DP184

"Annotated list of occurences of Industrial Minerals and Building Materials in Quebec"

by : Dr. O.D. Maurice

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APATITE

Phosphate mining in the province of Quebec was one an important item of the mining industry. In the seventeen years between 1878 and 1894, the production of apatite in the province amounted to 282,555 tons valued at $4,103,008. From 1890 the activity decreased considerably due to the development of the phosphate deposits of Florida which caused the prices for the minerals to full below the value which made mining in Canada competitive. Many of the phosphate mines also contained mica and so continued to be active for some time after the phosphate operations ceased. There was a slight pick up of activity during the first world war and an important renewal during the second world war especially in 1941 when 2487 tons of phosphate was mined valued at $33,376. This output was sold in great part to the Electric Reduction Co. at Buckingham to be used in the manufacture of phosphorous and phosphorous salts.

The list of apatite occurences which follows may not have more than a historical interest unless a shortage of phosphate developed or some economic way was found to separate the mineral from its gangue.

Principle References

(1) J. Obalski, Mines and Minerals of Quebec, 1889-1890.

(2) J. Obalski, Mica dans la province de Québec, Qué. Dept. de la Colonisation et des Mines, 1901.

(3) R.W. Ells, Bulletin on Apatite, C.G.S. publ. no. 881, 32pp., 1904.

(4) H.S. Spence, Phosphate in Canada, Can. Mines Br., publ. 396, 156 pp., 1920.

(5) W.W. Moorhouse, Apatite belt of West Portland Township, Quebec. Que. Dept. Min., P.R. 178, 17pp., 1943.

LIST OF OCCURRENCES

ALLEYN Township, Pontiac County.

Range II, lot 4.

Ref.: 2, p. 56.

A little phosphate associated with mica in pyroxene vein.

BERGERONNES Township, Saguenay County.

Bloc B.

Ref.: 2, p.22; also E.M. Greig, Que. Dept. of Mines, G.R. 32, 1952, p. 11.

Small quantities of apatite associated with mica.

BIGELOW Township, Papineau County.

Range I, lots 1, 7, 8. Range II, lot 33. Range III, lots 36, 40, 49. Range IV, lots 5, 6, 51 to 54. Range VI, lots 5, 6, 7, 9, 10.

Ref.: 1, p. 136.

Localities mentioned.

BOUCHETTE township, Gatineau County.

Range IV, lot 7. Range X, lot 24.

Ref.: 2, p.54.

Phosphate associated with mica.

BOURGET Township, Jonquière-Kenogami County.

Range I, lots 44, 45.

Ref.: Office records.

St. Charles Titaniferous-magnetite deposit contains phosphorous in percentages varying from 1 to 4 associated with the titaniferous iron ore.

BOUTHILLIER Township, Labelle County.

Range IV, lot 22.

Ref.: Que. Dept. Mines, G.R. no. 23, p.46.

Apatite in small cristals in cristalline limestone as accessory mineral in pyroxenite.

BOWMAN Township, Papineau County.

Range I, lots 42 to 46, 52, 53, 56. Range II, lots 25 to 28, 31, 32, 33, 39, 41 to 46. Range III, lots 17, 18, 32 to 36. Range IV, lots 5, 6, 9 to 14. Range V, lots 4, 6, 8, 10, 12, 15, 16, 17, 26, 29 to 31. Range VI, lots 5, 6, 13, 14, 15, 30, 31, 32. Range VII, lots 21 to 28, 42, 43, 44, 57.

Ref.: 1, p. 132 and 135.

Localities mentioned.

Range IV, lots 1 to 4.

Ref.: 1, p. 135; 4, p.60; 3, p.20.

High Falls Mine, operated in 1890 by General Phosphate Corporation of London. Total production estimated at 1,000 tons. Mineral massive and compact occuring in pockets in a light, grey-green pyroxene.

Range V, lots 27, 28.

Ref.: 1, p. 135; 4, p. 61; also Que. Dept. Mines, Mining Industry 1945, p. 42; 1946, p. 37; 1947, p. 48 and P.R. 223, p.9, 1949.

The Brazeau Mine operated between 1907 and 1910 by Messrs. Watts and Noble. Estimated production, 1500 tons. From 1942 to 1946, Robert Bigelow sold 1733 tons valued at $24,078. The apatite occurs in an east-west lens with steep dips varying in width from a few inches to more than 20 feet. The country rock is pyroxenite.

BRASSARD Township, Berthier County.

Range C, lot 16.

Ref.: 1, p. 135.

Locality mentioned.

BUCKINGHAM Township, Papineau County.

Range VI, lot 5B.

Ref.: Que. Dept. of Mines, P.R. 330, p.17, and office records.

Property known as the Doherty property explored in 1960 by Luckridge Phosphate Mines Ltd. Crystalline limestone with high percentage of magnesia containing small percentage of phosphorous.

Range VII, lots 19, 21. Range IX, lots 17, 20. Range X, lots 26 to 28. Range XI, lots 18, 20 to 24, 27, 28. Range XII, lots 28.

Ref.: 1, p. 135.

Localities mentioned.

Range X, lot 25.

Ref.: 4, p. 62; 1, p.135.

Locality mentioned, no production.

Range XI, lot 19.

Ref.: 3, p. 14; 1, p. 126; 4, p. 62.

Washington or Lansdown mine. Mine opened in 1876 by G.C. Brown, worked in 1882 by Dominion Phosphate Co. No large bodies discovered.

Range XI, lots 25 S½, 26.

Ref.: 4, p. 62; 1, p. 135.

Kendall mine; 100 tons mined around 1880.

Range XII, lot 17 N½.

Ref.: 1, p. 129; 3, p. 23; 4, p.63.

Aetna Mine; worked from 1875 to 1893 first by The Buckingham Mining Company, then by Anglo-Continental Guano Company Ltd., and by British Phosphate Company. Apatite frequently occurs at the intersection of later dykes with pyroxene.

Range XII, lot 18 S½.

Ref.: 1, p. 129; 3, p. 23; 4, p.63; also Min. Industry of the Prov. of Quebec 1942, p. 37.

Squaw Hill or Grant Mine; first worked around 1876 by Dr. J.A. Grant of Ottawa. 3,000 tons mined around 1889 by the Anglo Continental Guano Company. Large quantities mined in 1892 by the British Phosphate Company. The mine was acquired in 1942 by J.K. Crang Corp. of Toronto who worked it during the war years.

Range XII, lot 19.

Ref.: 1, p. 126; 3, p. 23; 4, p.64. Also Guide Book, no. 3, Int. Geol. Congress, pp. 89-93, 1913.

Emerald Mine; first worked by the Buckingham Mining Co. around 1875 then by Messrs Murray and Allan and by the Ottawa Phosphate Mining Co. until 1892. The mine is said to have produced 5,000 tons of phosphate per year in the middle eighties or a total of 35,000 tons up to 1889. One vein of massive phosphate 90 feet wide is said to have been mined. The mine was operated during the second world war by Commercial Mineral Products Co. of Montreal.

Range XII, lot 26.

Ref.: 4, p. 65.

The Vennor lot; worked in a small way in the early eighties.

Range XII, lot 27.

Ref.: 4, p.65.

Exploration in early seventies and in 1875 by the Buckingham Mining Co.

CAMPBELL Township, Labelle County.

Range I, lot 19

Ref.: Que. Dept. of Mines, G.R. 23, p.46.

Small crystals associated with phlogopite.

CHATHAM Township, Argenteuil County.

Range IV, lot 28.

Ref.: 2, p. 59.

Explored in 1892. Phosphate associated with little mica.

DE MAINSONNEUVE Township, Berthier County.

Range IV, lot 11.

Ref.: 1, p. 135.

Locality mentioned.

DENHOLM Township, Gatineau County.

Range I, lots 2 to 7. Range V, lot 8. Range VII, lot 4. Range VIII lots 4, 6, 8, 9, 10 to 26.

Ref.: 1, p. 136.

Localities mentioned.

DERRY Township, Papineau County.

Range I, lots 1, 5, 9, 10. Range II, lots 4, 5, 9, 10, 28. Range III, lots 1 to 4, 6. Range IV, lots 1, 2, 5, 6. Range V, lots 1, 2. Range VI, lots 1, 2.

Ref.: 1, p. 136.

Localities mentioned.

Range II, lots 2, 3.

Ref.: 1, p. 134; 4, p. 65.

Production in the eighties by the Du Lievre Milling and Manufacturing Co. and later by the Du Lievre Phosphate Mills. The mill operated by Mr. Shirley had a capacity of 25 tons per day. Small bodies of apatite mixed with mica and calcite.

Range VI, lots 8 and 9.

Ref.: 4, p. 67.

Worked for a few months in 1910 by Mr. John Gorman who mined about 30 tons of phosphate and sold the output to the Electric Reduction Co. Phosphate lens about 5 feet wide at contact with granite dike.

GRAND CALUMET Township, Pontiac County.

Range VIII, lots 30 to 33.

Ref.: 1, p. 137.

Localities mentioned.

GRENVILLE Township, Argenteuil County.

Range VII, lot 17 S½.

Ref.: 2, p. 58.

Old phosphate mine in which phlogopite, graphite and marble are present.

HINKS Township, Gatineau County.

Range IV, lots 6, 17, 18, 30, 31, 32, 37, 38. Range XIV, lots 12, 13.

Ref.: 1, p. 136; 2, p. 50.

Phosphate associated with mica.

HUDDERSFIELD Township, Pontiac County.

Range IV, lots 19, 20 N½. Range V, lots 19, 20 S½.

Ref.: Office Records.

Yates Uranium Mines; the allanite would contain 14.07% of P_2O_5 according to company reports.

HULL Township, Hull County.

Range VII, lots 18, 19.

Ref.: 3, p. 27.

Brown and Fortin Gravel Mines.

Range IX, lots 14, 15 N½.

Ref.: 1, p. 166; 2, p. 35; 4, p. 82.

The Scott Mine; opened around 1885 by Mr. Michael Scott. Few tons of phosphate mined and several tons of mica by Mr. M.G. Robertson in 1908.

Range IX, lot 15 S½.

Ref.: 4, p. 83.

Opened around 1890 by John Sweeney and also worked for mica by Kent Bros. Phosphate in small quantity associated with pink calcite and amber mica.

Range X, lot 4 S½.

Ref.: 4, p. 83.

Opened in 1875 by H. Darby and subsequently worked by Andrew Mayne and Messrs Gemmil and Nellis. Massive crystalline phosphate associated with phlogopite in pyroxenite.

Range X, lots 6, 7, 15, 17.

Ref.: 1, p. 136; 3, p. 27; 4, p. 89; also Min. Ind. of the Prov. of Quebec, 1944, p. 41.

Localities mentioned. Lot 17 is the Haycock Mine. Lot 15 is the Rainboth mine worked in 1944 by Victory Mines Ltd.

Range XI, lots 4, 5, 6 S½, 9 N½, 10.

Ref.: 1, p. 136; 4, p. 89.

Localities mentioned. Lot 9 N½ is Davis Mine. Lots 5, 6 S½ are Kearney Mine and lot 10 is Nellie and Blanche Mine.

Range XI, lot 11.

Ref.: 4, p. 83.

Featherstone Mine; worked first for phosphate by Thomas Featherstone and from 1907 to 1910 by T.F. Nellis for mica. Massive phosphate and crystals in calcite veins.

Range XII, lot 6, 9.

Ref.: 1, p. 135, 136; 4, p. 89.

Localities mentioned. Lot 9 is Prud'homme mine.

Range XII, lot 10.

Ref.: 1, p. 134; 3, p. 26, 27; 4, p. 85; 2, p. 38.

Gow, Gemmil, Nellis or Vasovour Mine, opened in 1878 by Donald Gow who is said to have produced about 3,000 tons of high grade apatite. The mine was worked for mica by various operators from 1884 until recently when it was operated by Blackburn Brothers who acquired the property in 1936. Numerous veins, striking north-east, having maximum width of 15 feet and an aggregate length of 2,100 feet are filled with calcite and crystals of apatite and phlogopite. The country rock is pyroxene.

Range XII, lot 14.

Ref.: 1, p. 134; 3, p. 27; 4, p. 86.

The Snow Mine; first worked around 1890 by Mr. Irish and subsequently by Mr. Snow and Messrs. Gemmil and Co. Total production not likely to have exceeded 200 tons mostly secured from one pocket.

Range XIII, lot 1 S½.

Ref.: 3, p. 27; 4, p. 86; 2, p. 39.

The Burke Mine; worked for phosphate and mica from 1894 when opened by J.W. Perkins. Mica and brown apatite disseminated through a mass of pink calcite in pyroxenite.

Range XIII, lot 10 N½.

Ref.: 4, p. 86.

McLelland Mine; opened in 1878 by Mr. Wilkinson who mined about 1,000 tons of phosphate. Acquired in 1911 by R. McConnell who worked the property for mica. Phosphate is in pink calcite associated with mica.

Range XIII, lot 12, 13.

Ref.: 1, p. 134; 4, p. 87.

About 300 tons of phosphate mined around 1885 by Messrs Gemmill & Company. In 1910, Webster and Company and Messrs Winning, Church and Co. worked the mine for mica.

Range XIV, lot 10 S½.

Ref.: 1 p. 135; 3, p. 27.

Locality mentioned. Webster Mine.

Range XIV, lot 13.

Ref.: Que. Dept. Mines, Mining Industry in 1946, p. 42.

Stanley Cross operated this mine in 1946 and shipped a few tons of phosphate.

Range XV, lots 12, 13, 16.

Ref.: 1, p. 136; 2, p. 39, 40; 3, p. 27; 4, p. 89.

Lot 12 N½ is Chubbock Mine opened by M. Dacey in 1898 and by Webster & Co. in 1899; mined especially for mica.

Lot 12 S½ is McAlister Mine.

Lot 13 S½ is Connor Mine worked in 1898 by Powell & Clemon especially for mica but also for phosphate. Worked also during the second world war by Henry Poirier.

Lot 16 N½ is McFarlane Mine worked in 1892, contains abundant phosphate but was worked especially for mica.

Range XVI, lot 12 S½.

Ref.: 1 p. 135; 2, p. 41; 4, p. 89.

Moore Mine worked in 1892, very small production especially of mica.

Range XVI, lot 13 S½.

Ref.: 3, p. 27; 4, p. 88.

Wilson Mine, opened in 1891 by Messrs J.R. Wilson and Neil Stewart; both phosphate and mica mined. Worked by J.H. Connor in 1905-1906 and by Wilson in 1907 and 1908. Total production about 1400 tons. One vein of apatite is said to be 8 feet wide.

Range XVI, lot 14 S½.

Ref.: 4, p. 88.

Property of Messrs Wilson and Stewart, worked on a small scale in early days and also in 1910 by M. Dubois.

Range XVI, lot 15 S½.

Ref.: 4, p. 89.

Cassidy Mine.

Range XVI, lot 16.

Ref.: 1, p. 136; 3, p. 26; 4, p. 88.

The Bowler Mine, worked in 1882; about 120 tons of phosphate are said to have been mined. Horseshoe Mine also on this lot.

LITCHFIELD Township, Pontiac County.

Range VI, lot 27. Range VII, lot 26.

Ref.: 1, p. 137.

Localities mentioned.

LOCHABER Township, Papineau County.

Range VII, lot 25 N½.

Ref.: 1, p. 136.

Locality mentioned.

LYTTON Township, Gatineau county.

Range V, lot 52.

Ref.: Que. Dept. Mines, G.R. No. 23, p. 46.

Very small crystal of apatite in cristalline limestone.

MANSFIELD Township, Pontiac County.

Range IV, lots 8, 9. Range VI, lots 19 to 23.

Ref.: 1, p. 137.

Localities mentioned.

McGILL Township, Papineau County.

Range IV, lots 1, 2.

Ref.: 1, p. 136.

Localities mentioned.

MONTAUBAN Township, Portneuf County.

Range I, lots 40, 41.

Ref.: Dept. Col. Mines, Fisheries, Quebec, Mining Oper. for 1915, p. 127.

Apatite in crystal up to two inches in length of rare occurence.

NORTHFIELD Township, Gatineau County.

Range A, lot 1.

Ref.: 2, p. 5.

Opened in 1895 by F. Desjardins and worked especially for mica in 1896 and 1898 by Toronto Mica Manufacturing Co. Phosphate associated with calcite and mica in pyroxenite.

PONTEFRACT Township, Pontiac county.

Range A, lots 14 to 18. Range IV, lots 1 to 7.

Ref.: 1, p. 137.

Localities mentioned.

PORTLAND Township, Papineau county.

Range IE, Lots 1, 2, 4, 5, 12, 13.

Ref.: 1, p. 136.

Localities mentioned.

Range IV, lots 2, 4, 25, 26, 27.

Ref.: 1, p. 136.

Localities mentioned.

Range IE, lot 3.

Ref.: 1, p. 136; 3, p. 14; 4, p. 67.

Fowler and Bacon Mine; small production reported in early eighties.

Range IE, lots 6, 7.

Ref.: 1, p. 128; 3, p. 14; 4, p. 67-69.

Little Rapids or Watts mine; opened around 1876 by the Buckingham Mining Company, acquired in 1883 by W.A. Allan who worked it until 1894 for phosphate. The mine was acquired in 1911 by M.J. O'Brien who worked it for mica and phosphate. Numerous indications of phosphate on these lots where more than 200 opening are said to be present.

Range IE, lot 8. Range IIE, lots 7, 8.

Ref.: 1, p. 129; 3, p. 14; 4, p. 70.

The London Mine opened in 1889 by Dominion Phosphate Co. Estimated production of 700 tons.

Range IIE, lots 1 to 6.

Ref.: 1, p. 136.

Localities mentioned.

Range IIW, lots 10, 19, 21, 22, 24, 25, 29, 30.

Ref.: 1, p. 136.

Localities mentioned.

Range IIIE, lots 1, 2.

Ref.: 1, p. 132; 4, p. 70.

Main workings of La Société Française des Phosphates du Canada who also owned a total of 4,795 acres in the townships of Portland and Templeton. Company operated from 1881 to 1883 producing about 2,000 tons of phosphate. Property was acquired in 1910 by M.J. O'Brien.

Range IIIE, lot 3.

Ref.: 4, p. 71.

Worked in 1911 by M.J. O'Brien.. The phosphate is associated with mica and scapolite largely altered to wilsonite.

Range IIIW, lots 5, 10, 11 to 14, 16, 25 to 28.

Ref.: 1, p. 136.

Localities mentioned.

Range IIIW, lots 14 S½, 15.

Ref.: 1, p. 136; 4, p. 75.

Massive apatite in pyroxenite, veins carry abundant scapolite. Very small production.

Range IIIW, lot 24 N½.

Ref.: 1, p. 136; 4, p. 76.

Mica is more abundant than phosphate.

Range IVE, lots 3 to 8, 20.

Ref.: 1, p. 136.

Localities mentioned.

Range IVE, lots 1 N½, 2 E½.

Ref.: 1, p. 133; 3, p. 15; 4, p. 71.

The Glasgow mine opened in 1884 by the Glasgow-Canadian Phosphate Co. and closed in 1886. Work was very limited on this property consisting of a few shallow pits.

