

# GENERAL REPORT

OF THE

MINISTER OF MINES

OF THE

PROVINCE OF QUEBEC

FOR THE YEAR ENDING MARCH 31st

1950

---



Quebec, October, 1950.

To the Honourable  
Gaspard Fauteux, P.C., LL.D., D.D.S., L.D.S.,  
Lieutenant-Governor of the Province of Quebec.

Sir,

I have the honour to submit to you a  
summary report of the work carried out by the Department  
of Mines during the fiscal year ending March 31st, 1950.

Your respectful servant,

C.D. FRENCH,  
Minister of Mines.

TABLE OF CONTENTS

	<u>Page</u>
The mining industry of Quebec in 1949-1950 .....	5
Table I.-Average prices of metals in 1948 and 1949 .....	6
Table II.-Mineral production of the Province of Quebec, 1948 and 1949 .....	7
Table III.-Subdivision of Annual Value of the Mineral Production of Quebec, 1945-49 .....	8
Legislation .....	13
Mineral Rights branch .....	14
Table IV.-Various Titles issued by the Department of Mines (Fiscal Years 1948-49 and 1949-50) .....	14
Table V.-Titles issued since 1947-48 (Fiscal Years) .....	15
Table VI.-Comparative statement of exploration work on mining claims and licenses during calendar years 1947 to 1949 .....	15
Inspection of Mines branch .....	16
Geological Surveys branch .....	18
Equipment section .....	22
Mineral Deposits branch .....	22
Division of Technical Information and Distribution of Publications .....	25
Laboratories branch .....	26
I -Research laboratories .....	26
II-Laboratories for chemical analyses and assays .....	26
Table VII.-Summary of Analytical Work Done in Laboratories .	29
Mineralogy and petrography laboratory .....	29
Spectrography, radiocrystallography and radioactivity laboratory .....	30
Chemical laboratory .....	30
Laboratory of Metallurgy .....	30
III-Sampling and Ore Dressing Plant .....	31
Table VIII.-Samples of Ores Received at the Plant for Bulk Sampling .....	31
Table IX.-Shipments of Ore Received for Treatment and Extraction of Gold and Silver .....	31
IV-University courses on mineral prospecting .....	32
V-Museum and displays at exhibitions .....	32
Draughting and Cartography branch .....	33
Civil Engineering branch .....	35
Division of mine roads .....	35
Peat bog drainage .....	41
Division of mining villages .....	42
Division of Mineral Statistics .....	44
New Mining Companies .....	46
Division of Edition and Printing .....	48
Publicity and Information .....	50
Collection of Dues on Mines .....	54
Table X.-Comparative Statement of Revenue Collected by the Department of Mines (Fiscal Years 1947-48; 1948-49; 1949-50 .....	56
The library .....	57
Scholarships of the Department of Mines .....	57

REPORT OF THE DEPARTMENT OF MINES

OF THE PROVINCE OF QUEBEC

For the Fiscal Year Ending March 31st, 1950

---

To the Honourable D.C. French,  
Minister of Mines,  
Quebec, Que.

Sir,

In compliance with the Quebec Mining Act, which states in Section 229, chapter 196, Revised Statutes of Quebec 1941, that "the Minister of Mines shall submit, with his annual return to the Legislature a statement respecting the mines of the Province", I have the honour to present a summary report on the work carried out by the staff of the Department of Mines, during the fiscal year of April 1st, 1949, to March 31st, 1950.

Your obedient servant,

A.O. Dufresne,  
Deputy Minister

---

THE MINING INDUSTRY OF THE PROVINCE OF QUEBEC

DURING THE FISCAL YEAR 1949-50

During the calendar year 1949, the value of the mineral production of the Province of Quebec attained the highest amount of its history, that is \$165,168,603, an increase of 8 1/2 per cent on the total of the preceding year, which was \$152,285,045. This is the third consecutive year that a new record was established.

The higher production in metals alone is responsible for this increase. Of all the metals, gold is again in first place with an increase of 25 per cent in the value received.

The progress made in the production of metals of the Province of Quebec during the past twenty years is a source of great satisfaction. In 1930, it was less than 14 million dollars, of which gold accounted for three million or 22 per cent; in 1949, metals brought in nearly 83 million dollars, of which gold contributed almost 35 million or 42 per cent. The other metals in order of importance of their production value are copper, zinc, silver, lead, selenium, chromium, and titaniferous iron.

The industrial minerals have registered a falling off of about 7 per cent compared with the values received in 1948. The chief cause of this decrease was the suspension of operations in the asbestos mines owing to the strike which lasted from February 14th to July 5th, 1949. This strike gravely affected the production of asbestos fibre, causing the value to fall from \$42,231,475 in 1948 to \$39,746,072. Asbestos is the most important mineral substance extracted from the underground of the Province of Quebec, and it represents more than 60 per cent of the world's production.

In the category of mineral substances used as construction material, a slight decline has also been recorded. The group of construction material accounts for a little more than 21 per cent of the total value of our mineral production. The greater part of this value was applied to residential construction in an effort to remedy the scarcity of homes in urban centres, where the lack of dwellings is still very acute.

In the month of September, 1949, the Canadian Government reduced the value of the Canadian dollar 10 per cent in relation to the American dollar. This decision was to effect an increase in the price of metals exported to the United States, and principally that of refined gold in Canadian funds to \$38.50 an ounce troy.

Table I.-Average Prices of Metals in 1948 and 1949

	1948	1949
Gold, per ounce troy fine .....	\$35.00	\$36.00
Silver, per ounce troy fine .....	0.75	0.7425
Copper, per lb. ....	0.2235	0.19973
Lead, per lb. ....	0.1804	0.158
Zinc, per lb. ....	0.1393	0.13247

Table II.-Value of the Mineral Production of the Province of Quebec in Calendar Years 1948 and 1949  
(Compiled by C.O. Beaudet, Chief, Division of Mineral Statistics of the Quebec Department of Mines)

	Value 1949	Value 1948
<b>METALS</b>		
Bismuth .....	\$ ---	\$ 26,406
Chromite .....	7,148	33,568
Copper .....	27,092,363	21,819,473
Gold .....	(a)34,674,688	(a)26,987,485
Lead .....	1,832,510	1,717,741
Manganese .....	---	88
Molybdenite .....	---	137,143
Selenium .....	204,403	238,974
Silver .....	2,412,773	1,782,790
Titaniferous iron ore .....	2,892	21,091
Zinc .....	16,601,312	13,339,095
Sub-totals .....	\$ 82,728,089	\$ 66,103,854
<b>NON-METALLICS</b>		
I.- Industrial Minerals		
Arsenic (White) .....	\$ 17,535	\$ 27,246
Asbestos .....	39,746,072	42,231,475
Feldspar .....	388,934	464,926
Industrial lime .....	2,532,742	3,065,052
Industrial limestone .....	1,187,601	1,135,904
Magnetitic dolomite, brucite and magnesium .....	1,536,200	1,724,489
Marl .....	28,005	13,494
Mica .....	71,217	173,744
Mineral waters .....	145,831	109,789
Ochre and iron oxide .....	184,586	193,619
Peat moss .....	445,636	434,125
Phosphate .....	291	---
Pyrite .....	348,806	263,330
Quartz and industrial sand .....	380,477	767,118
Soapstone and talc .....	160,036	145,361
Sub-totals .....	\$ 47,173,969	\$ 50,749,672
II.- Building Materials		
Building lime .....	\$ 618,894	\$ 623,269
Building limestone .....	4,433,412	4,688,855
Cement .....	13,722,635	12,306,243
Clay products- Brick .....	4,182,762	3,740,165
Other products .....	1,396,364	1,382,606
Granite .....	2,578,169	2,218,520
Marble .....	182,147	145,957
Sand and gravel .....	7,326,456	9,535,944
Sand-lime brick .....	303,250	249,656
Sandstone .....	520,607	538,304
Slate and shale .....	1,849	2,000
Sub-totals .....	\$ 35,266,545	\$ 35,431,519
Grand Totals .....	\$165,168,603	\$152,285,045

(a) Value in Canadian funds. The standard value at the rate of \$20.671834 per ounce troy is \$19,853,395 for 1949 and \$15,939,452 for 1948.

Table III.-Subdivision of the Annual Value of the Mineral  
Production of the Province of Quebec, 1945-1949

Year	Metals	Per Cent	Industrial Minerals	Per Cent	Building Materials	Per Cent	Total
1945	\$48,082,817	52	\$29,045,465	32	\$14,442,702	16	\$ 91,570,982
1946	40,602,170	44	31,573,378	34	20,038,108	22	92,213,656
1947	50,159,626	43	39,792,717	34	26,089,657	23	116,042,000
1948	66,103,854	44	50,749,672	33	35,431,519	23	152,285,045
1949	82,728,089	51	47,173,969	28	35,266,545	21	165,168,603

During the first three months of 1950, there is a substantial increase in the production figures of all and each of the metals, as compared with those of the corresponding period in 1949. thus presaging a new record for 1950.

In the category of non-metallic minerals, termed "industrial minerals" in order to distinguish them from combustible minerals, the production of asbestos during the first three months of 1950 has been more than double that for the same period in 1949. Asbestos fibre is by far the principal mineral product of this category, and the demand is maintained at a high level owing to the active reconstruction of the post-war period.

Chief among the new activities of the year from a point of view of mineral development of the Province, we might mention the progress brought about on the several mining properties that follow.

Quebec Iron and Titanium Corporation, a company which is conjointly the property of Kennecott Copper Corporation and of New Jersey Zinc Company, worked sedulously all year toward the exploration and development of the large deposits of ilmenite in Parker township, in the region of Allard lake, situated on the north shore of the Gulf of St. Lawrence, opposite the west part of Anticosti island.

The chief installation work done during the fiscal year 1949-50 was the construction of a railroad, a section of 15 miles of railway of standard gauge having been completed. The total length of the railroad, from Havre Saint-Pierre to the main deposit, in the neighbourhood of Tio lake, is 27 miles and includes a tunnel 700 feet long. Work on the mineral deposit has been confined to scraping and trenching, and exploration outlining the volume of the orebodies has been very satisfactory. Engineering projects were directed toward the construction of wharfs, loading platforms, and installation of

mechanical apparatus for the conveyance of the ore at Havre Saint-Pierre.

The objective of the Quebec Iron and Titanium Corporation, which foresees a production of 1,500 tons of ilmenite a day on its mineral concession of Allard lake, will be realized in the near future. The ore will be transported by boat to Sorel, a city situated at the confluence of the Richelieu and the St. Lawrence rivers, an approximate distance of 500 miles. The construction of wharfs and of unloading docks at this place, as well as that of mills and metallurgical plants, is well advanced. It is estimated that the plant at Sorel will have a production rate of about 500 tons of iron and 700 tons of titanium-rich slag a day.

Hollinger North Shore Exploration Company Limited, holds, since 1942, a special exploration license on an area of 3,900 square miles in the territory of New Quebec (Ungava). This special license was renewed by an Act of the Legislature in 1946.

The progress of the work accomplished has been recorded each year in the Annual Reports of the Department of Mines of the Province of Quebec.

At the end of the year 1948, the company reported it had carried out exploration by diamond drilling and boring chisels, operations which have indicated the presence of at least fifteen iron deposits or orebodies having a total volume of 222,774,000 tons, mineable by open-pit methods. During the year 1949, an additional volume of 19,207,000 tons was outlined, which raised the number of distinct deposits to twenty, for a total volume of 242,281,000 tons (2,240 pounds) of high-grade iron ore, subdivided as follows:-

	Tons	Fe%	Mn%	P%	SiO <sub>2</sub> %
Bessemer ore	141,735,000	60.53	0.35	0.028	8.21
Non-Bessemer	67,722,000	57.15	0.58	0.107	8.26
Manganiferous	32,824,000	50.11	7.98	0.091	7.68

In 1949 this company had thirteen geological parties and six prospecting crews in the field in New Quebec and Newfoundland Labrador. The geological surveys have been reported in plans at the scale of one inch to 1,000 feet along the principal mineralized zone of the area from the Burnt Creek orebody to the Eclipse orebody, a distance of about fifty miles.



Preliminary surveys in order to plot the line of the proposed railway between Seven Islands, on the St. Lawrence, and Knob lake in New Quebec have been completed, and the final direction has been fixed for two-thirds of the length of the route, which will be 360 miles. It is expected that the work of determining the route will be completed during the field season of 1950.

