure the retention of this high standard, it was deemed advisable to engage the services of an electrical engineer in an advisory capacity to assist the mine inspectors in highly technical problems, and in the study and revision of the regulations applying to the use of electricity

in mines and quarries. For this purpose, the services of Mr. Jules Leblanc, electrical engineer, have been retained by the Department for the equivalent of about four months of each year.

Courses in First Aid to the Injured were held at a number of mines. Instruction was given by the St-Johns Ambulance Association, or by other competent instructors, and, on completion of the courses, examinations were held by qualified medical practitioners. Successful candidates were awarded certificates of competency by the Department of Mines. In the year endind June 30th 1940, 221 certificates were distributed to workers in mines as follows:-

Arntfield Gold Mines, Limited.....	68
Canadian Johns-Manville Company, Limited.....	14
Canadian Kaolin Silica Products, Limited.....	17
East Malartic Mines, Limited.....	10
Noranda Mines, Limited.....	76
Waite Amulet Mines, Limited.....	36
Total.....	221

DRAUGHTING AND CARTOGRAPHY

The division of draughting and map making is in charge of Marc Boyer. The staff comprises nine draughtsmen.

The Division prepares the base maps for the field parties of the Division of Geological surveys and of the Division of Mineral Deposits, and as soon as possible after the close of the field season it compiles the maps and the plans for the reports of the geologists of these two divisions, and prepares them for engraving and printing.

Moreover the Draughting and Map-making division maintains and keeps up to date two sets of tracings on linen; on one of these sets are plotted all the stakings of claims as they are sent in to the Bureau of Mines by the mining recorders, and on the other set the boundaries of the holdings of each of the mining companies are shown. Each tracing covers the area of one township, on average 10 miles by 10 miles, on the scale of half a mile to the inch. The claim series comprises 305 separate tracings, and the mining companies properties 44 tracings. From these tracings about 3,500 blue-print copies were taken during the year to fill requests for them, received from the interested public. The outlines of 7,324 new claims staked were plotted on the tracings of the first series.

During the year the Division of Cartography prepared the following geological maps, which were reproduced in colours. Of each edition of these maps 3,000 or 4,000 copies were printed:-

Map No. 410 - Mount Alexander Area, Gaspé.
Map No. 463 - Lake Fortune Area, Témiscamingue county.
Map No. 464 - Lake Wasa Area, Témiscamingue county.
Map No. 468 - Eustis Mine, levels 2800, 3200, 3400 feet.
Map No. 477 - Eustis Mine area, Sherbrooke county.
Map No. 491 - Lépine lake area, Abitibi county.
Map No. 494 - Western Part of Vauquelin township, North sheet.
Map No. 495 - Western Part of Vauquelin township, South sheet.
Map No. 496 -"Tétreault mine area" was issued in blue-print form, a few hundred copies having been struck off. On June 30th, 1940, two other coloured geological maps were in press: Map No. 492 "Halliwell mine area" and Map No. 500 Olga Mattagami area, Abitibi Territory.

MINERAL STATISTICS

The Division of Mineral Statistics collects, prepares, and compiles the various statistics relating to the mineral industry of the Province which the Bureau of Mines publishes in its annual reports entitled: "Preliminary Statement on the Mineral Statistics" and "The Mining Industry and its Statistics" as well as in the monthly and quarterly reports.

The data necessary for the compilation of the figures for these statistics are furnished in returns sent in by the operators of mineral deposits; such returns are required to be sent to the Department of Mines by the Quebec mining law. As these data are also required by the Federal Bureau of Statistics, they are sent in duplicate to the Quebec Department of Mines, and one of the copies is forwarded to the Federal Bureau for the compilation of the Mineral Statistics of Canada.