Range IV W, lots 20, 25, 26, 32.

Ref.: 1, p. 136.

Localities mentioned.

Range IV W, lots 27, 28.

Ref.: 1, p. 128; 4, p. 76.

Fleming and Allan mine; operated extensively in 1889 and 1890 by Messrs Fleming and Allan. Phosphate usually red; some veins are as much as 20 feet wide. Mine was also operated for mica by H. McRae until 1893.

Range VE, lots 3, 11 to 14. Range V W, lots 17 to 19, 26, 35, 36.

Ref.: 1, p. 136.

Localities mentioned.

Range VI E, lots 1, 5, 7 to 14, 19 to 26.

Ref.: 1, p. 136.

Localities mentioned.

Range VI E, lot 2.

Ref.: 1, p. 136; 3, p. 15; 4, p. 71.

The Salette mine worked in 1891 by Hayes and Company. Very little work and no important deposit encountered.

Range VI, lots 15 to 18.

Ref.: 1, p. 136; 3, p. 15; 4, p. 72.

The Chapleau mine worked on a small scale in 1883 and 1884 by Chapleau and Co. especially on lot 17.

Range VI W, lots 1 to 4, 17, 18, 25, 26.

Ref.: 1, p. 136.

Localities mentioned.

Range VI W, lots 5, 6.

Ref.: 1, p. 136; 3, p. 17; 4, p. 76.

The Ross Mountain Mine discovered in early eighties and mined actively from 1890 to 1892 by General Phosphate Corp. Ltd. who produced 700 tons of phosphate.

Range VII E, lots 5, 6, 8 to 15, 19 to 28.

Ref.: 1, p. 136.

Localities mentioned.

Range VII E, lots 16, 17, 18.

Ref.: 1, p. 136; 3, p. 15; 4, pp. 72-74.

North Star or Haycock Mine, opened in 1879 by Mr. Haycock and sold to Dominion Phosphate Co. about 1882. An inclined shaft 620 feet deep has been sunk on the property; at one time the production reached 8000 tons on a yearly basis, the total mineral produced was in excess of 25,000 tons. A small tonnage of apatite was extracted from the mine during the second world war by the McLean Interests Limited of Montreal.

Range VII E, lot 24.

Ref.: 1, p. 136; 3, p. 15; 4, p. 74.

The Craft mine, worked on a small scale in the year 1880. Red and green phosphate in pockets.

Range VII W, lots 19, 20.

Ref.: 1, p. 136.

Localities mentioned.

Range VII W, lots 1, 2.

Ref.: 1, p. 126; 3, p. 15; 4, pp. 72-74.

Part of property of Ross Mountain mine.

Range VII W, lots 3, 4.

Ref.: 1, p. 126; 3, pp. 15-16; 4, pp. 77-78; office records.

Crown Hill or Little Union Mine opened in 1882 by the Union Phosphate Mining and Land Company and taken over in 1888 by the Canadian Phosphate Company Ltd. who operated the mine until 1892. The total production was in excess of 35,000 tons. In 1905, the property was bought by R. Ross and in 1907 by Mr. J.F. Higginson. During the second world war, the mine was operated by the Commercial Mineral Products Company of Montreal. Renewed interest in the property was provided by Quebec Smelting and Refining Co. who optioned this mine in 1948 together with other mines in the vicinity and conducted a very elaborate programme of exploration from 1949 to 1951. (See following).

Range VII W, lots 5, 6, 7, 8.

Ref.: 1, p. 124; 3, p. 19; 4, pp. 78-80; also Mining Industry of the Province of Quebec 1943, p. 59; 1944, p. 41; 1945, p. 42-43; office records.

High Rock mine, the most important and the most extensively developed of all canadian phosphate properties. Initial work done in 1879 by M. McFarland, property acquired in 1881 by the Phosphate of Lime Co. Ltd. who operated the mine until 1894; sporadic mining by various operators on a small scale until 1943 when High Rock Phosphates Limited took over the property to furnish war time demand. From 1949 to 1951, Quebec Smelting and Refining conducted an elaborate programme of exploration on the property, comprising one hundred diamond drill holes along a length of 4,200 feet and up to 1,200 feet in width. Phosphate was encountered in pratically all the holes but the drilling was not yet sufficient to provide an estimate of total tonnage reserves. (See Northern Miner, July 12th, 1951). At last report, the company now Consolidated Quebec Smelting and Refining still owns the property and is conducting tests using the Jones high intensity wet magnetic separator to separate the apatite from the gangue of pyroxene.

The main underground workings are an adit driven northward into Ross Mountain for 695 feet and five stopes ranging in length from 100 to 340 feet. Several extensive open pits have been worked in the past.

The ore consists of pockets and lenses of massive green or greyish-green apatite, irregularly distributed in pyroxenite. The dumps are said to contain about 50,000 tons of ore running 15 to 20% phosphate.

Range VIII E, lots 3, 6, 9 to 13, 18 to 25, 28 to 30.

Ref.: 1, p. 136.

Localities mentioned.

Range VIII E, lots 16, 17.

Ref.: 1, p. 136; 4, p. 74.

Part of property of the Compagnie Française des Phosphates du Canada who worked this property in the eighties; M.J. O'Brien acquired the property in 1910 and did a little work.

Range VIII E, lots 26, 27.

Ref.: 1, p. 136; 3, p. 15; 4, p. 75.

Lot 26 is the Philadelphia mine and lot 27 is the Cameron or McLaren mine. Production was not important.

Range VIII W, lots 5, 6, 10, 11, 13, 14, 20, 21.

Ref.: 1, p. 136.

Localities mentioned.

Range VIII W, lots 1, 2.

Ref.: 1, p. 136; 4, p. 78.

Part of property of High Rock Mines.

Range VIII W, lots 3, 4, 7, 8, 9.

Ref.: 1, p. 125; 3, p. 18; 4, p. 80-81.

Star Hill, Old Union Mine or Big Union Mine operated from 1882 to 1888 by the Union Phosphate Mining and Land Co. and by Canadian Phosphate Co. Ltd. from 1888 to 1892; constituted part of the property of Quebec Smelting and Refining Co. who did exploratory work from 1949 to 1951. The phosphate occurs in pockets associated with considerable feldspar and amber mica. Calcite and pyrites are absent.

Range VIII W, lots 5, 6.

Ref.: 1, p. 133; 3, p. 15; 4, p. 81.

The Chapleau mine operated in 1885 by Chapleau and Co.

Range IX E, lots 4, 5, 9, 16 to 22, 28 to 31.

Ref.: 1, p. 136.

Localities mentioned.

Range IX E, lot 27.

Ref.: 1, p. 136; 4, p. 75.

Worked during 1882 and 1883 by Mr. Bradley, little production.

Range IX W, lots 1 to 4, 10, 15, 17.

Ref.: 1, p. 136.

Localities mentioned.

Range IX W, lots 5, 6.

Ref.: 1, p. 136; 4, p. 81.

Worked in 1893 by W. McIntosh and in 1899-1900 by A. Cameron who extracted apatite as a by product of mica exploitation.

Range IX W, lots 7, 8, 9.

Ref.: 4, p. 80.

These lots and also lots 5 and 6 were originally part of Star Hill or Old Union Mine property. Work was mainly done on lot 7.

Range X E, lots 1 to 4, 27, 28.

Ref.: 1, p. 136.

Localities mentioned.

Range X W, lots 1 to 6, 11.

Ref.: 1, p. 136.

Localities mentioned.

Range X W, lots 7 to 10.

Ref.: 1, p. 128; 4, p. 82.

Central Lake mine, first worked in 1880 by Mr. McNoughton and taken over in 1887 by S.P. Franchot and Co. Many good indications from which 1,000 tons of phosphate were extracted in 1889. The work was mainly confined to lots 7 and 8.

RIPON Township, Papineau county.

Range VIII, lots 13, 14.

Ref.: Col. et Mines, Québec, 1899, p. 36.

Indication of phosphate in mica operations of Jos. Jaubert and Co.

ROUVILLE Seigniory, Rouville county.

Parishes of St. Hilaire and St. Jean Baptiste, lots 213 to 215, 218 to 224, 301 to 327, 332, 333, 391 to 394, 401 to 406, 417 to 419.

Ref.: Office records. Que. Dept. Mines, P.R. 443, p. 44.

These lots were staked in 1954 by Chess Uranium Corporation later Chess Mining Corporation. Investigations for phosphate in 1959, 2,000 feet of diamond drilling in 8 holes along a zone 2,500 feet long, rocks encountered were pyroxenite, gabbro and syenite containing 8, 5 and 3% apatite respectively. One zone 1,000 feet long by 50 feet wide contained 8% apatite.

SUZOR Township, Laviolette county.

Ref.: Que. Bur. Mines, 1936, pt. B, p. 29 and office records.

The suzorite discovered in this township which consists of 80% fine grained phlogopite is said to contain about 7% apatite. The apatite is fine grained, the crystals are colorless or light green and they are never more than 3 or 4 mm. in size. Some laboratory studies in 1943 have shown that the apatite is amenable to concentration by simple methods.

TEMPLETON (Gore of) Township, Papineau county.

Lots 1 to 46.

Ref.: 1, p. 132 and 137; 2, p. 33; 3, p. 25; 4, p. 100.

Localities mentioned, lots 16, 17, 18 operated by Blackburn, lot 35 by Allan and Fleming, lots 6, 12, 38 by Murphy and 39 by Stewart. The phosphate is associated with mica which has been the main product in most cases.

TEMPLETON Township, Papineau county.

Range IV, lots 21, 22.

Ref.: 2, p. 26; 4, p. 100.

McTierney mine (lot 21), Taylor and McVeity mine (lot 22).

Range V, lots 9, 10, 11.

Ref.: 4, p. 89.

The McRae mine opened in 1891 and produced about 500 tons of apatite. Considerable bodies of phosphate proved by diamond drilling.

Range VI, lots 4, 15, 17.

Ref.: 4, p. 100.

Localities mentioned, McIntosh mine (lot 4); Brody mine (lot 15); Canada Industrial Company (lot 17).

Range VII, lots 3 to 7.

Ref.: 1, p. 131; 3, p. 25; 4, pp. 89 and 100.

Lots 3, 4, 6 are McLaren mine, lot 7 is Grier mine.

Range VIII, lots 6 to 8, 17, 18.

Ref.: 1, p. 136.

Localities mentioned.

Range VIII, lot 15 E½.

Ref.: 1, p. 136; 2, p. 26, 27; 4, p. 89, 90.

Rainville or Dugas mine, opened in 1875 by W. Miller and worked by the Templeton and North Ottawa Mining Company. The Hon.

C.A. Dugas worked the mine for mica in 1891 extracting also a little asbestos from the northern part of the property, from that time the mine was worked intermittently for mica by various operators. It is said that more than 2,000 tons of phosphate was produced on this lot before 1892. The phosphate and mica crystals are associated with calcite, fluorite, amethyst and pyrite in pyroxenite.

Range VIII, lot 15 W½.

Ref.: 1, p. 136; 2, p. 27, 28; 4, p. 90; Min. Ind. Prov. of Quebec, 1945, p. 42.

The Phosphate King mine worked a number of years by A.J. Stevenson before 1893 when property was transferred to Ths. Waters who organised the Lake Girard Mica System. Little phosphate was mined after that date but mica was produced at different times by various operators until 1906. During the second world war, Blackburn Brothers worked the mine for mica and sold the apatite as a by product. Some 8,000 tons of apatite are said to have been mined from this property in the eighties. The mica and phosphate occur in pockets.

Range VIII, lot 16.

Ref.: 1, p. 136; 2, p. 28; 4, p. 91.

The Wallingford mine opened in 1882 by G.H. Beacon and acquired a few years later by the Pacific Guano and Phosphate Co. who operated the mine until 1891; Wallingford Bros. operated the mine until 1902 for mica and continued in later years under the name of Wallingford Mica and Mining Co. The deposit is of the fissure and pocket type and carries large quantities of pink calcite in addition to mica and phosphate.

Range IX, lots 5, 6, 11, 13, 21, 26.

Ref.: 1, p. 136.

Localities mentioned.

Range IX, lot 4.

Ref.: 2, p. 29.

Worked in 1892 for phosphate and mica by Lee Bros. who sold the property to the Watters Syndicate. In 1900, the mine was operated by Ch. Meger under the name of Sophia, mica was then the only product.

Range IX, lots 9, 16.

Ref.: 1, p. 132; 2, p. 30; 4, p. 100.

Lot 9 is Coursolles and Belcourt mine and lot 16 is Greer mine.

Range IX, lot 14 S½.

Ref.: 1, p. 136; 2, p. 29; 4, p. 91, 92; Min. Ind. of the Prov. of Quebec 1945, p. 42.

Opened about 1878 by Mr. Wellington and worked especially for mica by various operators from 1893. During the second world war, A. Trudel sold a small tonnage of apatite from this deposit. Calcite veins with pyroxene, mica and phosphate have widths varying from 2 to 12 feet.

Range IX, lots 17, 18.

Ref.: 1, p. 136; 4, p. 92.

The Goldring mine worked from the late seventies until 1910

by various operators among whom were Mr. John McLaurin, the Goldring Phosphate Company, Hebert and Ouimette and Co., The Papineauville Lumber Co. Massive green apatite and pink calcite with some mica at the contact of pyroxenite with a quartz band.

Range X, lots 5 to 7, 11, 13, 14, 17 to 19, 23 to 25, 27, 28.
Ref.: 1, p. 136; 4, p. 100.

Localities mentioned, lot 7 is Greer mine, lot 14 is Pearson mine, lot 27 is Thompson mine, lot 28 is Greer mine.

Range X, lot 8.
Ref.: 1, p. 136; 2, p. 39; 4, p. 93.

The Marsolais or Lucky Jack mine, worked extensively for phosphate in the eighties by the Templeton and North Ottawa Mining Co. From 1897, the dumps were reworked by various operators to recover the mica.

Range X, lot 9 E½.
Ref.: 1, p. 132; 2, p. 30; 4, p. 93.

The Post mine, opened by Mr. Post in 1878 and operated between 1889 and 1893 by the Canada Industrial Company. Various operators worked the mine for mica until 1909. Phosphate is in sugary form or in crystals often associated with calcite pyrite and pyrrhotite.

Range X, lot 9 W½.
Ref.: 1, p. 131; 2, p. 30; 3, p. 25; 4, p. 93, 94.

The Jackson Rae mine, operated on a large scale between 1878 and 1890 by the Jackson Rae Phosphate Company. The phosphate and mica occur as pockets in pyroxenite, associated with tourmaline, actinolite, titanite and calcite.

Range X, lot 10 N½.

Ref.: 1, p. 131; 2, p. 31; 4, p. 94.

The Jubilee or Smith mine, opened about the year 1888 by the McLaurin Phosphate Mining Syndicate, later worked for mica by McLaurin and McLaren Co. The production of phosphate was on a small scale.

Range X, lot 10 S½.

Ref.: 1, p. 136; 2, p. 31; 4, pp. 94-95.

The Murphy mine, opened in 1878 has yielded little phosphate until 1892 when the Lake Girard Mica System acquired the property. The mine was active until 1900 and was operated especially for mica by Arthur Murphy and the Sills-Eddy Company. The ore bodies consist of irregular pockets of phosphate and mica in pyroxenite.

Range X, lots 15 W½, 16 N½.

Ref.: 1, p. 136; 2, p. 31; 4, p. 95.

The Victoria mine opened in 1899 by McLaurin and McLaren. Very little phosphate was produced but the mineral is present in three well defined leads. Asbestos has been reported in the south part of lot 15.

Range XI, lots 3 to 6, 12 to 15, 17, 18, 24, 25.

Ref.: 1, p. 136; 4, pp. 95 and 100.

Localities mentioned; lot 6 was worked by the Templeton and Blanche River Mining Co. in 1886; lot 12 was the Stewart mine.

Range XI, lots 7 N½, 8, 9, 10, 11.

Ref.: 1, p. 130; 2, p. 31; 3, p. 25; 4, pp. 95 to 97.

This is the Blackburn or North Hill mine which has had the longest period of sustained activity among the mines of the Templeton district, mining was confined to lots 9 and 10. It was opened in the eighties by Messrs Blackburn and McLaren and operated on an extensive scale for the production of phosphate until 1892 during which time it produced about 40,000 tons of phosphate. The mine was operated from 1888 to 1895 by the East Templeton District Phosphate Mining Syndicate Ltd., and from that date on by Blackburn Brothers who worked it almost continuously until 1940. At that time the main surface opening was 400 feet long by 180 feet wide and 150 feet deep. The underground workings were reached by three shafts one of which was 160 feet below the bottom of the open pit. At one time, the company employed 120 men for the extraction of mica and up to 800 girls in the cutting plant at Hull.

The phosphate and mica deposit is associated with pyroxenite enclosed in a biotite gneiss and cut by numerous pegmatite dikes.

Range VII, lots 2, 8 to 12, 14, 17 to 24.

Ref.: 1, p. 136; 4, p. 100.

Localities mentioned, lot 2 is the Miller mine, lots 8 and 9 are the McLaurin mine, lots 12 and 21 were operated by Templeton and North Ottawa Mining Co., lot 20 is the Laurin mine.

Range VIII, lots 4 to 7.

Ref.: 1, p. 132; 3, p. 25; 4, p. 98.

The Battle Lake mine operated for phosphate in 1886 and 1887 by the Anglo-Canadian Phosphate Co.; later worked for mica by the Wallingford Mica Mining Co.

Range XIII, lots 22, 23.

Ref.: 1, p. 136; 4, p. 98, 99.

The Breckin mine opened about the year 1880 by Mr. Breckin who extracted a large quantity of high grade apatite during the eighties. Scapolite and sphene are said to be plentiful together with mica and phosphate.

VILLENEUVE Township, Papineau county.

Range I, lots 32 to 36. Range II, lot 1. Range III, lot 5. Range IV, lots 1, 2. Range VI, lots 1, 2, 6. Range VII, lot 1.

Ref.: 1, p. 137.

Localities mentioned.

WAKEFIELD Township, Gatineau county.

Range I, lots 6, 7, 11, 13, 16, 17, 23, 24.

Ref.: 1, p. 137; 4, p. 100.

Localities mentioned; lot 6 is McBride mine, lot 14 is Mullins mine.

Range I, lot 12.

Ref.: 1, p. 133; 2, p. 41; 4, p. 100.

Haldane or Hughes mine opened in 1878 by Haldane & Sons. More than 4,500 tons of phosphate are said to have been produce until 1892. The apatite is associated with mica, epidote, scapolite, chabazite, natrolite as well as abundant pyrite in places.

Range I, lot 15 S½.

Ref.: 1, p. 137; 4, p. 101.

The Comet mine has the honor of being the first to have shiped phosphate in Canada. The first operators were Messrs Chitty and Laken who were succeeded by a number of operators who extracted mica as well as phosphate until 1910.

Range II, lots 10, 12 to 15, 19 to 23.

Ref.: 1, p. 137.

Localities mentioned.

Range II, lot 16.

Ref.: 1, p. 137; 2, p. 42; 4, p. 101.

The Kodak mine worked in the eighties for phosphate and later for mica by various operators until 1908.