In 1947, the Ungava Power Company Limited was organized by a provincial charter. In 1949, the company presented to the Quebec Government a request for permission to harness the Eaton Canyon rapids, of the Kaniapiskau river, about 22 miles northwest of the ore deposit Eclipse, which is the farthest north of the exploration ground of the Hollinger North Shore Exploration Company, Limited. The potentiality of these hydraulic forces, at the season of low water, is estimated at 140,000 H.P. and, with the erection of a reservoir, 400,000 H.P. could be obtained.

Concerning the project of the iron mines of New Quebec, the formation of the Iron Ore Company of Canada was also made known at the close of 1949. This company will supply the necessary funds for the construction of the railway, the installation of hydraulic power, wharfs, and other development essential to the mining of the deposits. Two important facts relative to this new organization are that five American steel companies, namely, Armco Steel, National Steel, Republic Steel, Wheeling Steel, Youngstown Steel and Tube, as well as M.A. Hanna Ore and Coal Corporation, have agreed to buy the iron ore in quantities sufficient to justify an annual production of 10 million tons. Moreover, only a part of the two concessions, that of New Quebec and that of Labrador, and only a part of the ore reserves now known are involved in the concluded arrangements.

Quemont Mining Corporation, Limited, is mining complex orebodies containing copper, gold, silver, zinc and pyrite in Rouyn township, on a concession adjoining that of Noranda Mines, Ltd.

The Quemont mine started production and shipments of ore in mid June, 1949, after a long period of exploration, which commenced in 1920, when the Murray brothers of Haileybury staked out some mining claims to the north of the Edmond Horne discovery, which later became the Noranda mine. During 1926, United Verde Extension Company of Arizona carried out about 6,000 feet of diamond drilling. Development of the property and construction of installations with a view to mining were undertaken in 1928 by "The Mining Corporation of Canada", which later became "Quemont Mining Corporation". These operations were suspended during 1930.

In 1943, interesting discoveries made on the Donalda property, to the east of the Quemont mine, started a new period of activity in this area, and, in the following year, it was decided to undertake a geophysical survey of the property.

A drill hole put down in 1945 in Osisko lake cut a 150-foot section of rock mineralized with copper and gold. In the spring of the same year, the No.1 shaft was repaired, having been put down nineteen years before, near the boundary of the Noranda property. In March, 1946, the presence of 6,000,000 tons of ore containing gold, silver, copper, and zinc was assured. It was then decided to open up the No.2 shaft, north of the Horne Creek fault. This shaft, having five compartments reached a depth of 2,600 feet and served sixteen horizons starting from the 200-foot level. It is now the principal mining shaft. At the close of 1949, additional horizons were opened up.

The Quemont concentration plant can treat 2,000 tons a day, and produces each month an average of 1,200 tons of zinc concentrate at 51.5 per cent, which is shipped to New Jersey Zinc Corporation in the United States, 4,700 tons of copper concentrate at 20 per cent, containing more than 1.9 oz. of gold and 7.0 oz. of silver per ton, shipped to the Noranda smelter, and 9,300 tons of pyrite concentrate containing 48 per cent of sulphur, 10,000 oz. of gold and 35,000 oz. of silver.

Ore reserves at the end of 1949 were stated to be 9,220,500 tons of an average tenor of 0.17 oz. of gold per ton, 0.95 oz. of silver per ton, 1.5 per cent copper, and 2.78 per cent zinc.

Anacon Lead Mines, Limited, was organized by an Ontario government charter, under date of May 4th, 1948, for the purpose of acquiring and operating the former Tétreault mine at Montauban-les-Mines, in Montauban township, Portneuf county.

The mine and ore-dressing mill were rehabilitated and the mill started production in the month of December, 1948, to treat the ore broken by previous operators. During 1949, there was milled 149,818 tons of ore having an average tenor of 5.44 per cent zinc, 0.90 per cent lead, 2.0 oz. silver per ton, and 0.01 oz. gold per ton. An average of 410 tons of ore was milled per day, and improvements to the plant permitted milling up to 600 tons per day at the beginning of 1950. The ore reserves, which were estimated at approximately 300,000 tons when the Anacon company was formed, are now 442,853 tons of ore of all categories, having an average tenor of 4.371 per cent zinc, 1.296 per cent lead, 0.011 oz. gold, and 2.00 oz. silver per ton.

The encouraging results obtained by Anacon Lead Mines, Limited, have stimulated the exploration of new deposits in the Montauban-les-Mines area. Moreover, the work undertaken by Ascot Metals Corporation on its property of Moulton Hill, three miles northeast of Sherbrooke, has led to renewed interest in one of the oldest mining areas of the Province. Installation work with a view to starting operations is well advanced, and a concentration mill with a capacity of 400 tons per day, operating during 1950, is foreseen.

Discoveries of uranium minerals in the counties of Portneuf and Charlevoix have been the cause of some staking of claims in these areas.

Later in the season, reports of interesting mineral discoveries in Queylus and Barlow townships, near Gwillim lake, in the Chibougamau area, together with the near completion of the new highway from St-Félicien, Lake St. John, have given rise to a lively interest in prospecting. Intense activity is expected in this area during the summer of 1950.

Recent discoveries made by Gaspé Copper Mines Limited, a subsidiary of Noranda Mines Ltd., in Holland township, Gaspé-North county, are responsible for the great advance in the exploration of the mineral deposits of Gaspesia. From reports supplied by the company, explorations carried out to date disclose the presence of fifty million tons of ore containing an average of a little more than one per cent copper. A remarkable feature of these latest developments is the fact that the ore recently outlined has an average tenor of two per cent copper, whereas the ore previously found indicated a tenor barely attaining one per cent of the metal. At the beginning of 1950, drilling operations were continuing in the area of Mont Needle, where a deposit 2,500 feet long by 800 feet wide and ranging in depth from 80 to 120 feet is reported. The tenor of copper of this particular deposit is two per cent, and the tonnage is about 15 million tons, according to estimates made at that date.

The success achieved by this company has attracted several other mining organizations in the area.

East Sullivan Mines, Limited, is another mining company which has registered noteworthy success during the year. Being in continued production only since the beginning of 1949, this mine, situated in Bourlamaque township, has produced, during the course of the year, more than 28 million pounds of copper, 10,500,000 pounds of zinc, 12,447 oz. of gold, and 290,767 oz. of silver. Moreover, the installation of a mill for the pyrite has been completed, and arrangements for the sale of this product have been concluded.

According to reports issued by the company, the ore reserves are of the order of 4 1/2 million tons of an average tenor of 1.95 per cent copper, 1.11 per cent zinc, 0.020 oz. gold, and 0.45 oz. silver to the ton.

The concentration plant started operations at the beginning of the year 1949, and its capacity has been gradually increased to 2,500 tons a day.

#### LEGISLATION

During the session of the Quebec Legislature which was held from February 15th to April 5th 1950, several measures concerning the Quebec Mining Act were passed.

Section 41 of the Act (Revised Statutes 1941, ch. 196) was amended changing the price of mining concessions to fifteen dollars an acre for superior metals and nine dollars for inferior metals.

Section 64 of the Quebec Mining Act (Rev. Stat. 1941, chap. 1941) was amended to read as follows:

"64. Any holder of a miner's certificate may stake out claims as mandatory of other holders of like certificates, up to a total of four hundred acres per year and, in the case of lands situated north of the fiftieth degree of north latitude, up to a total of eight hundred acres per year.

"The notice of the establishing of such claims to the Bureau of Mines or to the mining recorder of the district, shall be signed by the person who himself did the staking, and shall contain, in addition to the details required by section 67, the numbers and dates of the mandator's and of the mandatory's miners' certificates.

"These provisions shall apply to the staking out of claims under section 85, but in such case, the total area staked out as mandatory shall not exceed two thousand five hundred and sixty acres per year."

"The staking out and recording of claims up to a total of eight hundred acres, carried out before the fifteenth of December, 1949, by holders of miners' certificates, as mandataries of other holders of like certificates, shall not be invalid by reason of the fact that such claims are situated at less than one hundred miles from a railway or a highway."

Moreover an order-in-council (No.411) was passed on April 12th, 1950, to establish the manner of appraising statutory mining assessment work done by mechanical apparatus driven by motive power, as man-days of labour.

MINERAL RIGHTS BRANCH

During the fiscal year ending March 31st, 1950, the number of miner's certificates issued numbered 4,608, a slight increase of 4 per cent as compared with the preceding year's 4,425. The number of such certificates to a certain extent reflects the prospecting activities, for they are permits to stake out mining claims. It is a normal increase. A miner's certificate, which is good only for the current year in which it is purchased, entitles the holder of it to stake out five standard claims of 40 acres each, or in all 200 acres, in unsurveyed territory. In surveyed territory divided into lots he may proceed in the same manner (sections 60 and 61 of the Mining Act), staking out one or two lots of one hundred acres each or four half lots of fifty acres each.

The number of claims staked and recorded in the fiscal year ending with March 31st, 1950, was 14,398, an increase of two per cent above the 14,000 claims recorded the preceding year.

J.X. Mercier is the chief of this Branch of the Department of Mines.

Table IV.-Various Titles Issued by the Department of Mines  
(Fiscal Years 1948-49 and 1949-50)

Designation of Title	1948-49	1949-50
Claims recorded at Amos .....	7,106	5,915
Claims recorded at Noranda .....	2,994	2,375
Claims recorded at Quebec .....	3,900	6,108
Totals .....	14,000	14,398
Miner's certificates issued .....	4,425	4,608
Development licenses issued .....	854	746
Development licenses renewed .....	4,793	4,422
Mining concessions, number .....	5	6
Transfers of titles .....	1,431	1,115
Reports of work: days reported .....	303,822	485,149
Reports of work: diamond drilling, feet ....	457,174	295,312

Table V. Titles Issued since 1937-38  
(Fiscal Years)

Fiscal Year	Number of Miner's Certificates	Number of Claims Recorded	Number of Development Licenses(1)	Concessions		Transfers of Mining Rights
				Number	Acres	
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	7,325	2,320	4	1,574	555
1940-41 (2)	965	3,015	1,538	2	1,029	334
1941-42	1,589	4,991	1,936	10	3,765	447
1942-43	1,710	4,420	2,107	4	569	463
1943-44	3,113	8,941	2,788	3	341	978
1944-45	7,303	19,547	4,219	3	726	2,358
1945-46	9,225	26,501	8,676	7	2,566	3,721
1946-47	5,408	16,332	9,885	12	4,475	2,166
1947-48	5,119	16,735	6,858	14	6,065	1,448
1948-49	4,425	14,000	5,647	5	995	1,431
1949-50	4,608	14,398	5,168	6	994	1,115

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

(2) Interim fiscal period of nine months from July 1st to March 31st, owing to change in date of commencement of fiscal year.

Table VI. Comparative Statement of Exploration Work  
on Mining Claims and Licenses During  
Calendar Years 1937 to 1949

Year	Number of Days' Work	Footage of Diamond Drill Holes
1937	910,088	434,903
1938	774,709	317,587
1939	549,580	299,619
1940	335,499	240,370
1941	255,352	169,110
1942	175,338	115,056
1943	40,160	25,913
1944	59,066	37,209
1945	250,846	205,991
1946	1,463,934	1,296,074
1947	3,186,453	2,753,671
1948	772,568	517,526
1949	595,581	345,818

INSPECTION OF MINES BRANCH

R.H. Taschereau, Chief Inspector of Mines, submits the following report, covering fiscal year 1949-50.

The basic duties of this branch comprise: (a) the inspection of mines, ore-mills, quarries, to ascertain that the regulations of the Department in operating are observed, mainly for the protection of workmen from accidents; (b) the administration of the Mine Rescue training in case of accidents; (c) to see that up-to-date copies of underground workings and surface plans are sent regularly to the Department of Mines; (d) to report to the Department on the development and progress of the mining industry in the mine inspection districts; (e) carrying out the provisions of the "Unwrought Precious Metals Sales Act"; (f) to co-operate with the engineering staffs of the mines and their executive officers in the solution of their problems; (g) to report on requests for permits regarding projected tailings-sites and mill-sites and the expediency of granting them, and also to report on requests for permission to export ore-concentrates.

The Province is divided into four inspection districts as follows: No.1 - the Eastern Quebec district; No.2 - the Central district; No.3 - the Western Quebec district; No.4 - the more or less undeveloped area north of the above three districts, and Anticosti and Magdalen Islands.

There were no changes in the district inspection staffs in the fiscal year 1949-50.

In addition to the district inspectors and their staffs, a ventilation engineer, Maurice Lachance, is attached to the Quebec office, in charge of ventilation and dust control. In the fiscal year 1949-50, this officer made ventilation surveys in fifteen mines, which involved the count of 120 samples of air-borne dust, and measurements of air supply in mines and surface plants.