The Quebec Mineral Statistics figures of Quebec for 1939 are based on 1,315 returns of which 1,201 report production or shipments of mineral substances, and 114 report exploration or development work done on mining properties not yet producing. Letters, with blank forms of returns, demanding this information had been mailed to 2,468 companies and individuals, operators or owners of mineral deposits in the Province of Quebec, but 933 answered stating that their property had remained idle all year, and 220 neglected to answer. Of the latter none were of any importance, and we know definitely from the notes of our inspectors of mines and quarries, that most of them did not carry on any mining or quarrying operations, so that the absence of data regarding them cannot appreciably affect the accuracy of the figures of statistics.

The number of returns which we receive every month from the main operators of some of the principal mineral products, to establish our monthly and quarterly bulletins, has varied between 45 and 48 during the year 1939. Mr. C.O. Beaudet is in charge of this division.

DIVISION OF MINERALOGY AND CHEMISTRY

This Division, of which Mr. Archambault is chief, has charge of the Bureau of Mines museum, exhibition displays, lectures to prospectors, the laboratories at Quebec, Montreal and Thetford Mines, and also the Government's sampling plant erected on the Mine-School property.

Museum

During the fiscal year 1939-40, seventeen new specimens were received for the Bureau of Mines museum, among which are samples of gold-bearing quartz from the mine of Malartic Goldfields, Limited, and also from the Provincial Mine-School property.

Exhibitions

Displays by the Bureau of Mines were shown at the following exhibitions:

Eastern Townships Agricultural Association Exhibition held at Sherbrooke, August 26th to September 2nd, 1939.

Quebec Provincial Exhibition, held at Quebec September 1st to 9th, 1939.

At these exhibitions, the displays consisted of ores and minerals from the Province of Quebec, and more than 8,000 copies of booklets on the mines and mineral resources of Quebec were distributed.

Mr. Lafrance was in charge of these exhibits.

Lectures for Prospectors

From January to June 1940, the Bureau of Mines organized series of lectures to prospectors in different centres of the Province. Some 1,600 persons attended these lectures, several for the second and even the third time, indicating a sustained interest in these courses.

Some 2,000 copies of a pamphlet entitled "Notions Elémentaires de Minéralogie" were distributed by the various lecturers. Moreover 369 copies of the "Prospector's Manual" by Goodwin, 539 mineral collections and 204 collections of typical rocks were sold at nominal prices to those persons of the audiences who wished to purchase them.

Laboratories

The main laboratories of the Bureau of Mines are located in Annex E of the Parliament Buildings in Quebec city. In addition to the numerous assays and analyses of samples submitted by prospectors, these laboratories make complete rock analyses of specimens brought in by our geologists. Particular attention is given to the determination of minerals and to the petrographical examination of rocks.

The Bureau of Mines has two other laboratories: in the Ecole Polytechnique Building, 1430 St-Denis, Montreal, and in Thetford Mines respectively. The former laboratory is for the convenience of the public of that section of the Province interested in mines, and the latter is used for the classification of the products of the asbestos industry; to this effect, it is equipped with a standardized testing machine which is used to check the testing machines of the various asbestos mills.

TABLE VIII

Lectures to Prospectors, July 1st, 1939 to July 1st, 1940

County	Town or Village	Number of Lectures	Total Attendances	Lecturer
Abitibi	Amos	33	266	Paul d'Aragon
	Val d'Or	18	283	" "
	Senneterre	15	352	" "
	La Sarre	12	420	Léo Brossard
Argenteuil	Lachute	8	10	Léo Brossard
	Calumet	12	980	Rév. Père Léo G. Morin
Berthier	St-Michel-des-Saints	12	855	Léo Brossard
Champlain	Cap-de-la-Madeleine	11	1,115	Abbé J.W. Laverdière
Charlevoix-Saguenay	Grande Bergeronnes	12	1,520	Léo Brossard
	La Malbaie	12	2,444	Abbé J.W. Laverdière
Chicoutimi	Jonquière	12	1,362	Rév. Père Léo G. Morin
	Port-Alfred	12	1,798	" " " "
Hull	Hull	9	107	Paul d'Aragon
Labelle	Ferme-Neuve	16	132	Paul d'Aragon
Laviolette	La Tuque	12	1,763	Rév. Père Léo G. Morin
Mégantic	Thetford Mines	11	2,238	Abbé J.W. Laverdière
Papineau	Buckingham	17	117	Paul d'Aragon
Quebec	Quebec	12	931	Abbé J.W. Laverdière
Rimouski	Rimouski	12	752	Léo Brossard
Saint-Jacques	Montreal	2	66	Paul d'Aragon
	"	19	468	S.H. Ross
	"	16	388	Paul d'Aragon
Témiscamingue	Rouyn	12	271	Léo Brossard
	Ville-Marie	13	502	Rév. Père Léo.G. Morin
TOTALS:	15 counties, 22 centres	320	19,090	5 lecturers