Range II, lot 17.

Ref.: 1, p. 137; 2, p. 42; 3, p. 26; 4, p. 101.

The Wilson, Morris or Kitty Lynch mine, opened in 1880 by J.A. Wilson who mined about 300 tons of phosphate. The mine was active

until 1907 producing principally mica.

Range II, lot 18.

Ref.: 1, p. 137; 2, p. 42; 3, p. 26; 4, p. 102.

Seyhold or Moore mine, first worked for phosphate by Isaac Moore in 1880 and later until 1903 for mica by Messrs Seyhold, Gibson and McLean.

Range III, lots 12, 13, 16, 18, 19, 20, 22, 24, 25, 29, 30.

Ref.: 1, p. 137; 4, p. 102.

Localities mentioned, lot 16 is the Thompson mine which yielded small amounts of mica as well as phosphate.

Range IV, lots 3, 10, 22 to 26, 29, 30.

Ref.: 1, p. 137; 4, p. 102.

Localities mentioned, lot 24 is part of Gemmil mine mostly in Range V.

Range V, lots 10, 20, 21, 25 to 28.

Ref.: 1, p. 137.

Localities mentioned.

Range V, lots 22, 23, 24 S$\frac{1}{2}$'S

Ref.: 1, p. 134; 3, p. 26; 4, p. 102, 103.

The Gemmil mine worked on lot 24$\frac{1}{2}$ S of Range IV as well as in Range V and produced about 4,000 tons of phosphate between 1879 and

1886. Phosphate is usually reddish and of good quality. Associated minerals are scapolite, tourmaline and zircon. Almost perfect crystals of apatite were recovered on lot 23.

Range VI, lots 24 to 26.

Ref.: 1, p. 137.

Localities mentioned.

Range VI, lot 27.

Ref.: 4, p. 103.

This mine was opened much later than the other mines of the district by R.W. Eady in 1905. It was worked especially for mica but phosphate was recovered as a by product and sold in small quantities.

Range VIII, lot 29.

Range IX, lot 30.

Ref.: 1, p. 137; 3, p. 26; 4, p. 103.

Localities mentioned, lot 30 was worked for phosphate between 1879 and 1883 by Mr. Harris who is said to have produced about 400 tons of phosphate.

WALTHAM Township, Pontiac county.

Range B, lots 15½W, 16½W, 17½W,

Ref.: 1, p. 137.

Localities mentioned.

WELLS Township, Papineau county.

Range I, lots 16 to 18. Range II, lots 11 to 14. Range III, lot 14.

Ref.: 1, p. 137.

Localities mentioned.

WENTWORTH Township, Argenteuil county.

Range VII, lot 92 W$\frac{1}{2}$.

Ref.: 2, p. 59.

Phosphate associated with mica.

BARITE

There has been very little production of barite in Quebec and the following list of occurences serves only to illustrate where lie the areas of interest for prospecting. The two important zones are in the sandstone and conglomerate rocks of the Sillery formation on the south shore of the St. Lawrence River and the crystalline limestone of the Grenville sub-province.

PRINCIPAL REFERENCE

(1) H.S. Spence, Barium and Strontium in Canada. Can. Dept. Mines Br. publ. no 570, 1922.

LIST OF OCCURRENCES

BUCKINGHAM Township, Papineau county.

Range IV, lot 21.

Ref.: 1, p. 57.

The barite occurs in six parallel veins in crystalline limestone over a total width of 100 feet and a length of 250 feet. The veins do not exceed 12 inches in width. The barite is soft, massive and creamy white in colour, it is associated with galena and zinc blende.

Range V, lot 22.

Ref.: Office files.

Barite deposit explored in 1941 by Importing Corporation Montreal Ltd. The vein is said to be three feet wide exposed in a trench 100 feet long. Sphalerite and galena are associated minerals.

HULL Township, Gatineau-Hull county.

Range X, lot 7.

Ref.: 1, p. 56.

The Foley mine, was worked between 1898 and 1903 by Canada Paint Co. during which time about 2,150 tons of barite was produced. The vein is said to be completely mined out, it averaged 3 feet in width and 350 feet in length; it was mined to a depth of 50 feet.

Range XI, lot 3. Range XII, lot 4.

Ref.: 1, p. 57.

Localities mentioned.

NICOLAS RIOUX Seigniory, Rimouski county.

St. Fabien Parish, Range I, lots 140 to 148.

Ref.: Que. Dept. Mines, Mining Industry for 1954, p. 47; office records.

This prospect belonging to Philippe Roy of Rimouski was prospected from 1953 to 1956 during which time a 200 foot adit was driven into the mountain and a barite vein averaging 4 or 5 feet in width and 125 feet long was discovered. Drifts were driven along the vein in 1961 and a bulk sample was recovered from the surface averaging 40% $BaSO_4$. The country Rock is sandstone and conglomerate of the Sillery formation. The barite which is massive, yellowish white and coarsely crystalline occurs in several other veinlets of less importance.

ONSLOW Township, Pontiac county.

Range III, lots 12 to 14.

Ref.: 1, p. 58; Dept. Col. Mines, Fisheries, Que. Mining Operations for 1916, p. 62; office records.

Northwest trending deposit containing several stringers of barite over a distance of 500 feet. In 1941, Adolphe Chénier and J.P. Moran shipped 101 tons of barite to the Pulverized Products plant in Montreal either from lot 12 or lot 14. The barite is soft and massive with green fluorite inclusions, the colour is white, pink or red. The report on Mining Operations for 1916 describes the vein as being 3 or 4 feet wide and traced over a distance of 4 lots in an east-west direction.

TEMPLETON Township, Papineau-Hull county.

Range VI, lot 11 E½. Range XII, lot 12. Range XIII, lot 13 N½.

Ref.: 1, p. 57.

Localities mentioned, zinc blende associated in some of the veins which are generally narrow. On lot XIII, 13 N½, rutile occurs in abundance in the barite.

WOODBRIDGE Township, Kamouraska county.

Range VI, lot 34.

Ref.: office records.

Barite lense exposed over a length of 200 feet and a maximum width of 5 feet. Some galena is present. Two diamond drill holes were sunk in 1953-54 by Mahlon W. Beach to prove the extension of the vein at depth and to intersect it at an angle. This drilling was not successful in proving a deposit of economic interest.

Range VII, lot 21.

Ref.: Mining Operation 1903, p. 51; G.S.C. Mem. no. 35, p. 39.

Barite vein described as being 2 or 3 feet wide and about 200 feet long. About 10% of galena is associated and only traces of silver.

BERYL *

Beryl is not being mined in the Province of Quebec, but deposits of beryl have been reported at more than thirty places. Mostly all the deposits have been in granitic pegmatites and have been observed during the search for other minerals such as mica, spodumene or molybdenite.

More than half of the deposits are in Abitibi-East county and are grouped in association with the granitic massifs in the townships of Lacorne, Landrienne, Figuery, Preissac, LaMotte and Fiedmont where "some pegmatites containing beryl are widely scattered over an area limited by the (two) zones in which spodumene is found" (1, p. 72).

The deposits in the Grenville geological sub-province, are scattered from Villeneuve, in the Buckingham area, to Natshishou river, on the north shore of the St.Lawrence. The reports are nearly all simple notes on the presence of the mineral and, as such, are of mineralogical interest.

PRINCIPAL REFERENCES

(1) G.S.C. Memoir 253

(2) Archives of the Department of Natural Resources

(3) Annual Report of Mining Operations in the Province of Quebec.

(4) G.S.C. Paper 44-9

(5) Mica in the Province of Quebec, Que. Dept. Col. Mines, 1901.

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* Compiled by B.T. Denis, office records 1955, with few additions and modifications.

(6) Northern Miner

(7) Que. Dept. Mines.

(8) G.S.C., Econ. Geol. Series no 11, 1932.

LIST OF OCCURRENCES

BERGERONNES Township, Saguenay county.

Block G.

Ref.: 2, 1942.

Beryl crystals have been found having a diameter up to three inches at the McGie mine.

1,500 feet south of eastern extremity of Lake Charlotte.

Ref.: 7, G.R. 32, p. 11.

Beryl is mentioned among the minerals that have been observed in a pegmatite dyke on the Simard property.

DELBREUIL Township, Témiscamingue county.

N.E. extremity of Lake Simard.

Ref.: 2, 1960.

Pegmatite dyke containing beryl, spodumene and garnet on property of Gill Mining Corp. Ltd.

DE MAISONNEUVE Township, Berthier county.

Range II, lots 1, 2. Range III, lots 1, 2.

Ref.: 8, p. 249; 3, (1905), p. 40.

The Maisonneuve mine containing few crystals of beryl associated with rare-element minerals.

DESROBERTS Township, Rouyn-Noranda county.

Ref.: 3, p. 214, 1912.

Only one crystal was observed.

FIEDMONT Township, Abitibi-East county.

Range IV, lots 41 to 44.

Ref.: 1, p. 88.

The presence of beryl was noted at one place in the pegmatite dykes containing also molybdenite.

FIGUERY Township, Abitibi-East county.

Range I, lots 20 to 33.

Ref.: 2.

Quebec Beryllium Limited explored this property in 1954-55. According to the engineer of the company, the pegmatite dykes that have been located on this property should contain 5,000,000 tons having an average tenor of 0.3% beryl.

Ranges I, II.

Ref.: 4, p. 10.

Beryl is found in the pegmatites near the granite massif that occupies a large part of ranges I and II of the township. In 1962, a 90 pounds sample was sent to the Mines Branch in Ottawa from the Milrot Beryllium property in Figuery township. The sample contained 20 to 25% beryl in hexagonal green or greenish-blue crystals of one inch maximum size. Concentration tests were made on this sample

and are described in I.R. no. 62-98 of the Mines Branch in Ottawa.

FOURNIERE Township, Abitibi-East county.

Range V, lot 14.

Ref.: 2, (1961, 1962).

A pegmatite vein was discovered on lot 14 in 1961 on the property of O.L. Giroux, it was uncovered for a length of 130' and is 15' wide. The country rock is greywacke or quartzite. Beryl is well distributed in single crystals and clusters, and constitutes 1 or 2% of the vein; one crystal 2.5 inches in diameter and 8 inches long was observed. Pegmatite is 90% quartz, 5% muscovite, 2 or 3% tourmaline and feldspar. Molybdenite specks are observed. The property was optioned and explored by drilling in 1962 by the East Sullivan Mines Ltd.

GRANET Township, Rouyn-Noranda county.

N. shore of Lake Granet, one mile below outlet.

Ref.: 3, 1943C, p. 14.

Three small crystals of beryl in pegmatite.

HARVEY Township, Chicoutimi county.

Range V, lots 15, 16 and S½ lots 6 to 14.

Ref.: 2, 1941.

The Xavier Lake mica mine discovered in 1939 and worked by the Roberval Mica Corp. Reg'd who extracted about 30,000 pounds of mica around 1941. One crystal of beryl observed was 3 feet long by 5 inches in diameter.

HUDDERSFIELD Township, Pontiac county.

Range IV, lot 20 N½.

Ref.: 2, 1950.

Some crystals of beryl in the pegmatites at Twin Valley mine.

JOHAN BEETZ Township and vicinity, Saguenay county.

At mounth of Watshishou river and west side of Ferland Lake.

Ref.: Que. Dept. Mines, G.R. no. 74, 1952, p. 48 and office records, 1959.

Crystals of beryl are of frequent occurence in pegmatite dykes associated with muscovite. One area staked in 1958 by Zenmac Metal Mines Ltd. near the mouth of the Watshishou river was mapped and explored in 1959; 8 locations of beryl occurences were described containing up to 1% beryl over widths of 3 to 4 feet along pegmatite dikes.

JONQUIERE Township, Jonquière-Kénogami county.

Range VIII, lot 15.

Ref.: 2, 1953.

A lens-shaped pegmatite dyke, 25 feet by 10 feet consisting of quartz, feldspar and minor amounts of biotite and beryl has been found on property of Arthur Larouche and later explored by Craig Murdock.

Range North, lot 21.

Ref.: 8, p. 253, Geol. Surv. of Can., Ann. Rept. 1883, pt D, pp. 9-10.

Large crystals up to 3 inches in diameter and 12 to 15 inches long recorded by Abbé J.C.K. Laflamme in 1883.

KENOGAMI Township, Jonquiere-Kenogami county.

Range II, lot 1.

Ref.: 3, p. 254.

Two small crystals in pegmatite.

LACORNE Township, Abitibi-East county.

Range I, lot 1.

Ref.: 1, p. 85.

Beryl is found in the Molybdenite Corp. of Canada mine.

Range II, lot 11.

Ref.: 1, p. 72.

Beryl has been observed in the pegmatite dykes that contain spodumene.

Range III, lots 2 to 11.

Ref.: 2, p.1956.

On the shore of Lake Baillargé, Amos Lithium Corp. explored three pegmatite dykes by surface trenching and diamond drilling. Spodumene and beryl are erratically distributed.

Range IV, lot 6. Range V, lots 1 to 6.

Ref.: 2, 1955.

These are the Goyette claims on which Isc Uranium Mines Ltd. did exploratory work in 1954 to evaluate a spodumene bearing pegmatite. The pegmatite also contains beryl, molybdenite and a bismuth mineral.

Range VIII, lot 16.

Ref.: 2, 1954; 4, p. 89.

In 1954, Massberyl Co. Ltd. did exploratory work on this lot which was part of their property in Lacorne township. This work showed the presence of at least seventeen pegmatite dykes of lengths ranging from ten inches to twenty-nine feet. According to the estimate of the engineer of the company, these dykes contain 27.5 tons per vertical foot, with a tenor of 3.84% beryl having a value of $19.20 a ton. According to information published (6 Oct. 21, 1954), a bulk sample of 673 pounds contained from 7 to 8% BeO.

Range VIII, lots 22, 23.

Ref.: 2, 1954.

In 1954, Valor Mines Limited explored these lots and others in Lacorne township. A little beryl was observed in some pegmatitic dykes containing spodumene and lepidolite. At one place, an area of 20 square feet contained 0.83% beryl and 3.09% spodumene. The exploration work was as follows:

Lacorne township, lot 46, range IX (Ref. 2, 1954)

" " lots 52-53, range IX (Ref. 1, p. 76)

" " lot 59, range IX (Ref. 1, p. 75)

" " lot 64, range IX (Ref. 1, p. 76)

" " lot 58, range X (Ref. 1, p. 76)

In the course of exploration of pegmatite dykes containing spodumene, beryl crystals were observed.

The properties of Massberyl Co. Ltd and Valor Mines Ltd. were taken over in 1960 by Massnal Mines Ltd.

LACOSTE Township, Charlevoix county.

Lake Pied des Monts.

Ref.: 2, 1942; 8, p. 250; 5, p. 21.

Some small beryl at Pied des Monts Lake mine.

LAMOTTE Township, Abitibi-East county.

Range V, lot 60.

Ref.: 2, 1957.

Narrow pegmatite dykes intersected in drilling by Consolidated Regus Mines Ltd, contained beryl crystals as well as chalcopyrite and native bismuth.

Range IX, lots 33 to 38, 31-32 ½N. Range X, lots 28 to 33 ½S.

Ref.: 2, 1956.

Milrich Petroleum Ltd. explored this property in 1956 and found beryl crystals in short and lenticular pegmatite dykes.

Range IX, lot 64.

Ref.: 1, p. 76.

Small dykes of pegmatite contain spodumene and columbite tantalite as well as beryl.

Range X, lots 60, 61.

Ref.: 4, p. 12; 2, 1957.

Beryl was observed in dykes under exploration for spodumene, on the property of Lacorne Lithium Mines Ltd.

LANDRIENNE Township, Abitibi-East county.

Range I, lots 25, 26.

Ref.: 1, p. 77.

Beryl was found in the pegmatite dykes containing spodumene.

MONTANIER Township, Rouyn-Noranda county.

2.5 miles N.E. of Montanier Lake.

Ref.: 2, 1957.

A pegmatite dyke 25 to 50 feet wide contains in addition to feldspar and quartz, crystals of muscovite, spodumene, tourmaline and beryl.

PREISSAC Township, Abitibi-East county.

Bloc F, west bank of Kewagama River.

Ref.: 3, 1911, pp. 189 and 194; 8, p. 247.

Nests of beryl crystals at the Molybdenite prospect of Height of Land Mining Co.

Range VII, lot 54.

Ref.: 4, p. 11

A little beryl was observed in a pegmatite that contains tantalum discovered by T. Aldous.

ROBERTSON Township, Labelle county.

Range V, lot 25.

Ref.: Que. Dept. Mines, G.R. 23, p. 47.

Beryl crystals were noticed in a large pegmatite dyke

where prospecting for muscovite and feldspar was being done.

SABOURIN Township, Rouyn-Noranda county.

Ref.: 1, 1934, C, p. 18.

Crystals of beryl found in three localities within pegmatites.

SURIMAU Township, Abitibi-East County.

1,000 feet west of point 3,700 feet southeast of mile 14 on Quebec Hydro Rapid VII road.

Ref.: 2, 1961.

Discovered in 1961 by L. Lacourcière and N. Bouliane. Pegmatite dyke exposed over length of 100 feet and width of 70 feet, contains feldspar, quartz, tourmaline, garnet and minor apatite in addition to beryl. Cluster of 25 or more crystals are seen at places but they constitute a very small percentage of the rock.

TACHE Township, Jonquière-Kenogami county.

Range V, lot 13.

Ref.: 8, p. 252.

Some beryl crystals were observed in a pegmatite dyke that was mined as a source of muscovite.

VILLEMONTEL Township, Abitibi-East county.

Range I, lot 33.

Ref.: 2, 1958.

A beryl occurence was reported on the property of Lavandin Mining Co.

VILLENEUVE Township, Papineau county.

Range I, lots 30, 31.

Ref.: 3, 1905, p. 40; 8, p. 240.

The presence of beryl was noticed at the Villeneuve mica mine.

CHROMIUM

Although chromite is a metallic mineral it is often considered as an industrial mineral because of its nonmetallic uses in refractories and chemicals which constitute important segments of the industry.

Chromite is not produced in Canada although the occurrences, especially in the serpentine belt of the Eastern Townships of Quebec, are very numerous. In times of emergency such as occurred during the two world wars, the chrome pits of the Eastern Townships were very active. The main trouble with our deposits of chromite is that they are generally small and low grade, and that competition with low wage producing countries is not possible to meet.

The prices of chrome ore vary according to their content of Cr_2O_3 which generally must be higher than 44% and to their chromium-iron ratio which should be at least 2.4:1. For refractory uses the silica content should be low because of its effect on lowering the fusion point. The chemical industry requires an ore with a high chromium content.

During the first world war, an ore containing 48 per cent Cr_2O_3 sold as high as $70.00 per ton, and during the second world war the price for similar material with a chromium-iron ratio of 3:1 sold for $45.00 per ton. Now, the best prices obtainable for high quality chromium ore is of the order of $33.00 per ton.

The Quebec ores can generally be concentrated to the required Cr_2O_3 content but the chromium-iron ratio is usually below 3:1 resulting

in a lower price for the product. Lump ore used in the manufacture of refractories is more difficult to obtain because the ore must be ground fine to separate the mineral from the gangue.