Mine constables and special agents assist the inspectors in various phases of their work, and carry out duties assigned to them by the Minister.

The Inspection Branch records its appreciation of the co-operation received from many sources, and particularly from all the other branches of the Department, from the Quebec Workmen's Compensation Commission, and from mine and quarry operators throughout the Province.

The Mine Rescue Training programme, which was instituted in Western Quebec in 1948, was continued without interruption. A new sub-station was established at the New Calumet mine, under the supervision of the Superintendent of the No.1 (Val d'Or) Station. Fifty-six certificates in Mine Rescue were awarded, and at the close of the period under review, teams had been trained at every producing mine in Western Quebec, with a total of 237 men on the active list. No emergency calls were received during this period.

In the fiscal year under review 507 inspections were made of mines, quarries and gravel pits, and reports of these inspections were transmitted to the Department with information concerning developments and the safety of workmen.

In accordance with the provisions of Section 196 of the Mining Act, all compensable accidents are reported by the mine and quarry operators to the Inspectors, and the latter classify these reports and forward them to the Quebec office. In the case of accidents of a very serious nature, even where no loss of life may have occurred, the inspector makes a thorough investigation and report. These reports, in both French and English, are mimeographed, and copies are forwarded to all the mine and quarry operators, and to other parties interested in mine safety work.

Orders-in-Council enacted during the fiscal year included:

1.- Amendments to Regulations for Safety in Mines and Quarries.

To ensure greater protection of workmen in mines from the danger of fire and explosion, and from accidents in hoisting operations, a number of amendments were made to Regulations for the Safety and Protection of Workmen in Mines and Quarries.

2.- Permission to Export Concentrates Granted to:

Anacon Lead Mines, Limited  
East Sullivan Mines, Limited  
New Calumet Mines, Limited  
Molybdenite Corporation of Canada, Limited  
Normetal Mining Corporation, Limited  
Quemont Mining Corporation, Limited  
Waite Amulet Mines, Limited

3.- Approval of Tailings Sites in Favour of:

Noranda Mines, Limited  
Quemont Mining Corporation, Limited



4.- Sale of Unwrought Precious Metals:

Under the provisions of the Unwrought Metal Sales Act, seven new licenses were issued during the fiscal year. Monthly reports were received from twenty-nine license holders.

GEOLOGICAL SURVEYS BRANCH

The chief of this Branch, I.W. Jones, submits the following report on its activities:

The number of geological investigations conducted by the Quebec Department of Mines during 1949 was slightly higher than in the preceding year, marking a continuation of the increasing activity during the past few years. It may be stated that Quebec holds an enviable position in the amount of geological exploration being done by the provinces of Canada. As previous annual reports have indicated, however, there is much more yet to be done before even an appreciable headway will have been made towards geologically mapping the vast area of the Province of Quebec.

Geological maps and reports issued by governments serve as guides to prospectors, geologists and mining companies in their search for new mineral deposits. In our own province, the discovery, in 1895 of iron-bearing formations by A.P. Low, of the Geological Survey of Canada, some fifty years later lead geologists of private enterprise to the discovery of important iron deposits being developed in what is now known as New Quebec and Labrador. More recently, discovery of ilmenite deposits in the area north of Havre Saint-Pierre, by a geological party of the Quebec Department of Mines, was the forerunner of a large-scale titanium and iron industry now nearing the stage of production.

The field investigations undertaken by the Geological Surveys Branch of the Quebec Department of Mines were in charge of fifteen geologists, four of whom were on the permanent staff of the branch and eleven engaged temporarily - university professors and post-graduate research workers, available for a limited time only.

The areas examined by these geologists and their assistants were:

Northern Abitibi

J.E. Gilbert examined the Lac La Trève area, comprising 200 square miles between latitudes 49°45'-50°00' and longitudes

75°30'-75°45'. The area includes most of the townships of Daine and La Ribourde and narrow strips of Saussure and Guettard townships.

P.E. Imbeault investigated about 320 square miles of territory bordering Maicasagi river, between latitudes 49°45'-50°00' and longitudes 76°15'-76°40'.

D.A.W. Blake covered the east half of the Waswanipi Lake area, comprising about 230 square miles between longitudes 76°15'-76°30' and extending from a line four miles south of latitude 49°30' northward to 49°45'.

M. Tiphane examined the Mazarin area, covering 200 square miles between latitudes 49°00'-49°15' and longitudes 78°00'-78°15'. The area includes parts of the townships of Mazarin, Dalet, Glandelet, Maizerets, Desboues and Miniac.

The areas covered by the first three of these projects lie in the same general region as Bachelor and Capisisit lakes where, with the aid of previous geological work by this Branch, important deposits of gold, silver, lead and zinc have been made. With the examination of these three areas in 1949, geological mapping of a continuous belt of country extending for 200 miles between Mattagami and Chibougamau lakes has now been completed. The fourth area, mostly west of Harricana river, lies about 40 miles northwest of the railway town of Amos.

#### Mistassini Territory

J.M. Neilson continued the programme, begun in 1947, of investigating the geology of the region south of the northeast end of Mistassini lake where, in addition to old Precambrian rocks similar to those found in the country just north of the St. Lawrence, there are some young Precambrian formations similar to those of the Labrador trough. The Témiscamie Mountains area, which was examined in 1949, comprises 100 square miles and lies between latitudes 51°07'-51°15' and longitudes 72°30'-72°45'.

In addition to covering the area just described, Mr. Neilson began the geological mapping of the Takwa area, northeast of Mistassini lake, and completed examining 200 square miles of territory between latitudes 51°15'-51°30' and longitudes 72°45'-73°00'.

#### Gatineau County

P. Mauffette continued the geological investigation of the region bordering the Gatineau and Lièvre rivers and, in 1949,

mapped the Denholm-Hincks area, about 200 square miles in extent, between latitudes  $45^{\circ}45'$ - $46^{\circ}00'$  and longitudes  $75^{\circ}45'$ - $76^{\circ}00'$ . Comprising parts of the townships of Denholm, Hincks, Aylwin, Low, Wakefield and Masham, this area lies about 30 miles north of Hull and Ottawa.

#### Stanstead and Compton Counties

The Coaticook and Malvina areas, in all some 500 square miles in extent, was investigated by H.C. Cooke. Both areas are in the Eastern Townships, bordering on the United States. The Coaticook area lies between latitudes  $45^{\circ}00'$ - $45^{\circ}15'$  and longitudes  $71^{\circ}30'$ - $72^{\circ}00'$ , while the Malvina map-sheet comprises the western or Canadian section of the 15 x 30-minute quadrangle that lies east of the Coaticook area. The formations in this region are mostly metamorphosed and highly folded Palaeozoic rocks of sedimentary origin, intruded by bodies of 'Stanstead' granite which is being quarried at different places for use as a building stone.

#### Portneuf and Champlain Counties

T.H. Clark continued the investigation, which he has been conducting over a period of years, of the St. Lawrence Lowlands between Montreal and Quebec. In 1949, he examined that part of the Grondines area (latitudes  $46^{\circ}30'$ - $46^{\circ}45'$ , longitudes  $72^{\circ}00'$ - $72^{\circ}30'$ ) that is underlain by Palaeozoic limestones and shales.

M. Lunde, mapped the Precambrian rocks that underlie the northern part of the Grondines area.

#### Gaspé Peninsula

H.W. McGerrigle continued investigating the rocks of the Shickshock mountains and the country northward from that high range to the St. Lawrence shore. In 1949, he covered about 200 square miles, comprising the Tourelle area in Gaspé North county. Including parts of Tourelle, Christie, Cap-Chat, Lapotardière and Boisbuisson townships, this area lies between latitudes  $49^{\circ}00'$ - $49^{\circ}15'$  and longitudes  $65^{\circ}15'$ - $65^{\circ}30'$ .

P.C. Badgley examined the New Carlisle area, on the south side of Gaspé peninsula, between latitudes  $48^{\circ}00'$ - $48^{\circ}15'$  and longitudes  $65^{\circ}00'$ - $65^{\circ}30'$ . This area, mostly of Silurian rocks, is in Bonaventure county and includes the whole of Cox and Hope townships and parts of the townships of Garin, Honorat, Weir and Port Daniel. It was investigated as part of the programme of studying areas in Gaspé that may be favourable for the search of petroleum and natural gas.

Saguenay County

P.E. Grenier began geological mapping of the Beetz Lake area, about 40 miles northeast of Havre St. Pierre, which is 400 miles down the north shore of the St. Lawrence from Quebec City. Comprising 200 square miles, the area examined in 1949 lies between latitudes 50°30'-50°45' and longitudes 62°45'-63°00'.

Groundwater, Borings, and Surface Geology

In 1949 the Department of Mines added a geologist to its staff, to meet the growing demands for information and for geological assistance in problems of water supply and to obtain information on the geology of surface deposits which would be useful to engineering and other fields of activity. This geologist, R. DeBlois, is attached to the Geological Surveys Branch. During the year under review, he had occasion to go to many places between such widely separated regions as those of lake St. Jean and Hull to help solve individual problems of water supply. In addition, co-operating with Dr. McGerigle, he examined and recorded the nature of the rocks encountered in the various deep-drilling operations that are being conducted in the search for oil in Gaspé.

Other Work

F.F. Osborne served in an advisory capacity in the geological investigations that were undertaken in the Laurentian or Grenville section of the province, that is the investigations, which have already been mentioned, in the northern part of the Grondines area and in the Denholm-Hincks area. Dr. Osborne also acted in a similar capacity for work in Grenville areas being conducted by the Mineral Deposits branch and, on occasion, he examined various mineral deposits in the southern part of the province.

C. Faessler, on loan from the Mineral Deposits Branch for a short period of two weeks, examined the geology along the Talbot Boulevard, the new highway leading from Quebec, through the Laurentide Park, to Chicoutimi.

E. Aubert de la Rûe was engaged in the office for three months during the summer of 1949, compiling geological and physio-graphical information on New Quebec (Ungava) from various publications, some of which are now out of print, and from some reports and documents that have not been published.

Members of the geological staff represented the Department of Mines and contributed papers at meetings of engineers,

scientists and prospectors held during the year. Some of these contributions, and other articles prepared by members of the staff, were published in various technical and scientific journals.

#### Equipment Section

Arthur Boucher, custodian of equipment, reports to Dr. I.W. Jones that, during the fiscal year 1949-50, instruments and camping equipment were furnished to 33 geological and engineering parties.

With the increasing activities of the geological and engineering branches of the Department, space available to the Equipment Section had become too small and, to remedy the situation, more spacious quarters were acquired in a building at 150 St. Paul Street, Quebec. Although there is inconvenience by being situated at some considerable distance from the main centre of the Department's activities, the new quarters do permit a greater efficiency in storing, classifying and repairing the considerable amount of material that is used by the various technical branches.

On moving this Equipment Section in November, 1949, custody of the large departmental collection of photographs and lantern slides, which until then had been kept in this Section, was transferred to the Division of Technical Information.

#### MINERAL DEPOSITS BRANCH

Bertrand T. Denis, Chief of this Branch, reports as follows on the activities during the past fiscal year:-

The technical officers of this Branch make geological investigations of mineral occurrences, mining properties or mining districts with a view to furthering the development of the mineral industry within the Province. Technical advice is given to prospectors and to companies engaged in exploration and development.

During the summer and early autumn, nine parties were in the field, and in addition the resident geologists stationed at Rouyn and Val d'Or made examinations of mining properties under development in each of their respective fields.

P.E. Bourret, Mining Engineer in charge of Industrial Minerals Technology, examined 63 mines, quarries and prospects in the southern parts of the Province. The purpose of these visits is to advise the owners on the economic value of the deposits concerned and

to furnish information regarding the development, mining and milling operations, and the marketing of their products. Special attention was paid in 1949 to feldspar deposits in the Buckingham area.

H. Girard surveyed, took samples for laboratory study, and mapped the St. Luc, Ianoraie, Farnham and Rivière du Loup peat bogs. Samples for laboratory study were also collected from the St. Charles, Ste. Catherine and Lac-à-la-Tortue bogs. Furthermore, the establishments of six operators working in peat bogs were visited in the course of the field season.

R.B. Graham made a detailed geological study of the southwest quarter of Lesueur township. Within this area in the Bachelor Lake district, deposits of gold and of base metals of economic importance are under development by O'Brien Mines Ltd., and Dome Exploration (Quebec) Ltd.