During the year, the staffs of these three laboratories examined 9,448 samples, on which 14,940 determinations tests or quantitative analyses were effected as follows:

TABLE IX

Laboratory work during Fiscal year 1939-40

Laboratory	Samples Received	QUANTITATIVE ASSAYS AND ANALYSES			Qualitative Tests, Free	Total
		Assay Coupons	Bur. of Mines Analyses	Paid Analyses		
Quebec	7,317	4,689	2,420	947	3,230	11,286
Montreal	1,702	2,020	-----	375	546	2,941
Thetford	429	-----	670	---	43	713
TOTALS	9,448	6,709	3,090	1,322	3,819	14,940

The table shows that 6,709 assays were made free of charge, on presentation of "free" assay coupons which are delivered to holders of mining claims and of development licenses by authority of Sec. 58a of the Quebec Mining Act.

The decrease in the number of analyses effected is mostly due to the fact that prospecting activities have fallen off since the beginning of the war.

During the year, the Quebec laboratories also made 46 optical studies of minerals and rocks, of which 12 were petrographical, a complete rock analysis, as well as an exhaustive examination and complete analyses of several samples of alleged natural petroleum products.

Provincial Government Sampling Plant

The construction of a bulk sampling plant on the ground of the Mine School, near Val d'Or, Abitibi county, was started in May 1939, and was completed at the end of January 1940; the slow delivery of the machinery delayed the starting into operation.

The plant consists essentially of crushers, conveyors and samplers which automatically cut out a sample weighing 0.2 per cent of the original bulk sample, crushed to a fineness of about 100 mesh. The capacity of the plant is at least three tons per hour, and with its modern equipment any ore can be sampled accurately, particularly coarse gold ores and "spotty" ores.

In addition to the sampling plant proper, there is an amalgamation annex, where all rejects from the samplers pass when the ore is a gold ore. The amalgamation unit is mainly for the purpose of checking the accuracy of the sampling, and a high recovery of the gold content is not to be expected. However, in the case of high-grade or coarse-gold ores, the shipper of bulk samples may frequently derive some revenue from the operation.

After starting the plant, certain changes were decided upon, and the mill staff in the following months was mainly working on these alterations and in tuning the mill, using ore from the mine of the School for this purpose. During the trial period, 86.9 tons of this ore was sampled, and 4.58 ounces of gold was recovered.

It is expected that by October 1940, the plant will be ready to receive bulk samples for the sampling and treatment of ores, either from mines in the development stage before the erection of a mill has been decided upon, or from the working of small deposits of rich ores, without sufficient tonnage to justify the expense of an individual mill. Charges for such "custom" work shall be strictly at cost.

This availability of a Government sampling and amalgamation plant, in the very centre of a widely mineralized region which has been shown, by the presence of numerous successful operating mines, to possess great potentialities, should prove a great benefit to the innumerable mining initiatives which are now at work in a district favoured with means of easy communication and cheap transportation. G.S. Grant is the manager of the plant.

LEGISLATION

Important measures of legislation, which concern the mining industry, were passed at the session of the Quebec legislature which closed by prorogation on June 22nd 1940.