In the last ten years, the consumption of chromite in Canada varied from 36,000 tons to more than 70,000 tons according to the Dominion Bureau of Statistics. Ferrochromium consumption varied from 4,700 tons to 13,000 tons in the same period. The principal consumers are Atlas Steel Ltd, Crucible Steel of Canada Ltd., Fahralloy Canada Limited, The Steel Co. of Canada Ltd., Canadian Refractories Ltd. and General Refractories of Canada Ltd.

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(2) Denis, B.T., The Chromite deposits of the Eastern Townships, Quebec, Q.B.M., An. Rept. 1931, D 1-112, 1932.

(3) Harvie, R., Chromite in Quebec, C.G.S. Sum. Rept. 197 E-44, 1919.

(4) Poitevin, E., Chemical and mineralogical studies of some Quebec chromites, C.G.S. Sum. Rept. 1930, D 15-21, 1931.

(5) Stockwell, C.H., Chromite Deposits of the Eastern Townships, Quebec, Can. Inst. Min. & Met., Trans. vol. 47, 71-86, 1944.

(6) The Mining Industry in the Province of Quebec

(7) Mining Operations of the Province of Quebec or Dept. of Colonisation and Mines

(8) Departmental files.

LIST OF OCCURRENCES

AWANTJISH Township, Matapedia county.

Range IV, lot 11.

Ref.: 2, p. 101; Que. Dept. of Mines, G.R. no. 9, p. 24, 1941.

The Plante prospect discovered in 1927. Disseminations and small lenses of chromite in serpentine one of which is 10 inches wide and about 40 feet long. Diamond drilling and exploration work was carried out in 1942 and 1943 by the Alchrome Prospecting Syndicate of Toronto but no satisfactory results were obtained.

BOLTON Township, Brome county.

Range IV, lot 13; Range VI, lots 26, 27; Range VI, lots 9, 13, 23, 26; Range VIII, lot 23.

Ref.: 2, p. 99; 7 (1903) p. 28.

These localities are mentioned by Obalski (1903), according to him, a shipment of 27 tons was made from lot 9, range VII in 1896. During the last war, the pit was known as the Stark deposit. It contains small pods of chromite in serpentine.

BROMPTON Township, Richmond county.

Range IX, lots 25, 26, 28; Range X, lot 28.

Ref.: 2, p. 100; 7 (1903) p.9.

Considerable prospecting and exploration work was done on the property of Fletcher Corp. Limited from 1940; in 1942, the company made substantial shipments of chromite concentrated by hand sorting. During the war 1912-1918 about 200 tons of chromite had been shipped from these pits.

CLEVELAND Township, Richmond county.

Range X, lots 7, 8.

Ref.: 2, p.95; 6, (1945), p.13; 5, p.83.

This property known as the Sterret mine was opened in 1916 by D.B. Sterret and in the following 2 years more than 10,000 tons of crude ore and concentrates were shipped from this mine. During the second world war mining operations resumed on a large scale, the shaft was deepened and the ore body was developed on the 300 and 400 foot-levels. Chromite Limited, which operated the Sterret mine near St. Cyr, built a 150 ton concentrator in 1941 using Wilfley tables. This mine produced almost as much chromite during the war years as all the other producers combined, the tenor of the concentrate was 48% Cr_2O_3 or better. The ore bodies occur in lenses within serpentine, their widths may vary from a few inches to 18 feet. The company was contemplating the deepening of the shaft to the 600 foot horizon when work was abandoned in mid 1945.

Range XIV, lot 7A.

Ref.: 8.

C.H. Stockwell examined this property belonging to Donat Salvas in 1942 and reported a small showing of chromite in serpentine. This showing was not developed.

COLERAINE Township, Mégantic county.

Block A

Ref.: 2, 5, 6, 7, 8.

Block A is situated near the north-west corner of Coleraine Township and comprises an area of almost 6,000 acres between Black Lake to the north, Caribou Lake to the south and extending west as far as St. Joseph de Coleraine. This area is totally underlain by peridotite and some dunites in which numerous occurrences of chromite are known to exist. No attempt will be made here to describe the 60 or more occurrences in the area; most of these have been worked at the turn of the century and some during world wars 1 and 2. The ground in Block A is held by Asbestos Corporation Limited.

Greenshields deposit

This deposit is the best known in the area of Block A, it is situated some 1,500 feet east of the railroad and about 4,700 feet north west of Caribou Lake. It was discovered in 1898 and was very active during the following ten years, producing some 30,000 tons of chrome ore. During world war 1, the workings were dewatered but no production was reported. During world war 2 an extension of this deposit was uncovered by trenching and some promising ore was found in a fault zone, 220 feet north-east of the old pit.

Croteau deposit

This deposit lies some 60 feet southwest of the Greenshields pit. It was discovered during world war I and produced an unknown quantity of ore during that period. In 1941, Chrome Association conducted mining operations at this site but the production was small.

Bergeron deposit

This deposit was discovered in 1941 some 60 feet southwest of the Croteau pit. It was mined during the war by Chrome Association.

Caribou deposit

This deposit is a few hundred feet north of Caribou Lake in an area that has been extensively worked during the early part of the century judging by the numerous pits. The main pit was opened in 1895 and was worked during world war I by Black Lake Asbestos and Chrome Co. who sank a shaft some 200 feet deep with levels at 115 feet and 188 feet. In 1942, Asbestos Corporation Limited undertook a programme of diamond drilling and found a deposit containing some 25,000 tons of indicated ore underneath the old workings; no mining was carried out.

Nadeau and Lambly deposits

These deposits lie 800 to 1,200 feet to the east of the Greenshields pit. They were worked at the end of the last century and again during the second world war. The Lambly pit which is the most easterly, is the site of the first discovery of chromite in Coleraine township.

Vaillancourt deposits

These deposits lie about 1,000 feet north of the Caribou shaft; they consist of a series of seven pits extending over a distance of 500 feet in a north-easterly direction. A small production was reported in the early years of the century but no work was done during the war years.

Fréchette deposit

This deposit is situated some 4,500 feet north of the Greenshields pit. A production of about 1,000 tons of high grade ore was reported at the end of the last century. This deposit was inactive during the two world wars.

Standard deposit

This deposit is located about 1,000 feet west of the reservoir which supplies water to the village of Black Lake. There are three pits at this location from which some 3,000 tons of high grade ore were mined in 1895. A smale production was also reported during world war I and since then there has not been any activity at this site.

J. Obalski (7, 1903), F. Cirkel (1) and B.T. Denis (2) have described a few other occurrences of chromite in Block A of Coleraine Township but they seem to have little importance as a possible source of ore. The Provencal deposit described by Stockwell (5, p.85) is situated in Block A about one half mile south of the Greenshields deposit; disseminated chromite with patches of massive ore were uncovered in 1942 near some old pits. No mining was carried out at this location.

Range X, lot 19.

Ref.: 2, p.83; 5, p.82.

Chromeraine deposits

These deposits were formerly known as the Reed-Bélanger and Mutual Chemical Company deposits; they straddle the dividing line between lot 19 S.E. and lot 19 N.W. The discovery of chrome at this location dates back to 1894 but the production lasted only until 1896 during which time about 500 tons of ore were extracted. Production resumed during the war years after the discovery of the main orebodies in 1916. A total of about 55,000 tons were extracted from these deposits both by underground and open pit methods until the end of 1951. In 1942, the Wartime Metals Corporation erected a mill to treat 600 tons per day. This mill operated from May 1943 until August 1944 during which time it was treating ore at a rate of about 375 tons per day.

The Chromeraine deposits can be traced over a length of 2,000 feet reaching widths of 60 feet in places. The ore is generally low grade (about 10%) with some high grade, massive pockets.

There are several other pits on lot 19 N.W., range X, from which ore was produced during and before world war I; they are concentrated in the N.W. corner of lot 19 and to the south of the main chromeraine ore body.

Range II, lots 25, 26.

Ref.: 1, p. 58; 2, p.76; 5, p.84.

Montreal deposit

This deposit situated about one mile east of Petit Lac St. François was originally opened in 1894 by Mssrs. H. and T. Leonard, D. Morin and A. Labrecque who mined about 3,200 tons of ore. From 1901, the property was owned by the Montreal Chrome and Iron Company who erected a mill and produced concentrates until 1903. In 1906, the Black Lake Chrome and Asbestos Company became owners and conducted a considerable amount of exploratory work until 1910. Mr. Aurèle Paré operated the mine during world war I on a lease basis or on contract for Dominion Mines and Quarries Ltd. and produced about 20,000 tons of low grade ore. Aurèle Paré operated the mine during the second world war on a contract basis for Saint-Lawrence Alloys and Metals. The ore was cobbed and shipped to the Electro-Metallurgical Company in Welland, Ontario.

Range A, lot 16.

Ref.: 2, p.67; 5, p.86; 1, p.60.

Hall deposit

This deposit was discovered in 1899 by Jos. Nadeau and R. Tapping who produced about 1,700 tons of ore until 1903. The property was then acquired by the Canadian Chrome Company who erected a mill and operated the

mine during the boom period before world war I. Dominion Mines and Quarries Limited took over the property during the first world war and produced about 1,000 tons of ore. During world war II the mine was operated first by W. Roberge and W.B. Metivier then by W. Roberge. Cobbed ore was shipped to the Electro-Metallurgical Company in Welland, Ontario.

Range A, lot 18.

Ref.: 2, p.71; 5, p.86.

Stewart deposit

This deposit was discovered in 1903 by Robert Stewart; a small production was recorded in 1918. Mining was carried out during the second world war after the discovery in 1942 of several blocks of ore. Wilfrid Roberge of Thetford Mines made several shipments of ore from this lot in 1942.

Range X, lot 7.

Ref.: 5, p.86.

Ward deposit

This deposit was discovered in 1938 and the mining rights were first acquired by Chromium Mining and Smelting. In 1940, Albion Ward, Tancrède Labbé and J.A. Lambert acquired the property and shipped a small tonnage of ore in 1941. In early 1943, mining operations were carried out by Rhio Morisset and in late 1943, Chromeore Limited moved their mining plant to this property from the Gagné deposit on lot 25, range III of Coleraine township. Several shipments of chromite were made in 1944.

Range A, lot 17

Ref.: 2, p.70; 6 (1940), p.12.

This prospect was discovered around 1930 by E.T. Gray who did some exploratory work on the property which had been staked previously in 1901 by Jos Lemelin. In 1940, J.E.A. Perreault of Thetford Mines took out a few tons of ore from the old workings operating under the name of Thetford Ferro-Chrome Company.

Range XII, lot 8.

Ref.: 6 (1942), p. 12.

Matte prospect

There was some activity on this lot during world war II when J. Louis Matte of Thetford Mines did some exploration work. No production was recorded.

Range III, lot 25 (N.W. 1/2)

Ref.: 2, p.82; 6 (1943), p.26.

Gagné deposit

This deposit was discovered near the end of world war I at which time some 3 or 4 carloads of ore were shipped. In 1943, Arthur Harvie and Albert Paradis operating under the name of Chromeore Limited shipped some ore to the Chromeraine Project mill.

Range B, lots 6 and 7.

Ref.: 2, p.71; 1, p.61.

American Chrome Co. deposit

This deposit was discovered around 1894 and was quite active until 1905. In 1915, Mr. D. Wilson reopened the pits and produced about 500 tons of ore. The Mutual Chemical Company took over the property in 1916 and erected a mill of 80 tons daily capacity but not more than a few hundred tons were produced. The mill was sold in 1918 to the Quebec Asbestos and Chrome Company at St. Cyr.

Range B, lot 26.

Ref.: 2, p.75; 1, p.62.

Ross deposit

This mine was active from 1898 when R.P. Hall did some exploratory work. J.M. Johnston extracted some 500 tons in 1900 and 1901 and again in 1915 and 1916 when he produced about 4,500 tons.

Range B, lots 27, 28.

Ref.: 2, p.76.

No. 6 pit

The deposit known as No. 6 pit was operated by Black Lake Asbestos and Chrome Company, who produced some 14,500 tons of ore in 1916.

Range B, lot 23.

Ref.: 2, p.74.

Noel deposit

This mine operated intermittently before 1908 and during world war I when small shipments of ore were recorded.

Range XIII, lot 8.

Ref.: 2, p.87; 1, p.64.

Huard deposit

About 50 tons of ore were mined from this deposit in 1894-1895. During world war I, L.H. Huard and others extracted a small tonnage of disseminated ore.

Coleraine township is certainly one of the most promising areas to seek chromite deposits in Quebec. The production has been important in the past; considerable exploration has been carried out especially in Blocks A and B, in Ranges A, B, C, I, II, III, IV, X, XIII. Many pits exist in this township besides the ones mentioned in this report but in general they have not been productive.

GARTHBY Township, Wolfe county.

Range I, lots A, B, C; Range II North, lots 5, 6, 7, 8.

Ref.: 2, p.90; 7 (1898) p.13.

These deposits are known since 1894 at which time, H. Leonard extracted some 400 tons of high grade chromite from lot C, range I. During world war I, a small shipment of ore was made from this lot. In 1943, Disraeli Chromite Registered acquired the mining rights on these lots and did some exploratory work.

Range V, lot 37,

Ref.: 2, p.92; 7 (1898), p.94.

Brousseau deposit

This mine was opened in 1896 and produced some 35 tons of ore. In 1916, the mine was reopened and a production of 116 tons was recorded. There was no activity during world war II.

HAM-SOUTH Township, Wolfe county.

Range I, lot 21½ W.

Ref.: 2, p.93; 7 (1898), p.15; 1, p.66.

This deposit was discovered in the 1890's at which time it belonged to Dr. J. Reed. It is characterized mainly by the high percentage of magnetite in the ore. The production from this pit has been very small (about 100 tons), but the deposit is possibly large and could be explored easily by magnetic methods.

Range I, lot 15.

Ref.: 6 (1940), p.12.

Reed Realties Limited did some work on this lot in 1940. No production was recorded.

Other known occurrences of chromite in Ham-South Township are on lot 21, range I, south of Nicolet lake, lots 24 and 27, range I, and lots 4 and 20, range II; the occurrence on lot 21, range I, was the site of the first chromite mining in Canada in 1861.

IRELAND Township, Mégantic county.

Range I, lot 28.

Ref.: 2, p.98; 1, p.65.

King mine

About 50 tons were mined from this deposit prior to 1909. During the first world war the Bennet-Martin Asbestos and Chrome Co. mined about 2,500 tons of ore.

Range III, lot 26.

Ref.: 6 (1944) p.14.

Parent deposit

This deposit was worked during world war II by Joseph Parent and Eudore Deveau. In 1944, Willie Métivier shipped some stock-piled ore to Chromore Limited in Coleraine township.

LAPOTARDIERE Township, Gaspé North county.

Near adjoining corners of Lapotardière, Courcelette, Lemieux and Lesseps townships.

Ref.: Trans. Roy. Soc. Can., vol. XLII, May 1948, pp. 61-67, by F.F. Osborne and M. Archambault.

Numerous occurrences of float, disseminations and stringers in serpentine some masses but no large body. In 1943, the Mount Albert Mining Company Limited drilled a total of 4,591 feet in 35 holes; no minable body was discovered. The property was acquired by Gaspesia Mining Co. Ltd. in 1963 and a magnetometer survey was conducted without revealing any new bodies.

LEEDS Township, Megantic county.

Range X, lot 1.

Ref.: 2, p.95; 1, p.67.

A small occurrence in serpentine from which 54 tons were shipped in 1887. The ore is said to have contained 51% to 52% Cr_2O_3.

ORFORD Township, Sherbrooke county.

Range XII, lot 7.

Ref.: 2, p.100; 6 (1940), p.12.

Chromite was mined on lot 7, range XII, during world war I. In 1940, the Fletcher Corporation Limited dewatered the old pit and mining was resumed. Substantial shipments were made in 1941 and 1942 of hand sorted material.

THETFORD Township, Mégantic county.

Ref.: 2, p.94; 7 (1941) p. 11

Beaver pit

Asbestos Corporation made some shipments of chromite in 1941 from the Beaver pit. This ore had been mined previously in the course of asbestos mining operations. The body is said to be small but high-grade.

Range IV, lot 16.

Ref.: 2, p.94.

This deposit known as the Pennington mine, was never worked.

WEIR Township, Bonaventure county.

Range II, lots 28-38.

Ref.: 6, (1942) p.12.

On these lots which have been throughly prospected for asbestos since 1906, the Chromium Mining and Smelting Corp. did more exploration work in 1942 consisting of trenching and diamond drilling (6 holes, 1900 feet). No deposit of economic interest was found but very large boulders of chromite were observed.

WOLFESTOWN Township, Wolfe county.

Range III, lot 23.

Ref.: 2, p.89.

Several small occurrences of disseminated and massive chromite in serpentine. During first world war, a production of 60 tons was recorded.

CLAY AND SHALE

Clays suitable for the manufacture of common brick, drain tile and structural tile are widespread in the Province of Quebec. They have been used for making face brick but are generally difficult to fire to a dense, hard condition (1, p. 3).

The deposition of clays is necessarily linked with the history of glaciation as are all other unconsolidated deposits such as sands, gravel and boulder clays. Some stoneless clays were deposited during interglacial periods and are non-marine; other non-marine clays were deposited in glacial lakes which were formed between the height of land and the glacier during the latter's retreat, but by far the most important clays in the province were deposited in the Champlain sea which involded the St. Lawrence Lowlands and tributary valleys near the end of the Glacial periods.

The Champlain sea was more than 70 miles wide in the vicinity of Montreal, it covered the area south of the St. Lawrence River and west of the Champlain fault accumulating clay deposits measuring more than 150 feet thick in some places. The time of the invasion of sea water is generally estimated at about 11,400 years ago (9, p. 8); the time it lasted must have been quite long judging by the thickness of the clay left behind after the retreat of the sea water.

The clay deposits are best developed in the areas where the sea was deep; the consolidated sediments of the areas have been studied by several geologists (2, 3, 4, 5, 6, 7, 9, 10) and the clays have been

tested for their ceramic properties (1, 8) and for their possible use in the manufacture of lightweight concrete aggregates (12).

There are important accumulations of clay in the Lake St. John area which stands at a mean elevation of 500 feet above sea level. Fossils are quite rare in these deposits and although there is some evidence that the Champlain sea did invade this area, Chalmers (2, p.259) is not convinced of the marine origin of the stratified sands and clays having found a species of Unio (a fresh water shell) in a clay pit at Roberval. More recent work has convinced most geologists that the clays of Lake St. John area are marine, the body of water covering this area in late glacial times has been named the Laflamme sea.

The clay-belt in the counties of Abitibi and Temiscamingue is the results of accumulations of clays, silts, sands and gravels in the glacial lakes which formed immense bodies of water between the height of land and the glacier when the latter was melting and retreating. The clay deposits are characterized by varves or seasonal laminations. According to Keele (8, p. 105) who has tested these clays near Amos and the Bell river, "the clay compares favourably both in working and burning properties with any of the surface clays in the older settled portions of the province; but in order to obtain the best results it must be burned to a higher temperature than the clays of the St. Lawrence valley". These clays have never been used for the manufacture of ceramic products.