W.N. Ingham, resident geologist for the eastern half of the Western Quebec Mining Belt, completed the compilation, at a scale of one inch equals one thousand feet, of the geology of the townships of Malartic and Fournière. In addition, preliminary draughts of the compilation of the geology of the townships of Vassan and Senneville were made at the same scale. Eight mining properties upon which exploratory diamond drilling was in progress during 1949 were visited and reports on progress of exploration prepared.

Burdett Lee commenced detailed geological mapping of a strip of territory lying to the north and south of the southern boundary of the townships of Roquemaure, Palmarolle, Poulariès and Privat. The purpose is to guide exploration in the vicinity of a strong shear zone near which gold and base metal mineralization has been found by prospectors.

R.L. L'Espérance made a detailed geological map of the northeast quarter of Duprat township in the Rouyn section of the Western Quebec Mining Belt.

J.E. Riddell continued a programme of research on Wall Rock Alteration in the Vicinity of Sulphide Deposits in Western Quebec. Part of the field season was spent in the laboratories of the Department developing a technique for the determination of traces of base metals in rocks by the dithizone method. This work was done in collaboration with the Laboratories Branch. The areas in the vicinity of the Normetal and Aldermac deposits were studied in the field, and some preliminary studies were made on the waters in the Western Quebec Mining Belt with a view to establishing the feasibility of the application of geo-chemical prospecting methods.

W.G. Robinson, resident geologist for the western half of the Western Quebec Mining Belt, completed compilations of the geology of northeast and southwest quarters of Duprat township. A compilation of the geological structure of the Rouyn-Noranda area, at a scale of one inch equals one mile, was also completed. Fifteen mining properties under active development were examined and reports on progress prepared.

J.R. Smith made a detailed geological study of an area of about 20 square miles in the vicinity of the Anacon Lead Mine in Portneuf county. This property, formerly known as the Tétreault mine, is one of the two lead-zinc producers in the Grenville geological sub-province in Quebec. Reports of successful exploratory work on the Anacon property has greatly stimulated the interest of prospectors in the area.

G.W. Waddington made an investigation of possible raw materials for the manufacture of cement, in the area east of Deschambault and along the south shore of the St. Lawrence river. Thirty-four localities were examined and sampled. Sixteen deposits of other minerals in the southern part of the Province were examined and reported upon.

W.W. Weber continued detailed geological surveying of an area centered about Amos, and, during the year, he completed the study of the western half of ranges I to IX, Dalquier township; lots 1 to 33, ranges VIII to X, Figuary township; lots 1 to 64, ranges VI and VII, Figury township, and lots 1 to 50, ranges VI, VII and VIII, Landrienne township.

This branch is responsible for the acceptance of reports, maps and diamond-drill logs submitted in support of applications for credit towards assessment work requirements through geophysical or detailed geological surveys and diamond drilling. During the year, 49 geophysical reports and maps were examined, as well as 39 detailed geological surveys and 187 diamond-drill logs. In addition, 70 reports or prospectuses were studied at the request of the Registrar, Quebec Securities Act. Finally, 6 engineers' reports submitted in support of applications for mining concessions were studied. Most of the cases have to be studied and investigated individually and many are the subject of a detailed report.

The search for new mineral deposits throughout the Province was pursued by prospectors and companies engaged in mining exploration. Perhaps the most noteworthy feature of the year's activities in this field was the interest shown by prospectors in widely separated portions of the Province.

DIVISION OF TECHNICAL INFORMATION AND

DISTRIBUTION OF PUBLICATIONS

The division of Technical Information and Distribution of Publications has charge of collecting all technical information concerning the mineral resources of the province of Quebec, and of answering enquiries and requests for available information on this subject.

Jean-Paul Drolet, mining engineer, with his assistant Jean-M. Lapointe, submits the following reports as follows on the work of the division during the fiscal year ending March 31st, 1950. Jean Lapointe resigned from the division after eight years of useful service and collaboration in this division. He was replaced by Noé Lamontagne in February, 1950.

A.- Requests for information concerning mining companies .....	170
Various enquiries and correspondence on technology, mineral collections for education purposes, annual reports of mining companies .....	313
B.- Requests from the public for publications of the Department of Mines .....	4,397
Publications sent out, on requests from members of the staff .....	1,490
Mailed card notices of issues of new publications and of periodical communiqués.	5,158

During the fiscal year in question the distribution staff of the division sent out 16,720 individual copies of the Department of Mines publications, in answer to 3,691 written requests from the interested public, and 2,795 copies sent out without requests.

Moreover 706 visitors who came personally were given or sold 4,051 copies of our publications. The number of copies of reports sent out from the Department of Mines totalled 23,566, in answer to 5,887 requests.

During the fiscal year 1949-50, the editions of the new publications of the Department numbered 33,242 copies which were duly delivered to the division by the various printing establishments.

This division carried out the work of compiling and classifying numerous reports, plans, and maps sent in by the inspectors of mines, and outside technicians; technological pamphlets concerning mining industry and mining companies. It has also established



a new system of classification by subject, township, lots and range, of all geological reports and plans of the Department of Mines and outside sources.

This division also collects, compiles, classifies and prepares an index of all items concerning the mining industry, mining companies cut out of technical reviews and mining newspapers.

In addition to the functions mentioned above, the division prepared the notices, notifications, advertising matter and articles for the newspapers, technical reviews and periodicals, by which the Department gives notice of the issue of new reports, maps, and works on the geology, mineral deposits and resources of the Province and of its mining industry. These publications are the results of the field-work of the geologists, engineers and chemists of the Department of Mines. This division distributes these reports, maps and other works and information on the mineral resources of the Province to the interested public. A list of these publications may be obtained on request addressed to the Quebec Department of Mines, Quebec.

#### LABORATORIES BRANCH

The Laboratories Branch comprises the following sections: I.- The laboratories of mineralogical and metallurgical research, established by a law which was adopted by the Legislature in 1949 and assented to on February 17th of that year; II.- the laboratories of chemical analyses and assays of the Department of Mines established at Quebec, Montreal, and Thetford Mines; III.- the sampling and ore dressing plant at Val d'Or; IV.- the university courses in prospecting; V.- the Department of Mines' museum, and displays at exhibitions.

The director of this branch is Maurice Archambault and the assistant-director is P.-E. Pelletier. The manager of the sampling and ore dressing plant is G.S. Grant; and Henri Boileau is chief of the chemical analyses laboratories.

#### I.-Research Laboratories

Owing to the new equipment of apparatus now available, these laboratories are now in a position to perform research work which could not be undertaken before. Among the new instruments acquired it is fitting particularly to mention the following:

1- A Leitz differential dilatometer, functioning in vacuum or at atmospheric pressure;

2- A Chevenard thermobalance, which makes a continuous photographic record, and which gives the gain or the loss of weight of a substance, in the course of its being heated, in terms of the time or of the temperatures.

3- A Chevenard thermomagnetometer, a very sensitive instrument which measures the variations of the magnetism in bodies, in terms of the temperature;

4- A Unicam heating camera for the diffraction of X-rays, used in the study of the variations in structures of crystalline bodies;

5- A Rutherford polarograph, with a rapid automatic recording appliance, for the study of radioactive bodies, including minerals;

6- A large Leitz-Panphot microscope, for metallography and petrography, which allows making micro-photograph magnifications up to two-thousand diameters;

7- A Berek micro-photometer to measure the reflecting power of ores or minerals in polished sections;

8- An excellent Leitz intense light monochromator.

The research work effected during the fiscal year aimed to increase the value of the peat resources, of our iron, titanium, zinc and gold deposits, and also waste substances from the treatment of certain mining processes, such as arsenical waste. These researches were of mineralogical, chemical, physical and metallurgical natures.

Joseph Risi, Charles E. Brunette and Dorothy Spence, studied the properties of the peat from bogs situated at Lac-à-la-Tortue, Lanoraie and Farnham. They worked on the improvement of a process of extracting the wax and resinous matters of peat from bogs at Clair and Lac Tortue, and on a new method of analysis of peat.

Georges Welter and J.A. Choquette have designed and constructed a special electric furnace, with tungsten electrode, aiming at the production of titanium alloys of strictly determined composition. They have successfully synthesised a number of such alloys of this metal and have studied their metallurgical properties. The tests of forging and rolling gave excellent results.

Claude Frémont made a systematic study of various electronic circuits which would allow constructing a miniature magnetometer small enough to be used in drill holes, to measure the variations

of the magnetic fields, in terms of the depths. He also studied various magnetic alloys which could be used in the construction of instruments to detect hidden mineral deposits.

B.J. Walsh worked on the following research subjects:

- the behaviour of concentrates of zinc products submitted to electrolysis. The concentrates studied were all from Quebec province deposits;

- the possibilities of effecting the separation of sphalerite, christophite, and marmatite of Quebec zinc concentrates by magnetic processes;

- studies on the ore and the tailings of Sullivan Consolidated Mines, to reduce to a minimum the losses of gold in the waste heaps.

Jean Lanerville made a comparative physical study of iron ores from New Quebec and from foreign deposits. The tests made on these samples aimed to determine their characteristic properties, among which were the sintering point, the fusion point, porosity, disintegration, differential reactivity and others.

Fernand Claisse worked, and succeeded, to improve a new method of determination of plagioclase feldspars based on the diffraction of X-rays. In his research he was assisted by Jean Girault, who identified by optical methods a set of feldspars which served as standards.

Pierre Grenier devised a new process of refining the arsenic which is extracted as waste in the course of treating the ore from some of the Quebec mines. The object of this work is to find uses for this product as there is virtually no market for raw arsenic.

Benoit Nolin studied means to utilize the flame spectrophotometer to rapid assays of rare earths and alkaline earths substances.

Constance Tousignant effected spectrographic research on various pyrites of the province having in view the determination of their relative ages and their relation to certain ore deposits and other mineral deposits.

II.-Laboratories for Chemical  
Analyses and Assays

In the course of the fiscal year these laboratories received 9,985 samples on which were performed 49,242 analyses, assays and determinations. These figures comprise the quantitative chemical operations, and determinations by microscope, spectrograph. X-rays, and also radioactivity measurements.

These were distributed as follows:

Table VII.-Summary of Analytical Work Done in Laboratories

	Laboratories			Totals
	Quebec	Montreal	Thetford Mines	
Samples received .....	9,081	735	169	9,985
Quantitative analyses .....	13,569	1,737	496	15,802
Qualitative determinations .....	19,425	-	-	19,425
Spectrograph examinations .....	9,570	-	-	9,570
X-rays examinations .....	3,908	-	-	3,908
Radioactivity determinations ....	537	-	-	537
Totals .....	47,009	1,737	496	49,242

The work of the Thetford laboratory is restricted to physical tests on the quality and classification of asbestos fibres. The Montreal laboratory does routine quantitative analyses and assays and qualitative determinations.

The main laboratories are located at Quebec and comprise:  
1.- a division of mineralogy and petrography; 2.- a division of spectrography, radio-activity; 3.- a division of chemistry; 4.- a division of metallurgy.

Mineralogy and Petrography Laboratory

In the course of the fiscal year under review, 1949-50, the mineralogists examined 7,141 mineral samples, which requested 19,172 determinations, of which 227 required optical examinations and 26 microscope studies of thin sections.

They also have charge to dispatch, to the suitable laboratories, the various samples and specimens received for analysis, according to their mineralogical nature or whatever research work to be effected on them.

The mineralogists are also called upon to answer enquiries and requests for information regarding the economic possibilities of mineral samples and specimens submitted, and to give advice thereon.

Spectrography, Radiocrystallography  
and Radioactivity Laboratory

In the course of the fiscal year ending with March, 1950, the personnel of this laboratory effected 14,015 operations distributed as follows: 9,570 spectrographic analyses, 3,908 radiocrystallographic determinations and 537 radioactivity measurements.

The large increase in the number of these measurements is an evidence of an expansion of the interest of prospectors in the search for radioactive minerals.

A new spectrograph with a quartz prism of average dispersion has been added to the equipment of the laboratory.

Chemical Laboratory

In the course of the fiscal year under review the personnel of these laboratories effected 13,566 analyses and fire assays all checked by duplicates. Of these, 6,730 were fire assays of precious metals and 6,839 quantitative wet analyses.

The number of analyses for rare metals - uranium, thorium, beryllium and zirconium - was appreciably higher than in previous years.

Complete geochemical precision analyses were made of eight samples of iron ore from Ungava, two samples of talc, five samples of apatite and 33 samples of typical rocks.

Laboratory of Metallurgy

B.J. Walsh carried out magnetic concentration tests on siliceous iron ore and on a concentrate of pyrite and pyrrhotite.

III.- Sampling and Ore Dressing Plant

This plant is located near Val d'Or in Abitibi-East county.