The Act 1 George VI, chapter 28, passed in 1937, whereby it was enacted that "no corporation unless solely constituted under a law of the Province may acquire any right in any hydraulic power, waterfall, rapid, land, forest or mine forming part of the public domain of the Province.....", was repealed. In consequence, in order to acquire or hold mining property in Quebec, it is no longer necessary that a company take out a provincial charter.

A law was passed, entitled "The Unwrought Metal Sales Act", in order to facilitate the suppressing of the illegal traffic in precious metals, which proceeds mainly from "high grading" in mines, by requiring anyone carrying on the commerce of precious metals in unwrought form, to have a license to that effect.

The Quebec Mining Act was further amended as follows:-

Section 42 of the Act (Revised Statutes 1925, Chapter 80), as amended by the acts 19 Geo.V, c. 26, s. 3, and 3 Geo.VI, c. 51, s. 4, is again amended by inserting therein, in the second to the last paragraph thereof, which was added by the last of said acts, after the word: "revoked" in the sixth line of the said paragraph, the words: "as to the mining rights". This measure applies only to mining concessions patented before July 1st 1911 and to concessions of land, containing ore, made before July 24th, 1880.

The following section (42a) was added after section 42:

42a - When the Minister proposes to effect a revocation of concessions of mining rights in virtue of the preceding section, he shall cause a sixty days' notice to be served upon the owner. If the owner does not reside in the Province or cannot be traced, the notice shall be given by publishing it in the Quebec Official Gazette, and also in a French and an English daily newspaper, in the city of Montreal.

PUBLICATION OF REPORTS AND LIBRARY

During the year, this Division has edited and supervised the printing of the following reports:

Mining Industry and Statistics of the Province of Quebec for the Year 1938.

Geological Report No. 1 - Launay township, Abitibi county, by S.H. Ross.

Geological Report No. 2 - Lower Laflamme River Area, Abitibi District. Western Section, by P.E. Auger; Eastern Section, by W.W. Longley.

Geological Report No. 3 - Risborough-Marlow Area, Frontenac county, by Carl Faessler.

Geological Report No. 4 - Lépine Lake Area, Destor township, Abitibi county, by H.M. Bannerman.

Geological Report No. 5 - Fortune Lake and Wasa Lake Map-Areas, Dasserat and Beauchastel townships, by G.S. MacKenzie.

Regulations for the Safety and Protection of Workmen in Mines and Quarries, established by order-in council in virtue of the Quebec Mining Act.

P.R. 148:

Preliminary Statement on the Mineral Production of the Province of Quebec in the Calendar Year 1939.

The above reports were printed in book form and are published in volumes. The French version comprised a total of 406 pages and the English version 362 pages.

The following preliminary or special reports were issued by photo-litho or mimeograph processes:

P.R. 136-Tétreault Mine, Montauban-les-Mines, Portneuf county, by John J. O'Neill and F. Fitz Osborne (special report with maps).

P.R. 137 - General Report of the Minister of Mines and of the Minister of Game and Fisheries of the Province of Quebec for the Year ending June 30th, 1939.

P.R.-138 - The Malbaie Area, Gaspé, Que. by H.W. McGerrigle.

P.R. 139 - Brucite by F.Fitz Osborne. With map.

P.R. 140 - Southern Part of Calumet Island and the Adjacent Mainland, by F.Fitz Osborne.

P.R. 141 - Nominingue-Mont-Laurier, Labelle county, by E. Aubert de la Rüe.

P.R. 142 - Buteux Area, Abitibi county and Abitibi territory, by B.C. Freeman. (with map).

P.R. 143 - Barry Lake Area, Abitibi county and Abitibi territory, by R.L. Milner. (with map).

P.R. 144 - North Shore of the Saint-Lawrence from des Rapides river to Matamec river, Saguenay county, by Carl Faessler.

P.R. 145 - Flavrian Lake Map-Area, Beauchastel and Duprat townships, Témiscamingue and Abitibi counties, by W.G. Robinson.