There are a few deposits of kaolin in Quebec which have been investigated but which have failed so far to produce a great tonnage of high-quality refractory clays (11, p. 79). The best known is the St. Remi deposit in Amherst township, Papineau county, which has produced about

9,000 tons of kaolin during the years 1912 to 1923.

For further information on the clays of Quebec, the reader is referred to the list of principal publications on this subject which follows.

Principal References

(1) Brady, J.G. and Dean R°S. The Composition and Properties of Ceramic Clays and Shales of Quebec. Dept. of Energy, Mines and Resources, Mines Branch; Ottawa, R-187, 1966.

(2) Chalmers, R. Surface Geology of Eastern Quebec; Geol. Surv. Can., Ann. Rept. vol. 16, 1904, pp. 250-263 (1906).

(3) Gadd, N.R. Surficial Geology of the Becancour Map-area, Quebec. Paper 59-8, Geol. Surv. Can., 1960.

(4) Gadd, N.R. Surficial Geology Upton, Quebec; Paper 60-27, Geol. Surv. Can., 1960.

(5) Gadd, N.R. Surficial Geology of Yamaska and Aston, Quebec; Geol. Surv. Can., maps 43-1959 and 50-1959.

(6) Gadd, N.R. and Karrow, P.F. Surficial Geology of Trois-Rivieres; Geol. Surv. Can., map 54-1959.

(7) Karrow, P.F. Surficial Geology of Grondines; Geol. Surv. Can., map 41-1959.

(8) Keele, J. Preliminary Report on the Clay and Shale Deposits of the Province of Quebec; Geol. Surv. Can., mem. 64, 1915.

(9) Lasalle, P. Surficial Geology of Vercheres Area; Dept. of Nat. Resources, Quebec. P.R. no. 505, 1963.

(10) Lasalle,P. and Elson J.A. Surficial Geology of Beloeil Area; Dept. of Nat. Resources, Quebec. P.R. 497, 1962.

(11) Maurice, O.D. The Clay Deposits of Quebec; C.I.M.M. Sixth Commonwealth Mining-Metallurgical Congress, pp. 79-80, 1957.

(12) Wilson, H.S. Lightweight Concrete Aggregates from Clays and Shales in Quebec; Mines Branch, Ottawa, T.B. 48, 1963.

Clay producers, past and present

At present there are 9 producers and 11 plants using local raw materials in the manufacture of brick and tile, four of these use local clays exclusively, the others use a combination of clay and shale or shale exclusively. The annual production is in the order of 120 million bricks. In earlier times, clay was the only raw material, it was processed largely by hand but the operators were so numerous that they were able to produce 100 million bricks per year at the beginning of the present century.

For historical as well as practical purposes, a review of the old as well as the new localities where clay was used for making ceramic products is now given. The department files contain more than 300 company names, no attempt has been made to include all of them in the list

but we believe it useful to include the deposits which have been productive in the past.

LIST OF OCCURRENCES

ARGENTEUIL County.

Ref.: 8, p. 55; office files.

H.B. Mitchell produced bricks near Lachute in the early years of the century.

ARTHABASKA County.

Ref.: 12, p. 18; office files.

Brique Victoria Limitée, lot 480, Warwick township. This clay deposit was worked by Albert Côté before 1950, the production was continuous from 1950-1965.

Amédé Mathieu manufactured clay products from a deposit on lot 83, range B, parish of St. Victor, he sold this property in 1932 to L.H. Brunelle; Albert Côté acquired the property in 1936 and manufactured clay products until 1941. The property is now abandonned.

Other deposits in Arthabaska county now abandonned:

Lot 12, range II of Warwick township, operator Joseph Desrochers around 1910.

Lot 14, range I of Warwick township, operated by B. Gauthier around 1910 and later by the Warwick Brick Co.

Lot 18, range V of Stanfield township, operated by Evangeliste Gaulin between 1936 and 1942.

BAGOT County.

Ref.: office files; 12, p. 18.

The Acton Vale Brick Co. on lot 17, range I, Bagot Township, operated until 1933.

BEAUCE County.

Ref.: 8, p. 93; 12, p. 18; office files.

In range Aubert Gallion near St. Georges, bricks were produced from 1942 to 1961 by various operators of the Roy family and by the Briqueterie St. Georges West.

On lot 459 of St. Joseph, Joseph Giguère produced clay from 1945 to 1947 which he sold to pottery plants notably to the Syndicat des Ceramistes Paysans de la Beauce.

Bricks were also produced near St. Maxime in the early years of the century by J. Bte Gosselin.

BROME County.

Ref.: office files.

J.F. Isherwood produced clay and sold it to pottery manufacturers between 1952 and 1955. The deposit was on lot 75, range VI, Potton township.

CHAMBLY County.

Ref.: 12, p. 20; office files.

Cell-Rock Inc. worked a deposit of clay in 1962 on lot 211 of

Longueil Seigneury for the purpose of manufacturing lightweight aggregates. No production was reported.

CHATEAUGUAY County.

Ref.: 8, p. 72; office files.

On lot 61, range I of Ormstown, the Alexis Mills Brick Co. Regd. operated a brick plant until 1925. The capacity was about 1.5 million bricks per year. This deposit was first owned by Paul Cartier whose widow sold it to Alexis Mills. Frank Oliver became owner in 1927 but never produced.

CHICOUTIMI County.

Ref.: 8, p. 70; office files.

La Brique de Chicoutimi Ltée produced clay products until 1934; this deposit which is now built over was acquired in 1936 by Jules Tremblay who produced bricks until 1941. Near the City of Chicoutimi, la Poterie du Saguenay also produced clay products between 1941 and 1947.

COMPTON County.

Ref.: 1, p. 7; 8, p. 93; 12, p. 20; office files.

The East Angus Brick and Tile Inc. situated on lots 15A and 17A, range III, Westbury township, has been in continuous operation since 1944; before that, various operators produced brick at this location since the early 1920's.

DEUX MONTAGNES County.

Ref.: office files.

Brick were produced around 1910 by E. Côté at St. Placide and on lots 47-48 of St. Eustache by Alphie Danis.

DORCHESTER County.

Ref.: 8, p. 93; 12, p. 21; 1, p. 7; office files.

At Scott Junction, bricks have been produced almost continuously since the early years of the century. The name of the producer has changed at least six times, since 1947 it has been La Brique de Scott Ltée. The clay is believed to be of glacial lake origin (Ref. 1).

DRUMMOND County.

Ref.: office files.

There have been small installations for brick manufacturing in Wickham township, range I, near the St. Francis River and in Wendover township, range X, lot 10, near the Nicolet River; this last location was worked by Arthur Potvin between 1946 and 1952 producing a small quantity of bricks.

GASPE County.

Ref.: office files; 1, p. 7.

In Douglas Township west, lot 1, range I, E.P. Suddard Brick Works operated during a short period in the early 1930's.

GATINEAU County.

In Wakefield Township, lot 1, range V, Erik Jensen Erickson operated a small brick plant in the early years of the century.

HULL County.

Ref.: 8, p. 53; 12, p. 21; office files.

In Hull Township, range V, lot 5 on the Chelsea Road, Alex Richard and later H.P. Richard produced bricks until about 1915, the capacity of the plant was about 1,200,000 brick per year.

JACQUES CARTIER County.

Ref.: 8, p. 59; 1, p.8; 12, p.22; office files.

On the Island of Montreal there have been important producers of bricks in the first quarter of the Century notably Jos. Bernier who operated a brick plant on Iberville Street and C. Bourdon on Davidson Street; these plant had capacities of 2 million and 3 million bricks per year respectively.

More recently, Montreal Terra Cotta Ltd. was still operating a plant at Lakeside which was started around 1910, producing continuously until 1965; this plant has been inactive since 1966.

JOLIETTE County.

Ref.: office files.

Three operators are known to have produced bricks at St. Felix de Valois in the first decade of the century, they are Emile Longpré, Victor Beaudin and Edouard Bellerose; the capacity of their plants was about 300,000 bricks per year.

LABELLE County.

Ref.: office files.

La Briqueterie de Rapide de l'Orignal near Mont Laurier was active before 1926.

LAC ST-JEAN County.

Ref.: 8, p. 72; office files; 12, p. 23; 1, p. 8.

Near the village of Roberval, Keele (8) has tested the clays and fund them suitable for manufacturing common brick and drain tile. Brady and Dean (1) tested the clays near Mistassini. The only operator in this area was Benjamin Bouchard who manufactured bricks before 1930.

LAPRAIRIE County.

Ref.: 8, pp. 13-17; 12, p. 23; 1, pp. 6-8.

The brick plants near Laprairie and Delson has been and are still the most important producers of bricks in the Province. The raw material used is mostly Utica-Lorraine shales but some pleistocene clays are also used. The Domtar Construction Materials Ltd. have two plants in Laprairie and Delson and the St. Lawrence Brick Co. Ltd. has a plant at Laprairie.

Domtar Construction Materials Ltd. acquired the properties in 1962 from Cookville Laprairie Brick Ltd; before that, there had been a succession of owners starting with the Laprairie Brick Co. This latter company was already producing 62 million bricks in 1910; the two plants of Domtar can now produce more than 10 million bricks per month.

The St. Lawrence Brick Co. Ltd has also been in operation since 1912, the present capacity of their plant is of the order of 3 million bricks per month.

LAVIOLETTE County.

Ref.: 12, p. 24; office files.

In the southern part of Laviolette County on lot 212 of the parish of St. Tite, La Briqueterie de St. Tite Inc. was operating as recently as 1959 and had been in continuous operation under various names since the early twenties. Nearby, on lots 214 and 225 other operators had been active in the first decade producing more than 2 million bricks each year.

L'ISLET County.

Ref.: 8, pp. 96-99; office files.

In range I, lots 251-254 of the parish of Bonsecours, La Compagnie de Brique L'Islet Limitée produced bricks from 1915 to 1931 and was succeeded by la Compagnie de Brique Panet Ltee who operated until 1938. Other operators like Napoleon Boulanger, Joseph Tondreau and Jos. Bélanger also produced bricks in this vicinity during the first decade of the century.

LOTBINIERE County.

Ref.: 8, p. 84-87; 1, p.75; 12, p. 24; office files.

The brick and tile industry near the town of Deschaillons has been one of the most productive in the province since the early days of the industry. The clay pits are all located in the first range of the Deschaillons Seigneury facing the St. Lawrence River.

Montreal Terra Cotta Ltd is now the only important producer having acquired the properties of former operators and having extended its holdings to a considerable part of the clay deposits near the river. In 1946, Montreal Terra Cotta acquired the property of Brique St-Jean Ltée who had brought it from Michel Parrot in 1943. This operation was started around 1930 by La Briqueterie ou Brique de Lotbinière; production was intermittent until the time of the acquisition by Montreal Terra Cotta Ltd.; the capacity of this plant is about 2,500 tons per month of drain tile, terra cotta and chimney flue.

Another recent operator has been Antique Brick Limited who acquired the property of Demers et Bordeleau in 1966. This property which is next door to the preceeding was first operated by Alphonse Potvin around 1930 and sold to Jean-Baptiste Potvin and J.M. Chandonnet in 1945 who operated until 1950, Demers et Chandonnet were operators until 1955 when it was acquired by Demers et Bordeleau.

Other operators in this area have been the families of Beaudet, Charland, Pérus, Bussière, Chrétien, Desroberts, Laliberté, Tousignant,

Hamel and Castonguay who were mostly active in the first decade of the century.

According to Keele (8, p. 86), "these clays are among the best common brick materials in the province".

MATANE County.

Ref.: office files.

On lot 112, range I of Matane township, la Compagnie de Brique operated for some years before 1928.

MATAPEDIA County.

Ref.: 8, p. 37; office files.

Prior to 1924, Metis Shale Brick operated a brick plant on lots 78-82 of Lepage township. The property was sold to Darius Julien in 1955, but no production was recorded from this area in recent years.

MONTMAGNY County.

Ref.: 8, p. 95; office files.

In early years of the century a small operation existed in the valley of Rivière du Sud. Alex Caron and Joseph Gazé were the owners.

MONTMORENCY County.

Ref.: 8, p. 29; 1, p. 67-70; 12, p. 26.

One of the important brick plants in Quebec is that of Citadel Brick Company at Boischatel. Production at this plant has been continuous since the time of Keele's report in 1913. Common and face bricks are manufactured from local shale and imported clay. The capacity of this plant is 6 million bricks per month.

NICOLET County.

Ref.: 8, p. 84; office files.

Three small plants were in operation in Nicolet county before the first world war: la Compagnie de Brique des Becquets near St. Pierre, M. Leblanc and Son in Maddington township and Arthur St. Armand in Aston township.

PONTIAC County.

Ref.: office files.

David T. Hodgins had a brick plant on lot 9, range V of Clarendon township. It was in operation intermittently between 1909 and 1941.

PORTNEUF County.

Ref.: 8, p. 64; office files.

Before the first world war at least four brick plants were in operation in Portneuf county on the banks of the Ste. Anne and Portneuf Rivers: Napoleon Genois operated a plant at St. Raymond, Elie Paradis was near St. Raymond on lot 35, Pointe des Fourches concession, Olivier

Douville was on lot 200, Ile-aux-Hurons concession and Eugene Papillon operated the brick plant of St. Basile Brick Company in St. Jacques concession.

QUEBEC County.

Ref.: 8, pp. 67-69; office files.

Deposits of clay near the city of Quebec on the banks of the St. Charles River have been worked since the early days of colonisation. These deposits are now either exhausted or abandonned because of the requirements of land for a growing city. Citadel Brick is still active near Beauport but the raw material used is now Utica-Lorraine shales instead of clay. In the early part of this century, the several brick plants near Quebec had an annual production averaging 7 to 8 million bricks per year.

RICHELIEU County.

Ref.: 8, p. 80; office files.

Several brick plants were operating on the banks of the Richelieu River at Sorel, St. Rock and St. Ours; no production has been accorded from these areas since World War I. The main location of production were on lots 129, 132, 133 and 1514 of the city of Sorel, lot 227 of St. Roch and in St. Pierre concession.

RICHMOND County.

Ref.: 8, p. 88; office files.

Clay has been worked in Richmond county near the banks of the St. Francis River at Bromptonville and Richmond. The most important plant was that of Proulx Brothers who operated before World War I and sold the property to Richmond Brick Co. in 1930. S.E. Desmarais acquired the property in 1935 and sold it to Gérard Bourque in 1950. This property was located on lot 19, range XIV of Cleveland township, it has not produced this 1951 and the land is now cultivated. At Bromptonville there has been no production since World War I.

Near Danville, Georges Bourbeau operated a brick plant until 1937.

RIMOUSKI County.

Ref.: 8, p. 100; office files.

Before the first World War, F. Ringuet operated a small brick plant in the town of Rimouski.

ROBERVAL County.

Ref.: 8, p. 72.

La Briqueterie Mistassini Inc. operated a brick plant in Pelletier township, lot 14, Mistassini concession. The last production year was 1954.

ROUVILLE County.

Ref.: office files.

A. Dionne operated a small brick plant at St. Césaire before World War I.

SAINT-HYACINTHE County.

Ref.: office files.

At St. Judes, a small brick plant was in operation before World War I.

SAINT-JOHN County.

Ref.: 8, p. 75; office files; 12, p. 31.

About one mile next of St. John, Standard Clay Products used a mixture of local clay and imported clay in the manufacture of sewer pipes. The last year of production was in 1962.

On the Richelieu River, 2.5 miles north of the town, Central Pottery Ltd. operated for a few years until the plant was destroyed by fire in 1942.

ST. MAURICE County.

Ref.: office files.

Before world war I, there was a small brick plant in Three Rivers operated by Tel. Dugré.

SHEFFORD County.

Ref.: office files.

Near the town of Granby, Nap. Loiselle operated a brick plant intermittently from the early years of this century until 1936. The plant was rented to Granby Brick Co. for some years and to P.H. Provençal who was the operator at the time of closing.

Another small plant was in operation near Granby on lots 630 and 555 before 1929. It was called Granby Clay Products.

SHERBROOKE County.

Ref.: 8, pp. 89-92; 12, p. 31; office files.

Ascot corner was once a very active brick manufacturing location. Sherbrooke Tile and Brick opened this clay deposit in the early years of this century on lot 28, range I of Ascot township and on nearby lots 27B and 28D, range V of Stoke township. Ascot Tile and Brick Co. Ltd. and later Ascot Brick Reg'd operated the quarry from 1936 to 1949. The plant was then sold to East Angus Brick and Tile who never operated it.

Another active location was near Lennoxville on lot 9, range IV of Ascot township. There the Eastern Township Brick and Tile Manufacturing Co. opened a clay deposit in the early years of this century sold the brick plant to W.E. Loomis in 1917. From 1922 to 1925, the brick plant was operated by The Sherbrooke Brick Co. Ltd and from 1925 to 1928 by the McGrea-Wally Brick Co. Ltd. The last operator was Lennoxville Brick and Tile Co. Ltd. who ceased operations in 1932.

TEMISCOUATA County.

Ref.: 8, p. 99; office files.

Two small plants were in operation before World War I in Temiscouata county; one was near Rivière-du-Loup at St. Patrice operated by Paul Anctil, the other was at Trois-Pistoles operated by Michel Belzile.

TERREBONNE County.

Ref.: 8, p. 57; office files.

Several brick plants were in operation in the vicinity of Ste. Therese and St. Lin in the first decade of this century. The plant of Dominion Brick Co. at St. Lin was the best known. There was also a small operation near the town of Terrebonne known as the Shawbridge Brick Co.

More recently, La Faillencerie de Blainville used local clay at Ste. Thérèse for the manufacture of pottery, the production is intermittent.

WOLFE County.

Ref.: office files.

On lot 32-33, range IV of Garthby township, Fiber and Clay Products built a brick plant in 1960 but was unable to make a success of the venture; a small production was recorded in 1962.

YAMASKA County.

Ref.: 8, pp. 80-83; office files; 12, p. 33.

Most of the clay operations in Yamaska county were near St. François-du-Lac, they were all small plants which have not produced since World War I.

From 1956 to 1966 an attempt was made to use the clay at St. François-du-Lac on lots 374-379 to manufacture lightweight aggregates. The Quebec Lightweight Aggregates Mining Corp. acquired the property from Sorel Clay Products in 1956 and had a small output in 1959, 1960 and 1962 under the name of Featherock.

KAOLIN CLAYS

Ref.: 11, p. 79; 8; 1, p. 9; office files.

Kaolin clays are known to occur in the following locations:

ARGENTEUIL County, Arundel township, lots 27, 28, range VIII.

A few hundred tons were mined from this deposit from 1942 to 1944 and was delivered to Laurentian Art Pottery at St. Jerôme. The deposit consists of kaolin in a granulated quartzite and occurs in lenses as well as in disseminations and fillings between quartz grains.

GATINEAU County, Blake township, lots 21 to 23, range VIII.

Considerable development work was done on this deposit in 1942 by Société Minière Gatineau Enrg. The kaolin deposit is crescent shaped, its length is 900 feet and its maximum width is 106 feet, one drill hole found the thickness to be at least 300 feet. The main trouble is that

the deposit lies almost totally under Thirty-One Mile Lake.