Sampling Plant

Table VIII.-Samples of Ores Received at the Plant for Bulk Sampling

Sent by	Type of Ore	No. of lots	Weight (pounds)
Beryllium Corporation of Canada .....	Beryllium	4	1,585
Dr. E. Grondin, Val d'Or .....	Gold	1	117
Roybar Uranium Gold Mines, Ltd. ....	Gold	3	2,298
		8	4,000

Ore Dressing Plant

Table IX.-Shipments of Ore Received for Treatment and Extraction of Gold and Silver

Shipped by	No. of lots	Weight (pounds)
Deloro Smelting and Refining Co. Ltd. ....	1	12,786
Macho River Gold Mines, Ltd. ..	5	14,405
Louvicourt Goldfields, Ltd. ....	2	19,705
Consolidated Duquesne Mining Co. Ltd. ....	13	93,274
	21	140,170

Extraction of the precious metals (fine) was 870.369 ounces of gold and 2664 ounces of silver.

Trebor Mines Limited sent two bulk samples of ore of 3,225 pounds total weight, for concentration tests in plunger jigs.

IV.-University Courses on Mineral  
Prospecting

As a complement to the elementary courses on prospecting, and to give to the prospectors a broader knowledge of the science and the technique which would aid them in their pursuits, the Quebec Department of Mines, since some years past, subsidizes university courses in prospecting for minerals.

Thanks to the collaboration of the universities, prospectors may now register in the science faculties to take a five week course of lectures on scientific prospecting. Under the professors, who are authorities on the subjects of chemistry, geology and mineralogy, the students are able to improve their knowledge in these sciences, and their technique by excursions in the field guided by the lecturers.

Last year these lectures were given at the Ecole Polytechnique of the University of Montreal, from March 7 to April 9. Of the twenty-three students who registered, eighteen were granted the certificate of having successfully passed the final examinations.

V.-Museum and Displays at Exhibitions

The following accessions to the Museum collections were received during the year under review:

Two specimens of native gold, from the Lamaque Gold Mines Limited, a gift from the Company.

Specimens of pyrite and chalcopyrite from the Queмонт mine, a gift from the Queмонт Gold Mines, Limited.

Specimens of asbestos fibre from the Munro township, Ont., a gift from the Canadian Johns-Manville Corporation.

Nine samples from the East Sullivan Mines, Limited, a gift from the Company.

A specimen of rolled pure titanium metal, from the first successful tests of rolling titanium in Canada, by professor Georges Welter of Ecole Polytechnique of Montreal.

The Quebec Department of Mines took part in the regional exhibitions of Sherbrooke and Trois-Rivières.

In these two cities the Department had taken as theme for the exhibits "Quebec Forward!". The main display illustrated in the same panel the old forges of the Saint-Maurice Valley established in 1733 (the Past); the model of a modern mine (the Present); and the immense iron deposits of New Quebec which are being developed (the Future).

This exhibit greatly interested the visitors to the exhibitions of the two cities.

Laurent Bédard is in charge of the museum and of displays at exhibitions.

#### DRAUGHTING AND CARTOGRAPHY BRANCH

Léon Valois, P. Eng., is chief of this Branch, and Armand Blanchette, assistant-chief. There are nine draughtsmen and a stenographer.

Field maps were compiled and prepared for the field-work of the geological parties of the Department of Mines, and several maps, some final and others preliminary, were compiled from previous field notes of the chiefs of geological parties, and were prepared for printing and publication.

The branch compiles and draws all plans required by the other branches of the Department.

Two sets of township maps on tracing linen, are carefully kept up to date; on one of these are drawn the outlines of all mining claims in good standing, and on the other set are shown the boundaries of mining properties and lands held by mining companies. The first set which shows the claims staked-out comprises 481 tracings on which were traced 14,398 new claims during the year; the second series comprises 160 tracings. From all these tracings 7,812 blue or black prints were struck off during the year to satisfy requests from the interested public.

The following geological maps were prepared during the year by the Branch, which also supervised the printing of them.

#### Final maps (coloured)

##### a) Completed

Eastern part of Gaspé peninsula

No. 661 - Upper York sheet

No. 662 - Dartmouth River sheet



Eastern part of Gaspé peninsula (cont'd)

- No.663 - Gaspé Sheet
- No.664 - Saint-John River Sheet
- No.665 - Malbaie Sheet
- No.692 - Vertical sections
- No.693 - Vertical sections
- No.667 - Lake Forget Area
- No.672 - Lake Wakeham Area
- No.676 - Upper Romaine River Area
- No.686 - 687 - 688 - 689 - Pérignon River Area (in black only)
- No.808 - Taibi Area
- No.816 - Razilly Area

b) In Press

- No.818 - Mingan to Aguanish
- No.819 - Aguanish to Washicoutai
- No.820 - Cawatose Area

c) In preparation

- No.799 - Montreal Area (sections)
- No.800 - Montreal Area, Laval
- No.801 - Montreal Area, Lachine
- No.807 - Belleterre Area
- No.821 - Hébécourt West
- No.822 - Hébécourt East
- No.823 - Duparquet West
- No.824 - Duparquet East
- No.825 - Destor West

Preliminary Maps

- No.619 - Lac St-Jean-Chibougamau road
- No.619G- Lac St-Jean-Chibougamau road (geological 2 colours)
- No.642 - St-Lawrence Lowlands (reprint)
- No.675 - Hébécourt Lake Area (reprint)
- No.681 - Waswanipi Lake Area (West half, reprint)
- No.691 - Goëland Lake Area (reprint)
- No.694 - Portneuf (reprint)
- No.695 - Branssat Kreighoff (reprint)
- No.698 - Chaste (reprint)
- No.770 - West half Hébécourt (2 colours)
- No.781 - Part of Landrienne and Duvernoy (2 colours)
- No.782 - Part of Dalquier and Figuery (2 colours)
- No.784 - Part of Lesueur (2 colours)
- No.786 - Lac La Trève
- No.786 - Lac La Trève (reprint)
- No.826 - Maicasagi Lake
- No.826 - Maicasagi Lake (reprint)

- No.827 - Waswanipi Lake area (West half)
- No.828 - Montauban-les-Fines area
- No.830 - Denholm-Hincks Area
- No.831 - Mazarin Area
- No.832 - Beetz Lake Area
- No.833 - Northeast Part Duprat
- No.836 - Témiscamie Hills Area
- No.837 - Grondines Area
- No.838 - Sagard-Callières area (2 colours)
- No.839 - Amulet Mine map, Dufresnoy township
- No.840 - Amulet Mine map, Dufresnoy township

Our draughtsmen traced on linen forty-four geological plans, for records (not for publications); thirty-two plans of machines, plans and other drawings as well as twenty-five figures for illustration of final reports.

The Branch during the fiscal year also completed all the drawings for illustrating the third volume of "Geology of Quebec" and preparing them for reproduction, in all seventy-nine figures.

#### CIVIL ENGINEERING BRANCH

L.A. St-Fierre, P. Eng., is chief of this branch which consists of two distinct divisions:

Division of Mine roads and Division of Mining Villages. For the purpose of this report, these two divisions are reported upon separately.

#### Division of Mine Roads

Since 1937, when the Division of Mine Roads was established, to provide a distinct agency aware of the transport problems facing the mining industry and capable of solving them, a total of 1,269.79 miles of mine roads has been built at a total cost of \$11,919,074.19. During the fiscal period under review, 34.83 miles of new roads was built and 28.8 miles of existing roads was improved or repaired, the total cost of these operations being \$1,766,361.86 of which amount \$4,250.00 was contributed by mining interests benefiting from these roads. Hereunder are listed the new roads built during the period under review.

<u>Counties</u>	<u>Road</u>	<u>Length in Miles</u>
Roberval and Abitibi-		
East .....	Chibougamau Road .....	25.80
Abitibi-West .....	Rapide Danseur to Ontario border, township of Hébécourt .....	3.88
Papineau .....	Quebec Smelting and Refining .....	1.50
Papineau .....	Burke Brothers Quarry .....	0.55
Rouyn-Noranda .....	Quesabe Mines Ltd. ....	3.10

Chibougamau Road

A section of 25.80 miles was completed, bringing the road to within 0.8 mile of the southern boundary line of the village being established on the shores of Lake Gilman. This road is now completed over a length of 144.31 miles from the railway station at St.Félicien, Que., with a section of 1.4 miles remaining to bring the road to the intersection of the main street of the village.

A coat of crushed gravel was laid on the section 13.0 miles in length, from mileage 21.6 to mileage 34.6 built in 1945. This became necessary due to the low quality of gravel used during the construction of this particular section of the road, it being impossible to locate a higher grade of material in the particular area. A volume of 32,604.39 tons of crushed gravel was utilized for this purpose at a cost of \$54,632.08. In addition to the above, a further section of 62.0 miles was patched with 16,277.0 tons of crushed gravel at a cost of \$41,819.05.

During the period under review, two bridges were built on this road to replace wooden structures which had become unserviceable and a hazard to traffic:-

1) A bridge over Rivière Boisvert, 165.4 feet in length, with concrete piers and abutments, continuous steel beams and a concrete deck, at a cost of \$102,238.82;

2) A bridge over Rivière du Cran, 130.4 feet in length, with concrete piers and abutments, continuous steel beams and a concrete deck, at a cost of \$82,550.76.

Our branch wishes to acknowledge the whole-hearted co-operation afforded by the engineers of the Department of Public Works for acting as consultants on these projects.

In addition repairs were made to existing wooden bridges over Queylus Bay (Southwest Arm) and Rivière Chibougamau, as well as to bridges of lesser importance.

Plans were also prepared to replace wooden bridges now spanning Rivière Pemonka (Rivières aux Trembles) and Rivière Dufresne, the former by steel beams and a wooden deck and the latter by a concrete structure, capable of withstanding heavy traffic.

A survey was also initiated during the summer months to set up mile-posts throughout the entire length of the road. All work described above was under the supervision of H.A. Gray, P. Eng., assisted by Serge Godbout, P. Eng.

In addition to the above, a survey party, headed by Philippe Landry and consisting of 12 men, started on the 16th November, 1949, locating the following roads:-

1) From Lake Gilman to Lac Bourbeau, an approximate distance of five miles;

2) From Lac Bourbeau to Lac Waconachi, an approximate distance of ten miles;

3) From the Lake Gilman-Lac Bourbeau project to Gwillim Lake, an approximate distance of 3.5 miles.

This work was completed in the field about the middle of March, the plans, profiles and estimates of these projects having been prepared in our office during the winter months.

#### Road through Hébécourt Township

Work on this road began in 1947 and was completed during this fiscal year. This road leads from Rapide Danseur to the Quebec-Ontario border and will eventually tie in with a road being built by the Ontario Government from the provincial boundary line to the town of Matheson. A section of 3.88 miles in length was completed during the year bringing the overall length to 11.43 miles. This road has opened a whole new section in the northwestern part of the Province and it can be anticipated that it will contribute in a large measure towards developing trade, mining, colonization and lumbering activities. In view of its importance from a colonization view point, the Department of Colonization has shared in the cost of its construction to the extent of \$75,000.00.

Work on this project was under the supervision of A.N. Richer, resident supervisor.

Winter Road to Bachelor Lake

This road was built to give winter access by tractor trains to the mineralized area in Bachelor Lake district where important preliminary mining work is being carried out. This road starts immediately south of Lake Cameron, on the Senneterre-Lac Madeleine road, 75 miles north of Senneterre, and heads northeastward to the shores of Bachelor lake.

Road to Anglo Rouyn Mines Limited

Ore from the Anglo Rouyn Mines, Ltd. is treated at the Powell Rouyn Gold Mines, Ltd. Transport of this ore necessitated improvement of a section of the road 1.1 mile in length between these two mines.

Road to Marl Deposit at Lake Levasseur

Work, consisting mainly in drainage and gravelling, improved the road leading from the Ste. Anne des Monts-Gaspé Lake road to a deposit of marl known as Lac Levasseur, in the township of Cap-Chat.

Road to Quemont, Donalds and MacDonald Mines

This road, 9.2 miles in length, was built during 1947 and 1948 in the township of Rouyn. Very heavy transport of ore on a certain section necessitated the reinforcement of the road bed by additions of gravel.

Road to Quebec Smelting and Refining Limited

This road, 1.5 miles in length, in Portland (West) township, Papineau county, is also known as the High Rock mine road. The mine had been closed for a certain number of years, and, in the spring of 1949, Quebec Smelting and Refining Limited undertook to reopen it. For this reason, the road, which had not been maintained since the mine was closed, had to be improved. These improvements consisted mainly in drainage and gravelling.