P.R. 146 - Kitchigama Lake area, Abitibi territory, by W.W. Longley.

P.R. 147 - Montreal Area, by T.H. Clark.

P.R. 149 - Siscoe Area, by P.E. Auger.

P.R. 150 - Mining Properties and Development in Abitibi and Témiscamingue counties during 1939, par S.H. Ross and others.

The above preliminary reports comprised 239 pages in the French version and 220 pages in the English version.

All these reports were issued both in French and in English.

Albert Côté has charge of the Division and he has as collaborators: R.P.D. Graham who edits the English version of the reports; Raymond Lesage, translator; A.K. Ware in charge of publicity and advertising; and André Champagne, proof-reader.

Distribution of Publications

J.-A. Brochu, who has charge of the distribution of the publications of the Bureau of Mines, reports that during the fiscal year 19,744 copies of reports on the mining industry and the geology of various regions of the Province were distributed to the public. Of these publications 9,580 were in the French language and 10,164 were in English. These figures do not comprise the geological maps distributed separately, nor the statistical bulletins on the mineral production which are issued monthly and quarterly.

Library

During the fiscal year 1939-40, the library of the Bureau of Mines acquired, by purchase or by exchange, 477 new volumes and pamphlets, which bring to 6,376 the number of books it contains.

These books comprise works on geology, mineralogy, mining industry, mineral chemistry and other allied subjects. They also consist of government reports of Canada and United States as well as various statements and monographs of scientific and technical societies.

Moreover, the library subscribes to 46 technical periodicals and 12 mining papers.

Although the library is maintained chiefly as a source of information for the members of the Bureau, the interested public is welcome to make use of all these facilities.

The cataloguing of the books is progressing; the catalogue is already sufficiently to prove its usefulness and to facilitate the finding of information necessary to the technical staff for its work.

A meeting of the chiefs of divisions is held once a month to recommend the purchase of some new volumes and make any suggestions for the useful maintenance and classification of the documents.

MINE-SCHOOL

The Mine-School was established by the Provincial Government in 1938 for the purpose of training young men with a primary school education, as efficient miners to enable them to earn a good living in the Western Quebec mines. This undertaking was started as part of the Provincial-Federal programme for Youth Training. The School is located near Val d'Or, in Abitibi.

The property, a fully developed mine, is owned by the Quebec Bureau of Mines, which acquired it at sheriff sale, and maintains it in good order, provides the necessary equipment, machinery, and living quarters for the apprentices and the teaching staff.

The Youth Training Plan Branch of the Quebec Department of Commerce, Industry and Municipal Affairs, in cooperation with the Bureau of Mines, has the direction and administration of the School. It selects the candidates for apprenticeship and provides the instructors, necessary training outfit and commissariat.

G.S. Grant, Manager of the Mine-School, reports as follows on its activities during the fiscal year 1939-40:

Construction work done during the year consisted chiefly of the completion of three residences for members of the staff.

The dynamite magazine was moved to a safer location, farther away from the mine buildings, and a building, formerly used as a storehouse by the Gale Gold Mines, was moved up to the mine buildings, and will be used as a carpenter shop.

The capacity of the heating plant was increased by the installation of an 80 H.P. boiler.

In order to obtain a cleaner supply of water for domestic purposes, the river pump suction line was extended 150 feet from the pump into deeper water.

Three new 200 K.V.A. single phase transformers were bought and installed to take care of the additional power requirements.

Underground development work, in the mine, was as follows:-

Drifting	1557.8 feet	Station cutting	97.2 feet
Cross cutting	2738.4 "	Stoping	2671.0 tons
Slashing	73.8 "	Waste hoisted	23989.0 "
Raising	15.0 "	Ore hoisted	87.0 "
Shaft sinking	208.0 "	Diamond Drilling	1664.0 "

Main features of the development work were the begining of drifting on the main vein on the new 375-and 500-foot levels, and the driving of a crosscut to a vein discovered in diamont drilling, which carried interesting values. This work has not yet reached the stage where its importance can be judged.