LABELLE County, Joly township east side of Lac Labelle.

No development work was done on this deposit.

MONTMORENCY County, Côte-de-Beaupré seigneurie, near Château Richer.

Kaolinised anorthosite containing 20% kaolin. Extent and tonnage of deposit is not known.

NEW QUEBEC, SHEFFERVILLE, township no. 3956.

Kaolinite clays occuring in lenses associated with iron ore deposits of Iron Ore Co. of Canada.

PAPINEAU County, Amherst township, lots 4, 5, 6, and 12, range VI S.

These deposits have been in operation intermittently between 1912 and 1923, continuously between 1931 and 1948 and again intermittently from 1953 to recent. During this rather long history, six different operators were active and have produced a total of 12,000 tons of kaolin and more than 150,000 tons of silica. The present owner is Laurentian Silica Mines Ltd. The kaolin occurs in lenses in a kaolinised quartzite or disseminated in the quartzite surrounding individual grains of quartz as a thin film.

DIATOMITE

Diatomite, also called diatomaceous earth kieselguhr, infusorial earth or tripolite, is a siliceous sedimentary material, more or less consolidated, which was formed by the accumulation of diatoms in fresh or marine waters. When dry, it is a very light material wheighing 20 to 40 lb. per cu. ft.

The Quebec occurrences are in bogs or lake bottoms and usually contain large amounts of clay and organic matter; calcination may be necessary to distinguish the diatomite from ordinary peat. The important deposits of the world are usually in tertiary rocks probably because of favourable climatic and salinity conditions prevailing at that time.

Diatomite is in demand because of certain unique properties. It is used in filtration because it is inert, very porous, and gives a clear filtrate at a rapid rate. It is a good heat insulator because of its low thermal conductivity. Its unique microscopic structure, its reactivity or inertness depending on use, makes it a good mineral filler in paints, paper, insecticides, plastics, asphalts, fertilizer and many other fields. Its power of absorption is made use of in chemical desinfectants, dynamite, solidified fuels and in the purification of acetylene gas. Diatomite is used as a carrier for catalysts in hydrogenation and many other chemical processes. The low density and relative high strength is taken advantage of in the manufacture of structured materials such as brick, block, tile or board. Because of its relative hardness, it is often used as a mild abrasive in metal polishes. One of the main uses in Canada is in the manufacture of pozzolan cement because of the reactive properties of diatomite.

The Quebec occurrences of diatomite are generally in swamps or in the bottom of lakes, they are sometimes of good quality but their small size has prevented their development.

Principal References

(1) Eardley-Wilmut, V.L. Diatomite, its occurrences, preparation and uses. Can. Mines Br., publ. 691, 185pp., 1928.

(2) Bulletin on infusorial earth: G.S.C., publ. no. 857, vol. XV, pt. S, 1904.

(3) Mining Operation in the Province of Quebec.

(4) Office records.

LIST OF OCCURRENCES

BOURG-LOUIS Seigniory, Portneuf county.

Range V, near St. Leonard Station on Jacquot River.

Ref.: 1, p.93; 4 (C. Faessler) 1946.

Diatomite deposit one foot thick over a few square yards. Of scientific interest only because of high percentage of "Fragilaria", a unique occurrence in North America-Analysis: SiO_2, 72.12%; Al_2O_3, 14.33%; Fe_2O_3, 2.51%; CaO, 1.10%; MgO, 0.88%; L.O.I., 3.08%.

CHERTSEY Township, Montcalm county.

Range IV, lot 5.

Ref.: 4, (P.E. Bourret, 1943).

Two to six feet of grey diatomite covering an area of 1,500 feet by 500 feet at the bottom of Lake Du Seize. The diatoms are generally shattered causing excessive fines. Analyses of 7 samples taken at various points from the lake bottom:

SiO_2	L.O.I.	SiO_2	L.O.I.
76.43%	13.35%	68.42%	17.72%
80.12%	15.45%	78.05%	14.43%
77.45%	17.06%	79.10%	13.99%
73.49%	21.93%		

Range V, lot 16.

Ref.: 1, p.79; 2, p.28.

Diatomite deposit under a swamp at the east end of lake Michel, was used around the turn of the century for white washing houses and barns. The deposit covers about 4 acres and the thickness is one to two feet under 6 inches of moss. Analysis:
SiO_2, 77.06%; Al_2O_3, 8.50%; Fe_2O_3, 1.20%; CaO, 1.32%; MgO, 0.73%; L.O.I., 10.10%.

COLBERT Township, Portneuf county.

Range IV, lot 43.

Ref.: 1, p.80; 4 (C. Faessler 1946).

Two to six feet of pure white diatomite covering an area of about two acres at the bottom of a pond north of Lake Simon.

	Average Sample	From bottom, Iron stained
SiO_2	79.80%	64.50%
Al_2O_3	5.44%	10.92%
Fe_2O_3	1.30%	3.64%
CaO	0.48%	1.10%
MgO	0.22%	1.13%
L.O.I.	11.64%	18.00%

COTE DE BEAUPRE Seigniory, Montmorency county.

Ref.: 1, p.93; 2, p.27.

In 1903, a diatomite occurrence was reported at the junction of Bras and Montmorency rivers. The deposit has been washed away by erosion.

EGAN Township, Gatineau county.

Range IV, lot 73.

Ref.: 4 (Aubert de la Rue, 1940).

Light coloured diatomite deposit of unknown extent and thickness. This deposit lies near the west shore of Lake Sec, 3 miles north of Montcerf; the local inhabitants have been using it for years for domestic purposes like polishing knives and cleaning windows. Analysis: SiO_2, 78.92%; Fe_2O_3, 5.02%; Al_2O_3, 6.89%; CaO, 1.02%; MgO, 0.38%; L.O.I., 7.19%.

GOSFORD Township, Portneuf county.

Range VIII, lot 2.

Ref.: 1, p.93; 4 (C. Faessler 1946).

About two feet of diatomite exposed along a small brook. Analysis: SiO_2, 75.50%; Al_2O_3, 7.07%; Fe_2O_3, 1.73%; CaO, 2.53%; MgO, 0.88%; L.O.I. 12.46%.

LAMBTON Township, Frontenac county.

Range A, lot 25.

Ref.: 4 (G.W. Waddington, 1945).

Two to 4 inches of diatomite covered with two feet of black mud. The diameter exposed is about 10 feet.

LANAUDIERE Seigniory, Maskinongé county.

Two miles north of St. Justin

Ref.: 1, p.93; 2, p.27.

Reported occurrence on top of 60-foot sand bank above creek; now completely washed away by erosion.

MORIN Township, Terrebonne county.

Range III, lot 52.

Ref.: 4 (P.E. Bourret, 1955).

White diatomite deposit of unknown dimensions on the shore of lake Vert.

SHAWINIGAN Township, St. Maurice county.

Near Shawinigan

Ref.: 3, 1901, p.35.

Locality mentioned.

STONEHAM Township, Quebec county.

Lot 69, Stoneham municipality.

Ref.: 3, p.35.

Locality mentioned.

WESTBURY Township, Compton county.

Exact locality unknown.

Ref.: Cat. Col. and Ind. Exhibit, London, 1886, p. 159.

This diatomite is said to have been used to make polishing powders.

WEXFORD Township, Terrebonne county.

Range V, lot 22.

Ref.: 1, p.93.

About 4 acres along south edge of lake Castor is covered by several feet of diatomite mud underlain by grey diatomite.

FELDSPAR AND FELDSPATHOID

Feldspar is the most abundant mineral in the earth's crust since it is the main constituent of igneous rocks which are themselves more abundant than the sedimentary rocks. Because of their almost universal presence in igneous rocks, feldspar minerals are used to classify them.

Pegmatites and aplites generally contain a high percentage of feldspar and they are thus the main source of the mineral. Pegmatites and aplites usually occur in dykes or irregular masses the former crystallising in the presence of abundant mineralizers which have promoted the development of large crystals while in the aplite the grain is fine and the texture is often sugary.

In composition the feldspars are essentially made of silica, alumina and of one or more oxydes of sodium, potassium or calcium. Orthoclase and microcline are the potassium feldspars, the plagioclases form an isomorphic series containing a mixture of various proportions of lime or soda; the sodic end member is called albite and the calcic end member is called anorthite; in between the minerals are called oligoclase, andesine, labradorite and bytownite.

When a magma crystallises with an excess of soda and a deficiency in silica, the feldspathoid nepheline may develop in great abundance. The resulting rock will be a nepheline syenite or a phonolite or a nepheline basalt. This rock is favored over feldspars from pegmatites by many ceramists principally because of its higher content of alumina and its occurrence in large minable masses.

The two main requirements of a feldspar or nepheline syenite deposit is that it be very uniform in composition and that impurities such as iron oxides be very low.

Feldspar and nepheline syenite are used mainly in the manufacture of glass and ceramics especially because they act as fluxing agents lowering the temperature of fusion considerably, they impart strength, toughness and durability to the finished product and also because they provide alumina to the batch. A typical glass batch contains 72% SiO_2, 15% $Na_2O + K_2O$, 10% $CaO + MgO$, 2% Al_2O_3, and 1% other oxides. Silica sand sells at much lower prices than aluminous materials and alkalies and therefore a high percentage of these ingredients in the feldspar or nepheline syenite is desirable. One can also see how important it is to have a uniform composition in the feldspar or nepheline syenite which provides silica, alkalies and some lime in addition to alumina to the glass batch; a slight difference in composition will change considerably the calculations of the batch.

Other ceramic products in which feldspar and nepheline syenite are used include whiteware and porcelain bodies as well as glazes, protective enamels for metal and electrical insulators. Dental spar is a very high grade potash feldspar usually selected by hand in the deposit or on the cobbing line.

Feldspar is also used as an abrasive, as a decorative ingredient in artificial stones and stucco walls, in roofing granules, as poultry grit and as a filler in paints and rubber.

For all these purposes, feldspar and nepheline syenite require to be ground very fine except in the manufacture of glass where the upper size limit is 20 mesh, for whitewares, glazes and enamels; the specifications are usually minus 120 mesh and as fine as minus 325 mesh. Depending especially on the size of the finished product, the prices may vary from $9.00 perton to $23.00 at the North Carolina mines according to E. & M.J. quotations for July 1967.

PRINCIPAL REFERENCES

(1) Feldspar in Canada: Can. Mines Br., 125pp., 1916, by H.S. De Schmid.

(2) Canadian feldspar in 1922: Can. Mines Br., Sum. Rept. 1922, 21-32pp., by V.L. Eardley-Wilmot.

(3) Report on the feldspar deposits of the Quetachou Manicouagan Bay: Que. Dept. Col. Min. Fish., Rept. Min. Oper. 1924, 93-111, 1925, by W. Erlenborn.

(4) Feldspar: Can. Mines Br., publ. 731, 145pp. 1932, by H.S. Spence.

(5) Mining Operations in the Province of Quebec

(6) Quebec Bureau of Mines

(7) Mining Industry of the Province of Quebec.

(8) Office records

(9) Report of the Commissioner of Crown Lands.

LIST OF OCCURRENCES

ABERFORD Township, Pontiac County.

Range I.

Ref.: 7, 1937, p. 111; 1940, p. 82.

W.J. Borr produced a small quantity of feldspar from this deposit in 1937 and 1940.

ARUNDEL Township, Argenteuil County.

Range IV, lot 25.

Ref.: 4, p.62; 6, (1936 pt.C) p.23.

This deposit was worked in 1926 by A. Larose and a small production was recorded. A segregation of pegmatite in the granite of the Morin Series; the feldspar is red and is associated with some plagioclase and ferruginous minerals.

AYLWIN Township, Gatineau county.

Range VIII, lots 47-48.

Ref.: 4, p.62; 5 (1932) p.42.

The McArthur Mine

This deposit was opened in 1921 by G. Masson who sold it in 1924 to Orford Soap Company which later became the Bon Ami Ltd. A white spar, high in soda was produced continuously until 1935 for use in scouring soap. The feldspar zone averages 20 feet in width.

BARIL Township, Laviolette county.

About 7 miles from the confluence of the Wessonneau and St. Maurice rivers.

Ref.: 8, (M. Bayer) 1933.

Pegmatite dyke about 200 feet wide of unknown length. Crystals up to eight feet long, very clean, of predominantly potash feldspar. The proportion of quartz to feldspar in observed portion of the dyke is about 3 : 1.

BEAUPRE (Côte de) Seigniory, Montmorency county.

Near Château Richer. Cadastral lots 427, 428, parish of l'Ange Gardien

Ref.: Can. Dept. Mines I.R. 60-113.

Altered anorthosite containing about 20% kaolin, 70% plagioclases and 10% mica, potash feldspar and impurities. The plagioclase is about half and half albite and anorthite. Ceramic tests were made in 1960 on this material at the Department of Mines in Ottawa and it was found suitable for use in ceramic whiteware although calcium feldspar is not usually regarded as a good ingredient for such a use because of the higher fluidity of the resulting glass.

BERGERONNES Township, Saguenay county.

Blocks G and H.

Ref.: 1, p.48; Que. Dept. of Mines P.R. 166, p.12; 8 (P.E. Bourret 1942).

These deposits have been worked for muscovite in the 1890's. The McGie mine in Block G has a pegmatite body some 25 to 70 feet wide and over 500 yards in length. In 1940, Eugène Simard discovered a mica bearing pegmatite a few hundred feet south of block H and sold more than 10,000 pounds of the mineral. In 1953, Strategic Materials worked a feldspar-mica deposit in the same vicinity, they drilled nine holes and outlined a pegmatite body some 200 feet wide and 2,000 feet long. The feldspar (plagioclase) crystals may measure three feet in diameter and more, no feldspar from this deposit was sold.

BOISCLERC Township, Temiscamingue county.

Ref.: 5 (1923) p.67.

This locality is mentioned as having been prospected for feldspar in 1923.

BOUCHETTE Township, Gatineau county.

Range VII, lot 10.

Ref.: 1, p.30.

This deposit was worked around 1910 by Mr. Côté of Ottawa, but no production was recorded. The dike like body has an average width of 35 feet and a minimum length of 500 feet. Pure spar occurs within a mass of graphic granite containing from 10 to 20 per cent quartz.

BRASSARD Township, Berthier county.

Range I, lot 13.

Ref.: 8, 1954.

Joseph Brassard drilled two holes on a feldspar and quartz deposit in 1954. Part of the core was white feldspar, the rest was a mixture of quartz and feldspar.

BUCKINGHAM Township, Papineau county.

Range I, lots 7, 8.

Ref.: 8.

B.A. McDonnell worked a feldspar deposit on these lots in the thirties, no production was reported.

Range II, lot 6.

Ref.: 8.

H. & A. Burke did some stripping on a feldspar deposit in 1956.

Range II, lot 14E.

Ref.: 8.

Property of Feldspar Quarries Limited which was liquidated in 1963.

Range II, lot 15.

Ref.: 8.

W.H. Evans and B.A. McDonnell produced some feldspar from this deposit in 1939-40.

Range III, lot 1.

Ref.: 7 (1943) p.52.

The Wallingford mine produced a small tonnage of feldspar in 1943.

Range IV, lots 14, 15, 16.

Ref.: 4, p.65; 8 (A.O. Dufresne, 1924).

Two pegmatite dykes having widths of 125 and 275 feet respectively with considerable quartz and potash feldspar. The Electric Reduction Company worked these deposits around 1910 and extracted a small tonnage of feldspar.

Range V, lots 17, 18.

Ref.: 7 (1947), p.39.

The Smith mine operated by Bon Ami Ltd. in 1947; the feldspar was shipped to the grinding plants of the Canadian Flint and Spar Company at Buckingham and of the Orford Soap Company, Manchester, Connecticut.

Range V, lot 21.

Ref.: 4, p.66.

This deposit was worked in 1923 by Mr. H. Dickson who shipped a few cars of quartz and spar.

Range VI, lot 19.

Ref.: 8 (P.E. Bourret, 1953).

Canadian Flint and Spar Company owned a feldspar deposit on this lot which has never produced.

Range VI, lot 22.

Ref.: 7 (1940) p.21; 4, p.66.

In 1940, Bon Ami Ltd. did some development work on this deposit and shipped a small tonnage to its plant at Pointe-aux-Trembles near Montreal.

Range VI, lot 23.

Ref.: 4, p.66.

A dyke was stripped over a length of 75 feet showing a width of 15 feet. It consists of graphic granite with zones of clean spar. Many impure zones containing mica, tourmaline and other iron bearing minerals are present in the dyke. No production was reported by the Ottawa Valley Mines Ltd. who did the development work in 1929.

Range VII, lot 8.

Ref.: 7 (1945, p.34; 1946, p.33).

This deposit known as the McLemments Mines contains high-potash as well as high-soda spar, and some dental spar. Small productions were recorded in 1940, 1945 and 1946. The last operator was Buckingham Mining Corporation.

Range VII, lot 19-B.

Ref.: 8 (P.E. Bourret, 1953).

In the south part of lot 19, an aplite dyke some 35 feet wide consists of microcline and graphic quartz, the latter mineral constitutes about 10% of the rock. Impurities are low. In 1953, Percy Valley of Buckingham sold about 1,200 tons of this rock to Canadian Flint and Spar Co. of Buckingham. This property is now covered by Mining Concession no. 414.

Range VII, lot 21 S1/2

Ref.: 8 (M. Boger, 1930).

This deposit consisting of large crystals of orthoclase and quartz was opened in 1930 by J.B. Gauthier. The feldspar constitutes about 60% of the rock and is easily detachable from the quartz. Small shipments were made in 1930 to Electric Reduction Co. in Buckingham.

Range VII, lot 22.

Ref.: 7 (1940), p.21.

Some development work was done in 1940 by Bon Ami Ltd.

Range VII, lots 23, 24.

Ref.: 5 (1933) p.38.

Some development work was done on these deposits in 1933 by W.H. Evans. In 1939-40, William Cameron produced a small tonnage from lot 24.

Range VIII, lot 8.

Ref.: 8 (P.E. Bourret, 1954).

A pegmatite dyke uncovered over a distance of 75' and a width of 20 feet consists mostly of quartz with micropegmatite containing pink microcline. No production was recorded from this lot.

Range VIII, lot 9.

Ref.: 4, p.66; 5, (1928) p.54.

Mr. T. Whitfield shipped about 100 tons from this deposit in 1925 and in 1928 he did some development work on the same dyke of red spar.

Range VIII, lot 27.

Ref.: 8 (P.E. Bourret 1952).

On this lot there were several exploitations at different times. The feldspar is usually associated with quartz and sometimes with biotite. In 1940, Bon Ami Ltd. worked one deposit for feldspar as well as quartz; in 1946 the company opened three other pits and was shipping a car of feldspar every two days from what was called the Green Lake Mine. In 1952, production resumed for a short while from a deposit which was called the Mathewman feldspar mine.

Range IX, lots 3, 18, 19.

Ref.: 8.

These lots were worked by Percey Valley who reported a small production in 1954-1955.

Range IX, lot 11.

Ref.: 4, p.66.