Road to Burke Brothers Mine

This road, 0.95 mile in length, had to be built to give access to a feldspar deposit mined by the Burke brothers, in range XI, of the township of Buckingham, county of Papineau. Deposits were inspected by our engineers, who recommended the building of this road.

Road to Marvel Granite Reg'd

Work on this road consisted of rebuilding a small bridge and gravelling a section 2.5 miles in length in Bourg-Louis, county of Portneuf, in order to give access to an operating granite quarry.

Road to Les Escoumains Peat Bog

Construction of this road, 2.0 miles in length, was started in 1948, but was completed only the following year. This road leads from the main highway between Tadoussac and Les Escoumains, to a peat bog north of Les Escoumains.

Road from St. Antoine de Pontbriand to Flintkote Mines Limited

Improvements of this road, 2.0 miles in length, were necessitated by its use by the miners living in St. Antoine de Pontbriand and working at Flintkote Mines, Ltd.

Road to the Broughton Soapstone Quarry

The 15th Range road, 1.3 miles in length, in the municipality of Leeds-East, Mégantic county, was improved at the request of Broughton Soapstone and Quarry Limited, and is used for the transportation of its products to Broughton station of the Quebec Central railway.

Road to the Quesabe Mine, Rouyn-Noranda County

Ore from the Quesabe Mine, in Duprat township, Rouyn-Noranda county, is hauled for treatment to a mill near Noranda. Transport has to be made over a section of colonization road, 3.1 miles in length, which had to be improved in order to withstand the heavy traffic.

Road to the Poisson Quarry

This road was built by Mr. Majorique, in order to operate the granite quarry at Labelle.

Road to the Victoria Quarry

This road was built by the Victoria Mountain Granite Co. to provide an outlet from their granite quarry on lot 46, range II, township of Hampden, Compton county, to the road from Scotstown to Val Racine.

Destor Township Road, Abitibi-East County

Our Department paid for the crushing of 15,000 cu. yards of gravel. The cost of laying the gravel was paid jointly by the Department of Mines and the Department of Roads.

During the fiscal period under review, the Civil Engineering Branch maintained 148 miles of existing mine roads, at a cost of \$80,610.29, as follows:

<u>Counties</u>	<u>Road</u>	<u>Length in Miles</u>
Bonaventure ....	Grand Cascapedia River road .....	37.00
Rouyn-Noranda ..	Quemont, Donalds and MacDonald mine roads .....	9.20
Rouyn-Noranda ..	Elder Gold Mines Ltd. ....	1.0
Roberval and Abitibi-East ..	Chibougamau road .....	86.40
Abitibi-West ...	Road in Destor township .....	5.30
Mégantic .....	Flintkote Mine to St. Antoine de Pontbriand .....	2.00
Mégantic .....	15th Range road (Soapstone Quarry) ...	1.43
Portneuf .....	Marvel Granite Reg'd .....	2.50
Matane.....	Road to Lac Levasseur .....	3.70

Maintenance of Winter Roads

During the winter of 1949-50, the Civil Engineering Branch paid a total of \$21,843.50 towards the cost of maintaining 407.05 miles of winter roads in the northwestern section of the Province. Hereunder is a list of roads so maintained.

<u>County</u>	<u>Road</u>	<u>Length in Miles</u>
Abitibi-East ...	Amos to Siscoe Gold Mines Ltd. ....	37.30
" "	Amos to Goldvue Mines Ltd. ....	30.00
" "	Siscoe Gold Mines Ltd. to Val d'Or ...	5.25
" "	Val d'Or to Norbenite Malartic Mines Ltd. ....	10.50
" "	Val d'Or to Colombière .....	10.00
" "	Colombière to junctions of Highways 58 and 59 .....	6.50
" "	Junction of Highways 58 and 59 to Senneterre .....	23.00

<u>County</u>	<u>Road</u>	<u>Length in Miles</u>
Abitibi-East ...	Intersection of Highways 58 and 59 to the bridge over Louvicourt river ....	1.00
" "	Highway 59 at Pascalis to Pascalis railroad station, thence to Perron Gold Mines Ltd. ....	8.20
" "	Norbenite Malartic Mines Ltd. to Heva Corner .....	15.30
" "	Heva Corner to Cadillac .....	9.00
" "	Heva River to Lamotte .....	10.00
" "	Senneterre to Croinor Pershing Mines Ltd. ....	30.00
Abitibi-West ...	La Sarre to Duparquet .....	22.70
" "	La Sarre to the junction leading to Normetal Mining Corporation .....	19.50
" "	Normetal Mining Corporation to the La Sarre Highway .....	6.00
" "	Duparquet to Waite Amulet Mines Ltd. ..	25.8
Rouyn-Noranda ..	Section of Highway 46 between Waite-Amulet Mines Ltd. and Rouyn .....	6.00
" "	Rouyn to Cadillac railroad station ....	30.00
" "	Highway 46 from Rouyn to the Ontario border .....	24.00
Témiscamingue ..	Belleterre to the Ontario border via Notre-Dame-du-Nord .....	77.00

Peat Bog Drainage

Pursuant to a policy adopted by the Government of Quebec, the Civil Engineering Branch gave grants totalling \$16,563.51 to certain operators of peat bogs to assist them financially in the drainage of their properties. Bogs so assisted were as follows:

<u>Locality</u>	<u>Operator</u>	<u>Length of Trenches (Feet)</u>
Isle-Verte .....	Paul Côté .....	3,456
" "	Alexandre Michaud .....	3,490
St-Fabien de Rimouski.	St-Fabien Inc. ....	6,840
" " " "	J.A. Boulanger .....	13,500
" " " "	Ernest Roy .....	7,525
Rivière-du-Loup .....	Maple Leaf Peat .....	32,118
St-Ulric-de-Matane ...	J.B. Desrosiers .....	13,557



(Cont'd)

<u>Locality</u>	<u>Operator</u>	<u>Length of Trenches (Feet)</u>
St-Ulric-de-Matane ...	Roméo Roy .....	16,520
" " " "	Tourbière de la Rivière Blanche	18,482
Pointe-au-Père .....	Dr. Reid .....	15,500
Les Escoumains .....	J. Oscar Dubois .....	<u>33,374</u>
		164,362

Division of Mining Villages

Bourlamaque

The population of the town of Bourlamaque increased by 338 persons during the period under review. Over 100 building lots were subdivided on part of the mining concession of Lamaque Mining Company Limited. They have been placed on sale and dwellings have been built on them. During the past year, 3.4 miles of streets was asphalted. This town now possesses 2.8 miles of concrete sidewalks and the length of watermains and the sewerage system is over four miles in length. The population of this town has now reached 2,398 persons. The number of dwellings is 508 and that of business establishments 39.

Val d'Or

This town although established only 15 or 16 years ago, now has a population of 10,561 persons and is the financial and commercial hub of a fluid population of 25,000 persons. Civic authorities have instituted a long-range programme of town-planning which so far has produced a real-estate development consisting of 44 duplexes and another development now in process of realization and which will consist eventually of 100 units. The increasing population necessitated considerable increase in the waterworks system and the pumping-station has now a daily capacity of 5,000,000 gallons. Sewerage disposal system has also increased to a length of 54,650 lineal feet. The town of Val d'Or now consists of 2,280 dwellings and the 12 hotels barely suffice to take care of the transient population. A sports arena, capable of seating over 5,000 persons, is nearing completion and will render appreciable services to a community where no other large meeting place is available.

A landing-field has been completed and Quebec Airways Ltd. has instituted a daily schedule between Montreal and this town.

A 100-bed hospital is now completed. A church has been built and a new parish has been organized in the southwest section of the town.

### Cadillac

With a population of 1,598 souls, Cadillac owes its existence mainly to the O'Brien Gold Mines Limited situated nearby.

The closing of New Central Cadillac Gold Mines Limited was a heavy blow to this district.

### Malartic

The town of Malartic has now reached a total population of 5,276, and is the operating basis of four producing gold mines which, during the period under review, employed 1,416 persons. The town now has 536 houses, numerous business establishments, six hotels and two theaters.

### Rouyn

The town of Rouyn, recently attained the status of a city, its population being over 12,000 people. It is also the financial hub of a fluid population of some 30,000 in the northwestern part of the province. Our branch is particularly interested in the section known as South Rouyn which is situated on Crown land. During the period under review, 18 building lots were sold, a classical college has been opened by the Oblate Fathers, thus filling a long felt need in this section of the Province.

The city of Rouyn has instituted a long-range programme of civic improvements, notably the extension of waterworks and sewerage systems, paving of streets and laying of sidewalks and the rebuilding of a modern City Hall to replace the insufficient wooden structure which was destroyed by fire two years ago.

### Noranda

As in the case of other towns and villages in the mining districts, the town of Noranda, with its population of 7,380, is developing rapidly. This town can be held as an example of intelligent co-operation between mine owners and the general population as it is considered as a model of town planning throughout the Province. Although the important Noranda mines and smelter are the main employers in this town, trade is being accentuated and has attracted varied outside interests.

### Town of Belleterre

This town owes its existence to the Belleterre (Quebec) Mines Limited, which is situated in its immediate vicinity and affords

gainful employment to the majority of the population of the town. Should plans now under consideration materialize, the daily output of the mine will be increased from its present capacity of 250 tons to 1,000 tons, thereby necessitating additional labour. Logging and farming operations are restricted in this area.

During the period under review, the town council approved the construction of some 6,000 lineal feet of concrete sidewalks, the cost of which was reimbursed to the town authorities from the Municipal Fund of Belleterre. Long-range planning also provides for additional concrete sidewalks and the eventual paving of all streets of the town.

Mine officials take a real interest in the town's welfare which is reflected in the neat and cheery appearance of the houses and the orderly layout of the town.

#### Village of Chibougamau

In order to implement preliminary work carried out in previous years, the Department retained the services of a land surveyor to proceed with the compilation of a topographical plan of the area selected for the site of the village of Chibougamau, and for the subdivision of a section into building lots. This work was carried out during the winter months, the surveyor being assisted by technicians and labour supplied by our Division. This subdivision resulted in a total of 385 lots, which our Division intends placing on sale during the coming summer to form the nucleus of this new village. In addition to the above, suitable lots of sufficient dimensions were set aside for eventual use for religious, scholastic and recreational purposes.

#### DIVISION OF MINERAL STATISTICS

C.-O. Beaudet, chief of the Division of Mineral Statistics, submits the following report.

The main function of this division is to collect, monthly and annually, figures of statistics relating to the mineral industry of the province of Quebec.

A part of these figures relating to the annual mineral production, after they have been compiled and checked, are published in the annual report of the Department of Mines entitled The Mining Industry of the Province of Quebec.

The monthly statistics, which deal only with the main products of the mineral industry of the Province, are published in monthly and quarterly bulletins of which some 325 copies are distributed to people interested in them, comprising daily newspapers and mining periodicals.

This information results from the compilation of returns which mine and quarry operators send in to the division, on regular forms which the division sends out regularly with a request to fill them in.

Except for certain special enquiries which strictly concern our Department of Mines only, our Statistics division works in collaboration with the Dominion Bureau of Statistics. In order to reduce the number of returns that operators of mines and quarries must send in to both federal and provincial governments, the Quebec Department of Mines has an understanding with the federal Bureau of Statistics which permits to use the same statistical returns. The Federal authorities see to the printing of the forms to fill in. Our division has charge of expediting at opportune time, these forms to the operators in the province of Quebec and to see that they are duly filled up, in duplicate. After we have examined them, and had them completed or corrected when necessary we forward one of the two copies to Ottawa. The contents of these returns are compiled at Quebec and at Ottawa, and the final results are compared.

The following table indicates the different forms which this division has had to handle in the course of the calendar year 1949.

	<u>Returns received</u>
Forms regarding mining production and operators:	
Annual returns .....	2,698
Monthly returns .....	689
Annual reports from building contractors .....	137
Annual reports of mine timber and lumber used .....	74
Annual reports of funds received by mining companies for capital account .....	670
	<hr/> 4,268

Of the 2,698 annual returns received regarding mineral production and mining operations, 1,302 came from mines and quarries in production, or which made some shipments of mineral product; 234

were from mining properties not yet producing, but on which exploration work or development work was effected during the year and 1,162 mention having been inactive the whole year.

The returns concerning funds for capital account serve to determine the net amounts received by the mining companies from three main sources: sale of common shares, sale of bonds and debentures, or other securities, and long term loans. The returns received from these sources, in 1949, by mining companies operating in the province of Quebec totalled \$17,400,000. A like enquiry made for the year 1948 gave a total of \$14,500,000. The purpose of this enquiry is to obtain some idea of what funds are annually available for the exploration and development of mining properties in the province of Quebec.