Material drawn from the stopes is being sorted, and the sorted ore stored in the mine. Eighty-seven tons of this material was sent to the Government Sampling Plant, on the property, for mill test purposes. From this ore, approximately 4.6 ounces of gold has been recovered by amalgamation.

Since the opening of the School, 300 apprentices have been admitted for training. Of this number, 155 have secured employment in various mines of the Province, 106 have left the School for various causes, and 39 were in training on July 1st, 1940.

SCHOLARSHIPS

For the fourth consecutive year scholarships have been granted to students of merit who are specializing in the mining engineering courses of universities. In 1939-40 the committee of awards consisted on the following members:- A.O. Dufresne, director of the Bureau of Mines, chairman of committee; Adrien Pouliot, dean of Science Faculty of Laval University; W.G. McBride, professor of Mining Engineering, McGill University; Abbé J.W. Laverdière, D.Sc., secretary Science Faculty, Laval University; Théo.C. Denis, technologist of the Bureau of Mines; Armand Circé, director of Ecole Polytechnique; Charles Bilodeau, secretary committee.

Forty-five students were awarded scholarships; they elected to study in the following universities and institutions:

Post graduates:	Colorado School of Mines	1
	Carnegie Institute	1
	McGill University	1
	Queen's University	1
Undergraduates:	McGill University	5
	Queen's University	9
	Ecole Supérieure des Mines (Laval)	22
	Ecole Polytechnique	5

Of the post-graduate students one obtained the degree of Doctor of Philosophy (Ph.D.) in geophysics, from the Colorado School of Mines; one obtained the degree of Master of Science (M.Sc.) in geology, from Queen's University; one obtained the degree of Master of Science (M.Sc.) in mining engineering from McGill University; and the fourth, the degree of Bachelor of Science (B.Sc.) in metallurgical engineering from Carnegie Institute of Technology.

Seven of the undergraduates of the final year of studies obtained their diplomas of mining engineers.

As to the balance of scholarships, they were awarded to students in years below the final one.

MINE VILLAGES (1)

The great mining activity, which was well sustained in the Province of Quebec during the last fiscal year, was an important factor in the organization and the improvement of the centres of population of the mining regions.

The new section of the town of Bourlamaque, which was opened during the preceding year is in part occupied by good buildings of pleasing appearance.

The town of Malartic which last year was incorporated as a municipality, by Act 3, Geo.VI, chap. 124, continued to grow and to progress normally. This municipality may be cited as a model of its kind.

The mining town of Cadillac developed as it had been foreseen. During the fall of 1939 the Bureau of Mines constructed a septic tank for sewage purification, a main sewer, and an extension to the water-works system. During the winter, in order to improve the quality of the water, a series of bored wells were sunk in search of an underground source of potable water for domestic use. This was quite successful. The necessary works to utilize this new source of supply are now under way. The new Rouyn-Val d'Or highway is now completed; it goes through the village and this is a contributing factor to the progress of the community

In the village of Pascalis, the subdivision into cadastral lots of the new section, which was started last year, has been completed, and numerous building lots have been sold. In the spring of 1940 borings were put down in search of an underground supply of potable water. This work has given good results; however, the study of the question is not yet completed.

By virtue of an act of the Legislature, Act 4,Geo.VI, chap. 94, Rouyn-Sud has been incorporated into the municipality of the town of Rouyn. The various municipal services of Rouyn are now extended to benefit what was the mining village of Rouyn-Sud. In the south-eastern part of Rouyn-Sud the Roads Department changed the location of the Rouyn-Val d'Or highway.

In Guillet township the mining activities are such as to require the organization of a mining village in a near future. Owing to the increasing population in the vicinity of the Arntfield mine, the operating company, the Arntfield Gold Mines, Limited has submitted a further building lots subdivision, for cadastral registration. The plan has been approved on the same conditions as those stipulated for the cadastral subdivisions of the town of Malartic, which were presented by Canadian Malartic Gold Mines, Limited.