Mr. J. Cameron mined feldspar and quartz from this lot in 1922. In 1925, Mr. Devenaugh produced about 50 tons of spar.

Range IX, lot 16.

Ref.: 7 (1942, p.27); (1943, p.52); 1944, p.53).

Guy Bigelow opened this mine around 1940 and in 1941 leased the property to Unived Mining Industry who produced regularly from 1941 to 1946. In 1946 and 1947, the mine was operated by Buckingham Mining Corp. In addition to white feldspar, this deposit has yielded large tonnages of dental spar.

Range IX, lots 27, 28.

Ref.: 4, p.66; 5 (1940, p.21); 7 (1943, p.51); 7 (1944, p.32); 7 (1945, p.34); 7 (1946, p.33); 8 (P.E. Bourret, 1937).

The Cameron or New York Mine

This pegmatite dyke was traced over a length of 1,000 feet and is over 200 feet in width at places. It was opened in 1926 by Mr. W. Cameron who sold it to New York Feldspar Corporation shortly after. In 1929, the mine became the property of Consolidated Feldspar Corporation of Trenton, N.J. A total of 17,000 tons of feldspar was shipped from this mine between 1926 and 1930. Due to the lack of adequate haulage facilities, mining was discontinued until 1936 when the Quebec Bureau of Mine rebuilt the roads leading to the mine. W.E. Evans and Reginald Cameron extracted feldspar between 1936 and 1939. After a few years of inactivity, operations resumed in 1942 under the direction of Canadian Flint and Spar who reported production from 1942 to 1946. The dyke has a central core 20 to 30 feet wide composed almost exclusively of white potash feldspar; this core is flanked by zones of feldspar and quartz intergrowths, pyrite crystals are abundant.

Range X, lot 5.

Ref.: 4, p.67

Worked in 1923 by Messrs. Maloney and Rich of Ottawa. Buff-coloured spar with quartz stringers.

Range X, lot 8.

Ref.: 4, p.67.

Narrow pegmatite dyke mined especially for quartz in the twenties.

Range X, lot 25.

Ref.: 8.

Development work done by Buckingham Feldspar Inc. in 1945 and 1946.

Range X, lot 27.

Ref.: 7 (1943) p.52.

The Perkins Mine was worked intermittently in 1943.

Range X, lot 27-B

Ref.: 7 (1946) p.33.

The Green Lake mine was worked in 1946 by the Bon Ami Ltd.

Range X, lot 28-A

Ref.: 8 (1958).

Buckingham Feldspar Inc. and Templeton Development Co. studied these dykes in 1952 and 1957. Three dykes two of which were traced by pitting for lengths of 250 feet and 200 feet respectively contain good feldspar, a certain percentage of which is dental.

Range XI, lots 7, 8.

Ref.: 7 (1949, p.46).

Henry Casey and Anthony Burke did development work in 1949 on a pegmatite outcroping over a length of 400 feet with maximum width of 100 feet. The high potash green feldspar core of the dyke measures about 15 feet, it is flanked by micropegmatite with bands of soda-spar. Production from this deposit was recorded from 1951 to 1959.

Range XI, lot 9.

Ref.: 4, p.67; 5 (1928, p.54).

Edmond Couture shipped some feldspar from this deposit from 1923 to 1928 intermittently and in 1938, Jos. Wallingford reported a small production. The dyke consists of an intimate mixture of quartz and feldspar with impurities of hornblende and titanite.

Range XI, lot 14.

Ref.: 8 (1940).

A pegmatite dyke exposed over length of 250 feet and width of 40 feet in N.E. quarter of lot. No production recorded.

Range XI, lot 25-A.

Ref.: 7 (1947, p.39).

Feldspar Products Inc. reported a small production from this lot in 1947 and 1948.

Range XI, lot 27.

Ref.: 4, p.68.

A dyke 25 feet wide exposed over 100 feet in length contains feldspar almost exclusively but the mineral has a dirty red colour.

Range XI, lot 28.

Ref.: 4, p.68.

A pegmatite dyke outcroping over length of 400 feet with maximum width of 125 feet. Granitic intergrowth of pink spar and quartz with zones of large spar crystals. No production recorded.

Range XII, lot 13.

Ref.: 4, p.68; 8 (A. Deland, 1957).

Messrs. Maloney and Rich opened a pit in 1923 on a dyke consisting of buff coloured potash spar and greenish white soda spar, some pyrite is present but little quartz. In 1947, a small production was reported from this lot by Ella Valley. Another deposit was worked in 1957 by Adéodab Malette on a dyke exposed over a length of 400' and width at one place of 50 feet. The feldspar in this working is white and pink, the intergrown quartz represents about 35% of the rock.

Range XII, lot 14 E 1/2

Ref.: 4, p.68; 8 (P.E. Bourret, 1938); 7 (1943, p.52).

The Pedneaud Mine.

This mine was opened around 1910 by G. Pedneaud who extracted mostly quartz and some feldspar until 1937; the mine was then passed on to Louis Pedneaud who operated it two years and sold it to Henri Morin in 1941; the latter operated the mine until 1945; from that year, the mine was operated intermittently by Laroche & Hébert, Buckingham Cartage Reg'd and by François Charette until 1961. The Pedneaud Mine is one of the best known in the Buckingham district. The dyke is exposed over a length of 1500'

varying in width from 20' to 125'; the proportion of quartz to feldspar is 3 or 4 to 1. In 1937, Mathias Laviolette opened another deposit of feldspar near the Pedneaud Mine, the production was very small.

Range XII, lot 15 E 1/2

Ref.: 1, p.32.

In 1910, C. Pellneau worked a deposit of feldspar on this lot and shipped a few loads of spar.

Range XII, lot 20.

Ref.: 7 (1942, p.27).

The Betty mine was active in 1942. No production was recorded.

Range XII, lot 21.

Ref.: 4, p.70; 5, 1928, p.54.

R.J. Donaldson mined a few tons of spar from 1926 to 1928 from a narrow dyke containing a buff spar and some scattered books of mica. A small production was also recorded in 1939-40.

Range XII, lot 22.

Ref.: 8.

Production from this lot was reported by Wilfrid Donaldson in 1964-65.

Range XII, lot 24.

Ref.: 4, p.70; 5 (1928, p.54).

Winning & Elliot worked this deposit between 1925 and 1928. The clean spar exempt from intimately mixed quartz or black mica is rare.

Range XII, lot 25.

Ref.: 7, (1943, p.52).

Small shipments of spar were made in 1943 from the Betty Mine located on this lot.

Range XII, lot 26.

Ref.: 7, p.97.

J. Cameron prospected this deposit in 1926. Considerable mica with white spar in a small dyke.

CAMPBELL Township, Labelle county.

Range I, lots 17, 18, 19.

Ref.: 7, p.65; Dept. of Mines, Quebec, G.R. no. 23, p.50.

Some development work was done in 1930 by Phrase Arbic who shipped a few hundred tons between 1932 and 1938. The dyke can be traced over a length of 1,500 feet and is 12 to 15 feet wide. It carries white spar with some admixed pink and buff.

Range IV, lots 23, 24, 25.

Ref.: Dept. of Mines, Quebec, G.R. no. 23, p.50.

This dyke measures 300' in width at places. It contains mostly pink potash-feldspar and quartz in graphic intergrowths; some tourmaline is present.

CHICOUTIMI Township, Chicoutimi county.

Range VII, lot 14.

Ref.: 8, (P.E. Bourret, 1951)

This feldspar deposit was worked in 1929-30 by Henri Bouchard and Jos. Fortin. The pegmatite dyke is opened in a single pit where it measures 19 feet in width. It consists of successive bands of micropegmatite, feldspar and quartz mixture, vitreous quartz and microcline which is quite pure except for a few veinlets of quartz.

DE MAISONNEUVE Township, Berthier county.

Range II, lots 1, 2W 1/2,

Range III, lots 1, 2E 1/2.

Ref.: 1, p.44; 8 (P.E. Bourret, 1942).

This deposit known as the Maisonneuve Mine, was discovered in the early 1880's and was principally regarded as a source of mica. Later, the presence of samarskite attracted attention especially during and after world war II. A small quantity of muscovite was extracted in 1940 by C.J. Dweyer & J.A. Massicotte.

The pegmatite dyke is exposed over a length of 200 feet along which it varies in width from 30 to 50 feet. It consists of quartz, microcline, plagioclase, muscovite, biotite, garnet, tourmaline, iron sulphides and a little samarskite. The feldspar could not be mined as a single product because the masses are small and the impurities very abundant, some good crystals could be extracted as a by product if another constituent of the dyke proved to be of economic value.

DERRY Township, Papineau county.

Range I, lot 2.

Ref.: 5 (1926) p.49.

Some feldspar was extracted from this lot at various times between 1926 and 1941 first by Alfred Parcher then by Canadian Flint and Spar Co. Ltd.

Range I, lots 7, 8.

Ref.: 4, p.70.

The Derry Mine

This mine was opened in 1920 by Messrs O'Brien & Fowler who were incorporated under the name of Canadian Flint and Spar in 1930. This company sold its assets to International Minerals and Chemical Corp. in 1953. The mine was in almost continuous operation until 1942 when it was allowed to fload. Different operators including Gordon Bigelow, Alton Parcher and B.A. McDonnell operated the mine for Canadian Flint and Spar. In 1949, Gordon Bigelow acquired the property and continued operations on a small scale. Since 1964, the mine was operated intermittently by François Charette; at last report (Sept. 1969) the mine is to be reopened by International Minerals and Chemical Corp.

The feldspar dyke is 150 feet wide and more than 350 feet long. Clean spar was extracted from a 50 foot strip on the west wall, the rest of the dyke is mixed granite. Dental spar constitutes a certain proportion of the ore and in 1941 more than 50 tons monthly were being sold.

Range I, lot 9.

Ref.: 5, (1933) p.38.

Some feldspar was taken from this lot in 1933 and again in 1941.

Range I, lot 11.

Ref.: 4, p.72; 8, (P.E. Bourret, 1955).

This deposit was worked by Alfred Parcher from 1920 and was active intermittently until 1943 when United Mining Industries Ltd. operated the mine. In 1948, the mining rights were acquired by the Buckingham Mining Corporation. The pegmatite dyke is about 30 feet wide and is exposed over la length of 150 feet, it consists of massive quartz with large crystals of soda spar and potash spar. The walls of the dyke are micropegmatite and graphic granite.

Range I, lot 12.

Ref.: 5 (1923) p.67.

Prospecting and development work was done for feldspar on this lot in 1923.

Range I, lot 13 N1/2.

Ref: 4, p.72; 8 (P.E. Bourret, 1945).

This deposit was opened in 1922 by A. Parcher who worked it intermittently until 1930. In 1939, Maggie Parcher becomes the owner and some mining is carried out first by Alton Parcher and Walter Sellers until 1941 and by A.R. Whitmore from 1944 to 1947. The dyke lying near the north shore of Whittaker Lake is exposed for 70 feet in length and is opened by an excavation measuring 30 x 30 feet and 25 feet deep. Scattered crystals of buff or bluish-white potash spar and some soda spar occur in a mass of quartz. Two other dykes were found on this lot 650' and 1,000' respectively to the north during exploration in 1939.

Range I, lots 15, 16.

Ref.: 5 (1926) p.48; 8 (P.E. Bourret, 1955).

O'Brien & Fowler shipped feldspar from lot 15 in 1926. A flat lying N.S. dyke exposed in an open pit 25 feet long and 20 feet wide containing small pockets of white feldspar in quartz and much biotite. On lot 16, 300 feet S.E. of the preceding, another pegmatite has been worked showing some clean feldspar. A third showing of pegmatite is present 80 feet south-east of the preceeding and consists of soda spar, rusty quartz and some biotite. Exploration was done on these lots in 1955 by Michael McKinnon.

Range II, lot 2.

Ref.: 8 (A.O. Dufresne, 1924).

Four dykes were observed on this lot consisting mostly of graphic intergrowths of feldspar and quartz with impurities of biotite and tourmaline. The largest of these dykes measure several hundred feet long and varies in width from 35' to 90'.

Range II, lot 3.

Ref.: 4, p.72.

This deposit was worked in 1930 by Henri Mercier, the dyke is 20 feet wide and consists of red spar mixed with massive quartz and much tourmaline.

Range II, lots 9, 10, 11, 12.

Ref.: 4, p.72; 7 (1939) p.34; 8 (O.D. Maurice, 1966).

These mines were known as the Higginson and Parcher Mines on lot 10 and the Bertrand Mine on lot 11. Intermittent operations started in 1921 and lasted until 1951 in the northern half of these lots. Mr. Venard Bigelow has mined one deposit on lots 11 and 12 in 1964-65 producing

some 800 tons which were sold to Canadian Flint and Spar. There are at least five known occurrences of feldspar occurring in lenses varying in width and length from a few feet to several hundred feet. The feldspar is generally mixed with quartz and there are impurities of tourmaline and mica but large crystals of white and pink feldspar are present.

Range II, lot 14.

Ref.: 5 (1930) p.36.

Feldspar is said to have been mined on this lot in 1930 by Mr. Bert MacDonald.

Range II, lot 15.

Ref.: 4, p.73; 8 (P.E. Bourret, 1937).

This mine was known as the Wallingford mine for many years. It was opened in 1924 by Messrs O'Brien and Fowler who shipped some 3,000 tons of feldspar per year until 1930. The mine was reopened in 1937 after road improvement and was operated almost continuously ever since by Canadian Flint and Spar and by International Minerals and Chemical Corporation Ltd. from 1955. For some years it has been known as the Back mine. The present opening (Sept. 1969) makes a very impressive site extending from an adit to a depth of more than 150 feet in depth, pillars hold the roof which has been pierced by raises in the course of mining operations. The deposit now nears exhaustion but has furnished a great tonnage of excellent feldspar and quartz. A section across the width of the dyke shows a central core of quartz, flanked by white feldspar and mixed pegmatite near the walls. The pegmatite body dips 45° to the south-west and the hanging-wall side has furnished the greater quantities of feldspar.

Range II, lot 16.

Ref.: 8 (P.E. Bourret, 1949).

White potash feldspar with many quartz and biotite inclusions. This prospect was worked in 1949 by Odias Gauthier.

Range III, lot 1.

Ref.: 5 (1937, p.39)

This deposit was the property of Perkins Mining Co. who mined some feldspar at this location in 1937.

Range IV, lot 6.

Ref.: 4, p.73

In 1928, Mr. W. Bertrand reported a production of 150 tons of white spar from this deposit.

Range IV, lot 7.

Ref.: 8.

This deposit was worked intermittently by Earl Parcher from 1956 to 1958.

Range V, lot 1.

Ref.: 4, p.73; 8 (P.E. Bourret, 1938).

Mr. E.M. Lapointe opened this deposit in 1925 and feldspar was extracted intermittently until 1936 by Perkins Mining Co. and by Derry Mining Co. In 1938, Arthur Wallingford and Jules Cornu applied for a mining concession on the northern part of the lot, this concession, no 303 was

revoked in July 1969. A pegmatite dyke 250 feet long and about 40 feet wide contains potassium feldspar over a length of 100 feet and a width of 20 to 30 feet. More than 8,000 tons of feldspar were mined from this deposit.

Range V, lots 19, 20.

Ref.: 7 (1946, p.33).

Development work was carried out on this deposit in 1946 and 1947 by Canadian Flint and Spar Co. Ltd.

Range VII, lots 11, 12.

Ref.: 7 (1946, p.33); 8 (P.E. Bourret, 1963).

This deposit was opened in 1936 by Frank Toutloff, in 1940 it was acquired by Henry Burke and in 1946 by Earl Parcher. Canadian Flint and Spar did some development work in 1946 and Earl Parcher continued development in 1948; the latter abandonned the property in 1954. In 1963, François Charrette acquired the mining rights and did more development work.

The opening measures 30 feet by 20 feet and is about 20 feet deep. White microcline mixed with quartz characterizes the deposit and a certain percentage of dental spar is present. More work would have to be done to evaluate this deposit.

EARDLEY Township, Gatineau county.

Ranges VI, VII, VIII, lot 1.

Ref.: 4, p.63; 8 (M. Boyer, 1931).

A pegmatite dyke some 80 feet wide and striking N 45°W contains a mixture of potash and soda spar with considerable silica and some iron stains. It was worked in the twenties by the Eureka Flint and Spar Company who leased the property for a short period to Canadian Flint and Spar in 1931. The deposit is said to be very large but exploitation was discouraged by the presence of iron stains and the great amount of graphic granite.

EGAN Township, Gatineau county.

Range IV, lots 47-51.

Ref.: G.R. no 23, p.49; Dept. of Mines, Quebec.

Many pegmatite dykes cutting through gneiss on the left bank of the Desert River.

GRAND CALUMET Island, Pontiac county.

Range IV, lots 7, 8; Range XI, lot 1; Range XII, lot 1.

Ref.: 5 (1898, p.43); G.R. 18, p.28, Department of Mines, Quebec.

Numerous pegmatite dykes were seen by F.F. Osborne who mapped the area in 1943. J. Obalski also mentions occurrences of feldspar on the Island in 1898.

GRENVILLE Township, Argenteuil county.

Range II, lot 27.

Ref.: 4, p.94.

A.R. Lanigan worked a small pegmatite dyke in 1917. Many dark impurities mixed with red spar.

HULL Township, Hull county.

Range IX, lot 13.

Ref.: 1, p.32.

The deposit was mined by Mssrs. Tailor, Arnoldi and Bowie in 1898; about 8 carloads were shipped. It is a narrow deposit of light brown or greyish microcline mixed with quartz but with zones that are free of quartz.

Range X, lot 5.

Ref.: 1, p.33.

Worked in 1896 by J.H. Taylor. Pink microcline traversed by small stringers of quartz with zones of relatively pure feldspar.

Range XI, lot 3.

Ref.: 4, p.63.

Worked in 1927-28 by the Phoenix Stucco Company; a narrow dyke containing dark red spar with large amount of iron bearing impurities. The product was used as stucco dash.

Range XIV, lot 1 N½

Ref.: 4, p.64.

Mr. E. Toutloff worked this deposit in 1929-30. Pink feldspar in quartz exposed in a dyke over 275 feet in length and 50 to 15 feet in width. Small amount of specular iron present in joint planes.

Range XIV, lot 1 S½

Ref.: 4, p.64.

F. Toutloff opened this property in 1929. The deposit consists of a large dyke of pinkish-buff spar in large crystals separated by masses of quartz. Much tourmaline is present with mica, allanite and magnetite in small amount.

Range XIV, lot 5.

Ref.: 4, p.95.

Small amount of work reported by Mr. L. Duquette in 1927. No shipment.

Range XIV, lot 13b.

Ref.: 8.

From 1951 to 1953 Bigelow and Christie reported some work on a feldspar deposit occurring on this lot.

Range XIV, lot 14.

Ref.: 4, p.64; 8 (P.E. Bourret, 1949, 1955).

Mr. A. Wallingford worked two dykes on this lot in 1928-1929, at which time the property was acquired by the Gatineau Feldspar Company. These dykes were located respectively in the north and south halves of the lot. In 1948-50, Mr. Wallingford resumed work on another dyke situated a few hundred feet west of the northern dyke and some 2,250 tons of feldspar were shipped to Consolidated Feldspar Corporation in Rochester, N.Y. A small production was also reported in 1954.