New Mining Companies

(Compiled by Division of Mineral Statistics)

The number of mining companies organized in the calendar year 1949 was less than in the preceding year 1948.

In the course of that period 30 companies incorporated by Quebec charters. In addition, 13 companies with Ontario charters and 1 company with a federal charter have acquired mining rights in the province of Quebec. Therefore 44 new mining companies were organized in 1949, to operate in the Province. In 1948 the number had been 58 new mining companies incorporated, of which 37 had a Quebec charter, 16 an Ontario charter and 5 a Federal charter.

Mining Companies Incorporated by Quebec Charters in 1949

Company	Head Office	Date of Incorporation	Number of Shares	Par Value
Asbestosore Development Ltd. ....	Montreal	Dec. 28th	10,000	\$ 1
Ascot Metals Corporation Ltd. ....	Sherbrooke	Feb. 14th	3,500,000	1
Beryllium Corp. of Canada Ltd. ...	Val d'Or	July 2nd	4,500,000	1
Bolgo Gold Mines, Ltd. ....	Montreal	Dec. 21st	3,500,000	1
Burge Lake Goldfields Ltd. ....	Val d'Or	Apr. 27th	3,500,000	1
Canadian Rock Co. Ltd. ....	Noranda	May 16th	400	100
Cie d'Amiante Continentale Ltée ) (La) .....	Thetford Mines	May 10th	3,500,000	1
Continental Asbestos Co., Ltd. ) Cie de Sable et de Gravier				
Montmorency, Ltée (La) .....	Quebec	Dec. 12th	800	50
Coleraine Quebec Asbestos, Ltd. ..	Montreal	Feb. 14th	3,500,000	1

Mining Companies Incorporated by Quebec Charters in 1949 (Cont'd)

Company	Head Office	Date of Incorporation	Number of Shares	Par Value
Compagnie de Marbre Carrare ) Canadien (Limitée) ..... ) (Canadian Carrara Marble ) Company, Ltd.)	Montreal	April 4th	2,000	\$ 10
Compagnie Minière Lac Noir Ltée(La)	Montreal	Dec. 17th	10,000	1
Defor Chibougamau Mines Ltd. ....	Montreal	March 16th	3,000,000	1
Delbo Inc. ....	Stukely Nord	March 9th	(a) 5,000 250,000	50 1
Dominion Lime Limited .....	Montreal	Dec. 22nd	(a) 1,000 (a)10,000 10,000	100 50 None
Harrison Drilling and Exploration Co. Ltd. ....	Noranda	Dec. 15th	800	50
Kimball Mining Corporation .....	Knowlton	Oct. 14th	200,000	1
Loujac Exploration Company Ltd. ...	Montreal	March 5th	40,000	1
Lynthurst Mining Co. Ltd. ....	Montreal	Oct. 21st	3,000,000	1
Nicupt Mines Limited .....	Montreal	May 30th	4,000,000	1
Nocana Mines Limited .....	Montreal	Aug. 9th	3,000,000	1
Nor-East Mining Exploration Ltd. ..	Montreal	Feb. 1st	3,000,000	1
North Sullivan Contact Mines Ltd. .	Montreal	Dec. 15th	3,000,000	1
Notre-Dame Quarries Co. Ltd. ....	Notre-Dame du Bon- Conseil	July 26th	(a) 250 250	100 100
Premier Peat Moss Producers Ltd. ..	Rivière- du-Loup	May 19th	(a) 2,000 20,000	100 10
Quebec Uranium Corporation .....	Montreal	Aug. 4th	3,000,000	1
Radac Health Resort Inc. ....	Montreal	Aug. 24th	(a) 5,000 500,000	100 1
St.Bruno Quarry and Paving Co. Inc.	Montreal	March 23rd	(a) 350 250	100 None
St.Lawrence Asbestos Co. Ltd. ) (La Cie d'Amiante St-Laurent ) Itée) .....	St-Odilon Beauce Co.	Jan. 26th	3,000,000	1
Sanctae Rosaelis Mining Corp. ....	Val d'Or	Jan. 20th	5,500,000	1
Silver Sand Company Limited .....	Montreal	Nov. 29th	500	100
(Silver Sand Compagnie Itée)				

(a) Preferred shares.

Mining Companies Incorporated by Ontario Charters in 1949  
Holderes of Mining Rights in Quebec

Company	Head Office	Date of Incorporation	Number of Shares	Par Value
Alana Mines Limited .....	Toronto	Aug. 17th	4,000,000	\$ 1
Antoinette Lake Mines Ltd. ....	Toronto	Nov. 21st	3,500,000	1
Belle-Chibougamau Mines Ltd. ....	Toronto	March 16th	3,000,000	1
Cantley Mining Company Ltd. ....	Kingston	June 11th	15,000	None
Consolidated Harpers Malartic				
Gold Mines Limited .....	Toronto	July 4th	3,500,000	1
Industrial Phosphate Mines Limited.	Toronto	Dec. 20th	3,000,000	1
Lecopa Mines Limited .....	Toronto	Nov. 21st	3,500,000	1
Marvel Rouyn Mines Limited .....	Toronto	March 21st	3,500,000	1
Ontigan Explorations Limited .....	Toronto	Jan. 25th	500,000	1
Quetide Mining Company Ltd. ....	Toronto	Jan. 29th	3,500,000	None
Richglen Mines Limited .....,.....	Toronto	Nov. 23rd	3,500,000	1
South State Uranium Mines Limited .	Toronto	Sept.15th	3,500,000	1
Treasure Rouyn Mines Limited .....	Toronto	May 31st	5,000,000	1

Mining Companies Incorporated by Federal Charters in  
1949, Holderes of Mining Rights in Quebec

Company	Head Office	Date of Incorporation	Number of Shares	Par Value
Gravimetric Surveys Ltd. ....	Kazabazua	July 13th	50,000	None

DIVISION OF EDITING AND PRINTING OF PUBLICATIONS

Maurice Brunet, as editor in charge of this division, submits the following report on the work carried out during the fiscal year ending March 31st, 1950:-

List of the Publications of the Department of Mines edited during the fiscal year ended March 31st, 1950.

- The Mineral Industry of the Province of Quebec in 1948
- Geological Report No. 20 - The Geology of Quebec, Vol.III, (Economic Geology), John A. Dresser and T.C. Denis.
- Geological Report No. 39 - Geological Reconnaissance of Peribonca River, from Passe Dangereuse to Onistagan Lake, S.H. Ross.

- Geological Report No. 40 - Taibi Lake Area, René Béland.  
Geological Report No. 41 - Razilly Map Area, O.D. Maurice.  
Geological Report No. 42 - Part I - North Shore of the St-Lawrence,  
from Mingan to Aguanish, W.W. Longley.  
Part II - Limestone Deposits of the  
Mingan Islands, G.W. Waddington.  
Geological Report No. 43 - North Shore of the St-Lawrence, from  
Aguanish to Washicoutai Bay, J. Claveau.  
Geological Report No. 44 - Cawatose Area, William-G. Wahl and  
F. Fitz Osborne.  
Preliminary Report No. 227 - Mining Properties and Development  
in Abitibi and Témiscamingue Counties  
during 1946 and 1947, W.N. Ingham,  
W.G. Robinson and S.H. Ross.  
Preliminary Report No. 228 - Parts of Duvernoy and Landrienne  
townships, W.W. Weber.  
Preliminary Report No. 229 - General Report of the Minister of  
Mines of the Province of Quebec for  
the fiscal year ending March 31st, 1949.  
Preliminary Report No. 230 - The Lac La Trève Area, J.E. Gilbert.  
Preliminary Report No. 231 - The Maicasagi Area, P. E. Imbault.  
Preliminary Report No. 232 - Part of the West Half of Hebecourt  
Township, R. Bruce Graham.  
Preliminary Report No. 233 - Waswanipi Lake Area (East Half).  
D.A.W. Blake.  
Preliminary Report No. 234 - A Chemical Study of the Peats of  
Quebec, J. Risi, C.E. Brunette,  
D. Spence and H. Girard.  
Preliminary Report No. 235 - The Denholm-Hincks Area, Pierre  
Mauffette.  
Preliminary Report No. 236 - The Mazarin Area, Marcel Tiphane.  
Preliminary Report No. 237 - The Grondines Area, T.H. Clark,  
(Part I), M. Lunde (Part II).  
Preliminary Report No. 238 - Témiscamie Mountains Area, J.M.  
Neilson.  
Preliminary Report No. 239 - A Technique for the determination  
of epigenetic base metals in Rocks,  
J.E. Riddell.  
Preliminary Report No. 240 - Beetz Lake Area, Paul-E. Grenier.  
Preliminary Report No. 241 - Northeast Quarter of Duprat Town-  
ship, R.L. L'Espérance.  
Preliminary Report No. 242 - Montauban-les-Mines Area, J.R. Smith.  
Preliminary Report No. 243 - Southwest Part of Lesueur Township,  
R.B. Graham.  
Preliminary Report No. 244 - The Sagard-Callières Area, S.H. Ross.  
Preliminary Report No. 245 - The Belleterre Area (Sheet No. 4),  
P.F. Auger.



PUBLICITY AND INFORMATION

(Jean-Paul Drolet, Mining Eng.)

In order to keep the public informed on the progress of the development of the mineral resources of the Province and of its mining industry, the officers of the Department of Mines prepare lectures, talks, communiqués and news-letters, which are delivered at meetings of scientific and technical societies and others. Numerous articles are also written for technical periodicals, mining newspapers as well as for the daily press. The numerous official publications of the Department of Mines on geology and the mining industry keep the interested public well informed on the progress achieved from year to year.

In the course of the fiscal year 1949-50 the main activities in that field have been as follows:

By the Hon. C.D. French, Minister of Mines

"Les progrès de l'Industrie minière" article published in the daily newspaper "Le Canada", May, 1949.

"The Mineral Industry of the Province of Quebec" talk at a meeting of the Advertising and Sales Executive Club of Montreal, October, 1949.

"The Mining Industry and its relation to other industries", lecture delivered at a meeting of the Rotary Club at Trois-Rivières.

"The Mining Industry of the Province of Quebec reports an active year" article published in "The Northern Miner" - October, 1949.

"All-time record in 1949 for Quebec Mining" published in the Special Annual number of "The Northern Miner", November, 1949.

"Mining Industry of Quebec, with regard to the Ceramic Trade and Provincial Government assistance" lecture read at annual meeting of the Canadian Ceramic Society, Montreal, November, 1949.

"Review of the Mineral Industry of the Province of Quebec in 1949", article published in "The Val d'Or Star", March, 1950.

"La colonisation et l'exploitation des mines, facteurs conjoints du développement de l'Ouest du Québec", article published in the special number of "L'Echo Abitibien", March, 1950.

"Quebec, its Mining Progress" article published in the "Quebec Miner" on the occasion of the Annual Meeting of the Prospectors' and Developers' Association, March, 1950.

By A. O. Dufresne, Deputy Minister of Mines

"L'Industrie minière de la province de Québec, son état actuel et ses progrès à venir" article published in "La Patrie", April, 1949.

- "Mining in Quebec holds promise for future", article published in the review "Monetary Times", October, 1949.
- "The Progressive Mineral Industry of the Province of Quebec" article published in the special annual number of "The Gazette", Montreal, January, 1950.
- "Les mines de fer de Grande Bretagne, de France, et de Suède" lecture delivered at the Science Faculty of Laval University, Feb. 2nd, 1950.
- "Quebec Mineral Production on the Increase" article published in the newspaper "The Western Miner", March, 1950.
- "The Modern Prospector" lecture delivered at the meeting of the Prospectors' and Developers' Association at Toronto, March 6th, 1950.

By I.W. Jones, Chief of Geological Surveys Branch

- "The Appalachian Region", discussion of "Structural Geology of Canadian Ore Deposits", read at the Annual Meeting of Canadian Institute of Mining and Metallurgy, April, 1949, and published in the "C.I.M. and M. Bulletin" of February, 1950.
- "Growth and Importance of the Quebec Mining Industry" article published in the review Educational Record, Volume LXVI No.2, Jan. and Feb., 1950.
- "Les Roches de Percé", article prepared for the second edition of a volume on Percé, by Rev. Abbé C.-E. Roy.

By B.T. Denis, Chief of Mineral Deposits Branch

- "Quebec's Undeveloped Mineral Resources", lecture delivered at the annual meeting of the Engineering Institute of Canada in Quebec city, May 12th, 1949, and published in the "Engineering Journal" of November, 1949.