(1) Report of Burroughs Pelletier, C.E., chief of Division of Mine Villages.

MINE ROADS

During the fiscal year 1939-40 a length of 37.16 miles was added to the network of mine roads of the Province of Quebec. The total length of these roads is now 947.96 miles. Léon A. St-Pierre, C.E., has charge of this division.

In addition to the construction of the new mine roads the Department of Mines completed the construction of 143.33 miles of roads which had been opened in previous years; maintenance work was also done on 45 miles of other mine roads.

The total expenditure, new construction and improvements, of these roads in the fiscal year was $503,305.99, which brings to $4,936,562.32 the total cost, to date, of the mine roads of the Province.

Moreover, in the addition to the above sum of $503,305.99 the Department of Mines paid out $1,900 for the maintenance of certain roads, and a total amount of $7,000 to facilitate the means of communication in the mining region during the winter of 1939-40.

The appropriations to meet the expenditure of $505,305.99 during the fiscal year 1939-40 for construction and improvement, were as follows: (a) Provincial government appropriation $163,034.29; (b) Federal-provincial Agreement appropriation $340,271.70. This latter amount is made up of three items: Federal government contribution $221,362.00; Provincial government contribution $110,708.01; Mining companies' contributions $8,201.69.

The Provincial government appropriation was applied to construction, completion and improvements, on the following roads:-

Oremonte mine road, in Dalquier township, Abitibi county,

Lac Malfait road, leading to a marl deposit, parish of St. Léandre, Matane county;

Barraute (towards Val d'Or) road, drainage of a section of the road, Abitibi county;

Cadillac village, Abitibi, roads leading out of the village;

Road connecting an oil derrick site, with the York river road, in Gaspé South county;

Antimony deposit road, to reach an antimony deposit in New Richmond township, Bonaventure county:

Road to reach marl deposit, from Gaspé cross-road, parish of Ste-Anne-des-Monts:

Road from Grenat-Canada road, to Labelle village, Labelle county;

Road leading to "Quebec Asbestos" property, in parish of Ste-Lucie, Montmagny county;

Road to Bay-St-Paul Titanic Iron mine, parishes of Bay St-Paul, and St-Urbain, Charlevoix county;

Grand Cascapedia River road, in counties of Bonaventure, Matapédia and Gaspé-Nord;

Stadacona mine road, in Rouyn township, Témiscamingue township;

Senator-Rouyn mine road, in Rouyn township, Témiscamingue township;

Normetal mine road, Desmeloize township, Abitibi county;

Latulippe to Lac Guillet road, Témiscamingue county.

By virtue of the Federal-Provincial agreement, and from the appropriations specially noted for the "improvement of the means of transportation in mining districts", certain roads were completed, while others were opened and constructed. The following roads were completed during the fiscal year 1939-40:-

A 10-mile section, of the mine roads in the township of Tiblemont, in Abitibi in the county of Abitibi.

Cassels-Duval Mine road, linking it to the Rouyn-Louvicourt highway, in Abitibi county.

York River road, in the counties of Gaspé-North and Gaspé-South.

Senneterre-Lac Madeleine road, a section 38½ miles long, from a point about 35 miles north of Senneterre, to the Flordin mine branch road, Abitibi county and territory.

Grand Cascapedia River road.

The following roads were opened and built during the year by virtue of the Federal-Provincial agreement:-

Val d'Or-Barraute road, a section of 6.68 miles, starting from the town of Val d'Or.

Waite-Amulet road, road to connect the Amulet mine with the Waite mine.

Flordin mine road, road connecting the Flordin mine in Desjardins township, with the Senneterre-Madeleine lake road.

From the above lists it will be noted that the Department of Mines particularly aimed, during the year 1939-40, to complete and improve the roads already opened, without neglecting however, the opening of new roads needed for the development of the mining industry of the Province.

Your obedient servant,

A.O. Dufresne,

Director.