By Jean-Paul Drolet, Chief of the Technical Information Division

- "Considérations économiques sur le Minerai de Fer du Nouveau Québec et l'Ilménite du lac Allard" lecture delivered at the meeting of the Kiwanis Club, Château Frontenac, April 21st, 1949.
- "Coup d'oeil sur les perspectives de notre industrie minérale", article published in the "Journal du Jeune Commerce", April, 1949, Vol.III, No. 10.
- "Le fer titané de la Côte Nord et son Traitement métallurgique", lecture delivered at the Exposition Industrielle de Sorel, May, 1949.
- "Notes historiques sur l'exploitation des minéraux dans la Province de Québec", article published in the "Journal du Jeune Commerce", June, 1949, Vol. III, No. 12.

"Economic Mineral Resources of the Province of Quebec, with special reference to the new developments of Ungava and Allard Lake region", illustrated lecture given to the members of the Engineering Institute of Canada at Arvida, November 29th, 1949.

"Les Placements et la Spéculation dans l'industrie minière" lecture at Château Frontenac to Lions Club, Quebec, February 6th, 1950.

"Organisation et Financement des entreprises minières" lecture delivered at the Science Faculty of Université Laval, March 25th, 1950.

"Géographie Economique et l'Industrie Canadienne" lecture delivered at Quebec Seminary, March 27th, 1950.

"L'industrie minière de la Province de Québec" article prepared for Atlas of Canada, published by the Federal Government, March, 1950.

By René Béland, Geologist

"Geologie de la région de Rawdon" lecture delivered at the annual meeting of Association Canadienne Française Avancement des Sciences (ACFAS), October, 1949.

By Roland DeBlois, Geologist

"Pétrographie et Métamorphisme des roches de la Série des Monts Shickshock", paper read at the Annual meeting of Association Canadienne Française Avancement des Sciences (ACFAS), Oct., 1949.

By J.E. Gilbert, Geologist

"Etude sur le métamorphisme des roches basiques de la région des Capisisit et Inconnu" paper read at the annual meeting of Association Canadienne Française Avancement des Sciences (ACFAS), Oct. 1949.

"Capisisit Lake and Eastward", general geology, structure and mineral possibilities, paper read at the Annual meeting of the Prospectors' and Developers' Association, Toronto, published in the Canadian Mining Journal, May, 1950.

By P.E. Grenier, Geologist

"Problèmes géologiques au lac Albanel, Territoire de Mistassini", lecture delivered at the annual meeting of the Association Canadienne Française Avancement des Sciences (ACFAS), Oct., 1949.

By P.E. Imbault, Geologist

"The Mattagami-Capisisit Region, Northern Abitibi", paper read at the Annual meeting of Prospectors' and Developers' Association, Toronto, published in Canadian Mining Journal, June, 1950.

By P. Maufette, Geologist

"Notes sur la découverte de Sédiments Fossilifères de la mer Champlain dans les régions de Val des Bois, de Martindale, et de Farrelton", paper read at the meeting of Association Canadienne Française Avancement des Sciences (ACFAS), Oct., 1949.

By S.J. Melihercsik, Geologist

"Foliation and schistosity", lecture delivered at the Association Canadienne Française Avancement des Sciences (ACFAS), Oct. 1949.

By F.F. Osborne, Geologist

"Coronite, labradorite, anorthosite and Dykes of Andesine Anorthosite, New-Glasgow, P.Q.", paper read at the Annual meeting of the Royal Society of Canada, June, 1949, and published in the Transactions Royal Soc. of Canada, Vol. XLIII, Section IV, 1949.

"The Southern Precambrian of Quebec - mineral deposits from Calumet Island to Allard Lake" read at Annual meeting of Prospectors' and Developers' Association, Toronto, March, 1950.

By W.N. Ingham, Resident Geologist, Val d'Or

"Geology and Structure of the Malartic Area", paper presented at the annual meeting of Prospectors' and Developers' Association, Toronto, March, 1950.

"Monthly Correspondence", a series of six articles of the mining activities in Val d'Or region, presented in the monthly Bulletins of the Canadian Institute of Mining and Metallurgy.

By W.G. Robinson, Resident Geologist, Rouyn

"Monthly Correspondence", a series of six articles on the Rouyn-Noranda region, on the mining activities in the district, published in the monthly Bulletins of the Canadian Institute of Mining and Metallurgy.

By R.B. Graham, Geologist

"Geology of the S.W. quarter of Lesueur township, Bachelor Lake district", paper presented at the Annual meeting of Prospectors' and Developers' Association, Toronto, March, 1950.

By L.A. Saint-Pierre, Chief of Civil Engineering Branch

"Construction du chemin de Chibougamau", an article published in the "Chibougamau Miner", January, 1950.

By J.P. Girault, Mineralogist

"Etude des constituants minéralogiques des minerais de fer du Nouveau-Québec", lecture presented at the annual meeting of the Association Canadienne Française pour Avancement des Sciences (ACFAS), Oct. 1949.

"Fantaisie sur le Pendule" paper presented at a meeting of the Société du Flambeau, Trois-Rivières, Feb. 1950.

"Le fer au Québec, naissance d'une industrie" article published in "L'Action Catholique", Québec, August 18th, 1949.

By Fernand Claisse, Physicist and J.P. Girault, Mineralogist

"Identification des plagioclases par diffraction des rayons-X", lecture presented at the annual meeting of the Association Canadienne Française pour Avancement des Sciences (ACFAS), October, 1949.

By B. Nolin, Physicist

"Spectromètre à Flamme" paper read at the Annual meeting of the Association Canadienne Française pour Avancement des Sciences (ACFAS), October, 1949.

By J. Risi, C.E. Brunette, Dorothy Spence

"A Chemical Study of the Peats of Quebec; composition of the "Claire" bog (Bellechasse), and of the "Iac-à-la-Tortue" bog (Laviolette)" paper presented at the annual meeting of Association Canadienne Française pour Avancement des Sciences (ACFAS), October, 1949.

By Constance Tousignant, Physicist

"Etude Spectrographique des Pyrites" paper read at the Annual meeting of the Association Canadienne Française pour Avancement des Sciences, October, 1949.

By Paul Bourret, Mining Engineer

"The Mining Industry of Quebec with regard to the Ceramic Trade" lecture presented at the Annual convention of the Canadian Ceramic Society, Montreal, November, 1949.

COLLECTION OF DUES ON MINES

S. Drouin, in charge of this division, submits the following report:

During the fiscal year 1949-50, the Department of Mines received sworn statements of production from 31 operators of mines in the province of Quebec. The mining law provides that these returns be accompanied by vouchers presenting the data required by the Quebec Mining Act (Div. III, Sec. 12 to 24). From this source the Department of Mines collected a sum of \$2,410,749.70<sup>x</sup>, on the annual net profits of the mines, as defined by the law.

In addition to the above dues, there is an acreage tax of 10 cents per acre due by holders of mining concessions who have not carried out mining or development work on their idle mining lands during the year (Quebec Mining Act. Div. VIII, sec. 30). In connection with this provision of the law, we received returns from 201 owners of such improductive properties. A sum of \$2,779.06 was collected from 86 holders of such dormant properties. The other 115 holders of non-productive properties sent in sworn statements that at least two hundred dollars (\$200) had been spent in development work on their concessions during the year. This is a statutory condition for the remittal of the acreage tax above mentioned.

Table XI.- Comparative Statement of Revenue Collected by the Department of Mines During the Fiscal Years 1947-48; 1948-49; 1949-50  
(Prepared by Robert Samson, Chief Accountant)

	1947-1948	1948-1949	1949-1950
Miner's certificates .....	\$ 51,870.00	\$ 44,655.00	\$ 45,811.00
Development licenses .....	500,576.43	409,217.64	384,674.36
Penalties .....	1,797.50	350.00	150.00
Sales of mining concessions.	23,631.62	9,042.60	18,050.70
Fees for transfers of titles	14,482.00	14,310.00	11,150.00
Acreage tax on mining concessions .....	2,342.67	2,206.66	2,660.06
Dues on townsite lots .....	---	579.00	839.00
Dues on profits of mines ...	1,007,375.40	1,375,721.55	2,264,313.85
Permits of sales of unwrought metals .....	12.00	12.00	18.00
Sales of maps, blue prints, etc. ....	2,622.75	2,812.80	2,684.75
Sales of mineral collections	687.25	864.55	607.55
Fees for assays and analyses	947.50	1,157.25	2,621.75
Sampling Plant (Rent and sundries) .....	343.34		
Miscellaneous .....	2,283.90	2,805.24	6,324.44
Casual revenue .....	265.99	179.68	7,958.02
	\$1,628,198.81	\$1,874,527.27	\$2,752,078.67

<sup>x</sup>Dues on annual profits of Mines - There is a difference between the amount of this item as given by the assessor's office, and the amount given by the accountant's office. This divergence is due to the fact that a part of "deferred revenue", on the date of March 31st, 1950, was carried to the fiscal year 1950-51.

THE LIBRARY

The accessions to the library in the year 1949 increased the entries by 560 units, distributed as follows: 173 volumes, 285 reports and 102 various booklets and brochures comprising memorandums, bulletins and manuscripts.

The books bought during the year number 65 volumes, treating of diverse subjects mainly dealing with mining and metallurgy, and their related sciences: geology, mineralogy, physics and chemistry.

The library receives also numerous volumes of reports through exchanges of publications with Departments of Mines of the Federal and Provincial governments in Canada, and also from the United States and some of the South American countries, as well as the French and the British governments.

The library subscribes to some 150 technical periodicals, mining journals, mining newspapers and other publications dealing with mining and metallurgy, and their related sciences.

The main object of the library is as an aid for the personnel of the Department of Mines, and it proves to be a very useful source of reference, judging from the numerous requests from the staff for registered loans of books, and countless searches pursued in the library itself, for information on these subjects.

The public interested in these subjects is welcome to make use of the library, and the technical staff is eager to be of help in finding the information sought for. The number of such visitors is of the order of three hundred to four hundred a year.

The librarian has begun a reclassification of the volumes according to the Dewey system. This work, of long labour, will give the library a modern and universal system of classification.

The library suffers greatly from the lack of shelf-space, which is a serious obstacle to a good organization.

SCHOLARSHIPS OF THE DEPARTMENT OF MINES

In accordance with its policy of encouraging young men to adopt a career related to the mineral industry, the Quebec Department of Mines, in fiscal year 1949-50, granted thirty-five scholarships to promising students of the Province taking university courses in mining, geology and metallurgy.

The Quebec Legislature had voted a sum of \$20,000 for this purpose. Following the procedure of past years, the Minister of Mines had commissioned a committee composed of representatives from universities and from the Provincial Department of Mines, to study the applications of the candidates to these scholarships, and to recommend those who seemed to be the most worthy of the award of the scholarships offered.

This committee of recommendation of awards for the year 1949-50 was composed of the following: B.T. Denis, chief of the Division of Mineral Deposits of the Provincial Department of Mines, as chairman in the absence of the Deputy-Minister; J.U. MacEwan, professor of Metallurgy at McGill University; Ignace Brouillet, director of l'Ecole Polytechnique of the Université de Montreal; Abbé J.W. Laverdière, director of the geological department of Université Laval of Quebec; Louis Cloutier, assistant-secretary of the Science Faculty of Université Laval; I.W. Jones, chief of the Geological Surveys Branch of the Department of Mines, and Gisèle Landreville, secretary of the committee.

The main object of these scholarships being to help brilliant university graduates to carry on advanced studies, the committee, to begin with, considered the applications of holders of diplomas, wishing to obtain a Master of Science degree or a Doctorate; then next came the applications of holders of scholarships of the preceding year, wishing to carry on to further advanced studies who fulfilled all the requirements for a renewal; and last were considered the applications of students entering the final year of a university course in mining, geology or metallurgy engineering.

The thirty-five scholarships available in 1949-50 were awarded as follows:

Candidates to post-graduate courses .....	17
Students entering final year in science faculties .....	8
Students in less advanced years .....	<u>10</u>
Total .....	35

The committee notes with great satisfaction the increasing number of the Department's scholarship graduates who elect to carry on their post-graduate studies leading to the Master's degree and the Doctorate. From two such candidates in 1946-47, and 1947-48, the number increased to twelve in 1948-49, and to seventeen in 1949-50.



This aid, having in view the adequate preparation of competent men to develop our mineral industry, is more and more appreciated, and it is a matter of great satisfaction to observe the increasing number of candidates to post-graduate studies in mining, geology, metallurgy and other sciences related to the mineral industry.

---