The northern dykes are characterized by the presence of pale green amazonite spar mixed with quartz, tourmaline and some fluorite. The southern dyke consists of pink to buff spar with massive quartz. A small quantity of pyrite gives a rusty appearance to the spar near the surface.

JOHAN BEETZ Township, Duplessis county.

Quetachou Bay

Ref.: 6 (1924, pp. 93-111); 4, p.79; Que. Dept. of Mines P.R. 184, p.17; Que. Dept. of Mines G.R. no. 74, p.48; 8 (P.E. Bourret, 1952).

The feldspar occurrences on the shore of the Gulf of St. Lawrence near Bay Johan Beetz have been a center of attraction since 1889. They were worked in 1912 to 1923 by the Canadian Feldspar Company and Messrs Melkman and Neubauer. In the period between 1922 and 1925 several thousand tons of spar were mined from these pegmatites by Melkman and Neubauer.

The mining operations were not resumed until 1955 when Spar Mica Corporation Ltd., a subsidiary of Strategic Materials and Electro Refractories and Abrasives both of Buffalo N.Y., erected a mill capable of producing 100,000 tons of finished spar per year. A dock to accomodate 10,000 tons cargo ships and a storage building measuring 332 feet by 68 feet having 50,000 tons capacity were also built. The enterprise was not successful and the mill was dismantled in 1961 and sold to Canadian Silica Corporation at St. Canut, Quebec.

There are immense bodies of pegmatite on the east and west shores of Quetachou bay extending in land for several miles. The pegmatites intrude, quartzites, limestones, and amphibolites, they are predominantly of a graphic granite character with zones of clear spar. The main impurities are tourmaline, muscovite, biotite and garnet.

LACOSTE Township, Charlevoix county.

Block A

Ref.: 1, pp. 45-47.

This mine was first worked in 1893 and acquired the following year by the Canadian Mica Company. In 1905, the Canadian General Mining Company of Paris acquired the property and worked it exclusively for mica until 1908. In 1938-39 The Charlevoix General Mining Co. Ltd. did some work on the deposit but no production was recorded.

The pegmatite body dips at flat angles from 0 to 45° N.E., it is 8 to 30 feet thick and can be followed over a length of several hundred feet. Individual large masses of pink orthoclase with patches of white glassy quartz blending into graphic granite characterize the deposit. Albite crystals up to 12 inches in diameter are seen but are not abundant. Biotite and muscovite appear as segregations often intergrown with each other. Accessory minerals include beryl, uraninite and anthraxolite in small quantity, the ash of the anthraxolite contains a remarkable amount of uranium oxide.

MONTCALM Township, Argenteuil county.

Range IV, V.

Ref.: 6 (1936 C, p.24).

These pegmatite occurrences lie south of Bark Lake. They are observed over a distance of some 1,000 feet and widths of four feet at places. The feldspar is potassic and is mixed with quartz and mica.

PORTLAND EAST Township, Papineau county.

Range I, lot 1.

Ref.: 7, (1946, p.33).

A small production was reported by Robert Bigelow and & Sons from this lot in 1946 and 1947.

Range I, lot 2 E½

Ref.: 5 (1933, p.38).

Feldspar deposit worked in 1933.

Range I, lot 3b

Ref.: 8 (O.D. Maurice, 1966).

In 1965, Venard Bigelow mined a deposit of red feldspar on this lot. About 1,000 tons were extracted and sold to International Minerals and Chemical Co. in Buckingham. The dyke measures at least 50 feet wide and can be followed over a length of 500 feet.

Range I, lot 4.

Ref.: 4, p.74; 5 (1922, p.81); 8 (O.D. Maurice, 1966).

This dyke was worked intermittently between 1922 and 1928 by the Laurentian Feldspar Co. In 1966, Venard Bigelow worked another deposit of white feldspar in the northern part of the lot. The old deposit is a narrow structure containing red feldspar mixed with massive quartz. There is no information on the white feldspar dyke worked by Bigelow, it has never yielded any commercial spar.

Range II, lot 3.

Ref.: 5(1930, p.36).

Messrs. Henri Mercier and John Lauzon mined a few tons of spar from this deposit in 1930.

Range III, lot 1a

Ref.: 4, p.74; 5 (1930, p.36)

Messrs. Wallingford and Toutloff mined this deposit in 1930 until 1934; Robert Bigelow reported some production from 1946 to 1959. The deposit consists of a very large dyke of pink spar measuring at least 1,000 feet long and 250 feet in its widest portion. The feldspar is pink and mixed with zones of free quartz, biotite and muscovite are the main accessory minerals.

Range III, lots 10, 11 N½

Ref.: 8 (A.J. Hough, 1955).

In 1955, the McLaurin Feldspar Corporation did some work on pegmatite deposits on these lots. The quartz content is said to be about 10% of the mass. No production is recorded.

Range IV, lot 5.

Ref.: 8 (P.E. Bourret, 1937).

Work was done in 1936 by Camille Marinier on some pegmatite showings within this lot. The pegmatite varies in width from 12 feet to more than 30 feet, two pits were dug on the deposit showing pink feldspar easily detachable from the quartz. Some soda spar is present and crystals of dental spar were observed. Tourmaline and a little rust in the cleavage planes of the feldspar are the main impurities.

Rang V, lot 1.

Ref.: 7 (1946, p. 33).

Bon Ami Ltd. is said to have done some work on this lot in 1946.

Range V, lot 7.

Ref.: 7 (1947, p.39); 8 (P.E. Bourret, 1944).

This deposit is known as the Gratton Mine. It was opened in 1933 by Frank Toutloff who reported a small production for that year. In 1946 and 1947, Bon Ami Ltd. leased the property from A.M. Gratton but no shipment was recorded.

The pegmatite body has been uncovered over a length of 150 feet and a width of 40 feet. Large crystals of white microcline and vitreous quartz easily detachable are present; there are some impurities of muscovite and tourmaline. The deposit lies at the top of a mountain which complicates mining operations.

Range VI, lot 7.

Ref.: 4, p.34.

This deposit was worked mainly for mica in 1909 by Messrs. Watts and Payette. White microcline and albite are seen in association with mica, garnet and other impurities. Crystals of biotite and fluorite and present in vuggs.

Range IX, lots 2, 3 E$\frac{1}{2}$, 32

Ref.: 4, p.75; 5 (1920, p.62).

O'Brien anf Fowler mined feldspar from these lots from 1920 to 1923; Aldias Laviolette reported a small production in 1936 and 1937, and Associated Quebura Mines Limited did some work in 1949 but did not extract any spar. This dyke may be several hundred feet long, but it is not certain wether the two pits opened on the property have encountered the

same dyke. Large crystals of buff to white spar separated by massive quartz.characterize the deposit; some soda spar is present with biotite, muscovite and tourmaline as impurities.

PORTLAND WEST Township, Papineau county.

Range I, lot 3 S½

Ref.: 4, p.75; 5 (1929, p.67).

Maurice Brageau mined feldspar from this lot intermittently from 1923 to 1929. The pegmatite dyke is more than 500 feet long and varies in width from 45 feet to 8 feet. Massive quartz is mixed with the pink spar; some staining is due to the presence of specular iron on some seams.

Range I, lot 13

Ref.: 4, p.74; 5 (1928) p.54.

Mr. M. Lonsdale did some development work on this deposit in 1928-1929. Pink spar with free quartz in a graphic intergrowth characterizes the deposit. The dyke is 20 feet wide and has been uncovered over a length of 60 feet.

Range III, lot 7.

Ref.: 4, p.75; 5 (1925, p.74)

Mr. B. Winning mined some 100 tons of spar from this lot in 1923-1924. The dyke is exposed over a length of 400 feet varying from 20 feet to 4 feet in width. The feldspar is pink to buff coloured and is accompanied by massive quartz. Some large crystals of white soda spar are seen in the wall zones where the dyke changes to a coarse granitic texture.

Range V, lot 2

Ref.: 4, p.76; 5 (1926, p. 49); 8 (P.E. Bourret, 1943)

This is the site of the Lapointe Mine which was opened in 1923 and was operated until 1926 producing about 800 tons of spar. In 1933, The Perkins Mining Co. leased the property from E. Lapointe and reported a small production. From 1943 to 1946 a few thousand tons were mined by United Mining Industries Limited and shipped to Kingston, Ontario and to Rochester, New-York.

The pegmatite dyke is uncovered over a length of 50 feet and a width of 20 feet. The feldspar is brownish-pink microcline, it was found in large masses with very little impurities, other masses contain quartz and some tourmaline.

Range V, lot 6.

Ref.: 7 (1947, p.39); 8 (P.E.Bourret, 1944).

A feldspar deposit was discovered in 1943 on lot 6 by Rodrigue Hart and was sold the next year to Canadian Flint and Spar Co. Mining concession no. 555 covering the north part of lot 6 and the south part of lot 1, range VI was granted to this company in 1945. Imtermittent operations lasted until 1947. The dyke is exposed over a length of 50 feet and a width of 10 to 20 feet. Massive feldspar occured in the trench and was mined without cobbing.

Range V, lots 7, 8.

Ref.: 8 (A.J. Hough, 1955).

Feldspar is said to have been mined on these lots in 1950 by Gordon Skires and Ogden Haskell. In 1955, 15 shallow holes were drilled on a pegmatite occurrence by the McLaurin Feldspar Corp. Many sections of good feldspar were found but no production was recorded.

Range V, lot 15.

Ref.: 1, p.35.

A pegmatite carrying considerable mica and quartz occurs in a dyke some 25 feet wide. No work is reported.

Range V, lot 24

Ref.: 4, p.76; 5 (1923, p.67)

Mr. B. Winning mined spar from this mine in 1923-24. This is the site of the Old Skead mine which was worked for mica by Mr. Haycock in the early years of this century. The dyke is more than 100 feet long and 40 feet wide.

Range VI, lot 17.

Ref.: 4, p.99; 5 (1926, p.49); 8 (J.B. DeMille, 1949)

This is the Sparks Mine worked in 1925-26 by Mr. B. Winning. In 1949, Nor-East Exploration had the deposit examined and evaluated but no production was recorded. Stripping is said to have uncovered a feldspar body 150 feet long and 32 feet wide with possibilities of extension to a length of 400 feet. The feldspar is red to pink with quartz stringers representing less than 20% of the rock.

Range VI, lots 21, 22.

Ref.: 4, p.77

This mine was worked between 1911 and 1923 by O'Brien and Fowler, W. Gowan and by Canadian Amber Mica Co. Both mica and spar were produced. A narrow dyke averaging about 15 feet wide exposed over 40 feet in length contains buff coloured potash spar, white soda spar and quartz intimately mixed; tourmaline and garnet impurities are also present.

Range VI, lot 25.

Ref.: 7 (1944, p.33)

This is known as the Brassard Mine worked in 1944 by Micaspar Industries Limited. A small production was recorded.

Range VI, lots 27, 28

Ref.: 4, p.77; 5 (1935, p.29).

This is the Poltimore Mine worked in 1926-27 by Mr. McGarry and in 1935-36 by W.E. Evans. Massive quartz and large crystals of pink spar associated with mica and tourmaline compose a dyke which has been worked along a steep cliff.

Range VII, lot 4.

Ref.: 5 (1935, p.29)

The little Union mine known as a phosphate producer was worked in 1935 by Bush Winning who shipped a small tonnage of feldspar.

Range VII, lot 5.

Ref.: 8 (P.E. Bourret, 1936).

This deposit was discovered in 1936 by Donald and W.M. Cameron. A pegmatite dyke containing mostly white-grey feldspar with small patches of quartz and few crystals of tourmaline and graphite. The dyke is more than 800 feet long and about 20 feet wide. The feldspar is said to be of good quality and easily extracted but only a small production was recorded.

Range VII, lot 20

Ref.: 4, p.77.

Mr. B. Winning did some work on this deposit in 1926 and shipped a small tonnage of spar. The dyke is 20 feet wide and exposed for a length of 100 feet. It consists mostly of quartz with scattered crystals of potash and soda spar. Some biotite is associated with the soda spar.

Range VII, lot 23.

Ref.: 5 (1926, p.49)

Bush Winning reported a small production from this lot in 1926.

Range VII, lot 27.

Ref.: 7 (1942, p.27)

A small production was reported from this deposit known as the Bush Winning mine in 1942.

PROVOST Township, Berthier county.

Range A, lot 17.

Ref.: 8 (O.D. Maurice 1952, P.E. Bourret, 1952).

A pegmatite occurrence is uncovered at two locations one hundred feet apart. A limited amount of trenching was done on this deposit in 1951, some good crystals of potassium feldspar mixed with quartz and some biotite were encountered.

ROBERTSON Township, Labelle county.

Ranges IV, V, VI.

Ref.: Dept. of Mines, G.R. no 23, p.49.

Some work was done on feldspar occurrences in these ranges during 1939-40.

SUZOR Township, Laviolette county.

Ref.: 7 (1955, p.39)

In 1952 and 1954, Siscoe Vermiculite Mines Ltd., shipped a few hundred tons of feldspar granules used chiefly in the production of coated asphalt sheeting. The feldspar was a by product in the recovery of mica.

TADOUSSAC Township, Saguenay county.

Range III.

Ref.: 1, p.49.

Pegmatite dyke worked for mica by Messrs. Caron and Desmeules in 1892.

TEMPLETON Township, Papineau county.

Range II, lot 14.

Ref.: 4, p.78; 5 (1920, p.62).

This deposit was mined intermittently from 1896 to 1920 by various operators the last of which was Messrs Watts and Noble. A total of 9,000 tons of feldspar was extracted. Pink spar and massive quartz carrying many impurities like hornblende, tourmaline, biotite and muscovite characterize this pegmatite occurrence.

Range VII, lot 26.

Ref.: 4, p.78.

This deposit was worked in 1912 by D. Bray and again in 1915 by A. Wallingford. Large pegmatite dyke exposed over a length of 1000 feet and maximum widths of 150 feet consists mostly of graphic granite.

Range VIII, lot 26.

Ref.: 1, p.37.

This deposit was first worked in 1898 by J.H. Taylor and between 1899 and 1901 by W.A. Allen. More than 5,000 tons of spar was shipped. Quartz and feldspar are intergrown in a graphic structure but the two minerals can often be separated easily by hand cobbing. The dyke is exposed on the side of a hill some 150 feet high for a length of 500 feet.

Range IX, lot 27.

Ref.: 4, p.78.

Worked by Mr. Wallingford from 1926-1928, 500 tons of spar mined from two deposits situated in the northern and southern part of the lot respectively. The north dyke is exposed over a width of 75 feet and is traced by outcrops over a length of 700 feet. The feldspar is pink with little quartz and impurities. The south dyke is exposed on the side of a hill over a width of 30 feet; the spar is rusty and stained.

Range XII, lots 6-7.

Ref.: 8.

Production from this lot was reported by E. Wallingford from 1949 to 1953.

Range XII, lots 20 S$\frac{1}{2}$

Ref.: 8 (P.E. Bourret, 1950).

This mine was opened around 1930 by Frank Toutloff. In 1940, Waldrick Wallingford reported a small production. Operations were resumed for a short period in 1949 by Arthur Wallingford. The pegmatite dyke is

exposed over a length of 400 feet and a width of 200 feet. A red feldspar mixed with massive quartz occurs near the middle of this dyke in a zone 50 feet wide.

Range XIII, lot 28.

Ref.: 7 (1942, p.27; 1947, p.39).

This is the Wakefield mine worked from 1942 to 1947 by the Canadian Flint and Spar Co. Ltd.

Localities mentioned in Templeton Township

Location	References
Range II, lot 13	9 (1897, p. 284).
Range V, lot 26	G.S.C. Summ. Rept. 1915, p. 165
Range VI, lot 25	5 (1898, p.42)
Range VII, lot 14	5 (1898, p. 42)
Range VIII, lot 27	1, p.38
Range IX, lot 14	G.S.C. Summ. Rept. 1915, p. 166
Range X, lot 7	" " " " "
Range X, lots 14-15	" " " " "
Range XIII, lot 23	" " " " 165

TOUSSAINT Township, Abitibi East county.

East half of township

Ref.: A. Laurin, Que. Dept. of Mines G.R. 130; J. Gittins, unpublished report.

This is the only known occurrence of nepheline syenite in Quebec which has been considered as a possible source of ceramic material. Unfortunately, the deposit lies some 43 miles north of the nearest railroad line and in view of the low value of nepheline syenite it could not be economic

to mine it at the present time. The chemical analyses of samples scrubbed and wire brushed and run through magnetic separators gave a relatively high alumina content of the order of 25 to 29.5%, but the iron content as Fe_2O_3 was also high at 0.2 to 0.25%.

VILLENEUVE Township, Papineau county.

Range I, lots 30, 31.

Ref.: 4, p.79; 5 (1933, p.38).

This is the Villeneuve mine which was opened for mica in 1884 and was active intermittently until 1939 producing both mica and feldspar, some of which is of dental grade. The dyke is about 150 feet wide and contains potash and soda spar with quartz, large hooks of muscovite are associated with the soda spar together with crystals of tourmaline and garnet.

WAKEFIELD Township, Gatineau county.

Range III, lots 24, 25, 26.

Ref.: 7 (1943, p.52).

This deposit known as the Wakefield mine was worked in 1942-43 by the Gatineau Mining and Contracting Co. Ltd., and in 1944 by the Canadian Flint and Spar Company.

Range VII, lot 25 E½

Ref.: 1, p.42.

This deposit known as the Leduc Quarry was mined for mica (lepidotite) in 1885 by L.H. Shirley. In 1908, J. O'Brien extracted green and pink tourmaline which is plentiful but not of gem grade. The pegmatite

is about 40 feet wide and contains white and smoky quartz, green microcline and lepidotite. Large crystals of feldspar can easily be separated and amazonite occurs in a matrix of cream coloured feldspar.

Range VIII, lot 28, N½

Ref.: 8 (P.E. Bourret, 1953).

This deposit was worked in 1953 by Gregory O'Connor of Buckingham. A pegmatite dyke is exposed for a length of 300 feet and a width of 30 feet. It consists mostly of micropegmatite but the center of the dyke contains a lense of good feldspar from 5 to 10 feet wide and 50 feet long.

WALTHAM Township, Pontiac county.

Range II, lot 30.

Ref.: 1, p.44

This deposit was worked around 1915 by C.B. de Loye and A.D. Libby. The dyke appears to be small consisting of grey-brown microcline.

WENTWORTH Township, Argenteuil county.

Range X, lots 19a, 19b.

Ref.: 8

William and T.H. Argale worked this deposit in the early twenties and sold it to Georges L'Heureux in 1928. All operation ceased in 1931.

FLUORITE

Fluorite has not been produced on a large scale in Quebec; the only recorded production was in 1944 when the Twin-Valley Prospection Syndicate shipped a few tons of ore from a mine situated in Huddersfield Township. A list of occurrences is nevertheless useful to indicate the areas of prospecting interest.

The name fluorspar is often used to describe the ore in which the mineral fluorite occurs. The chemical formula of the mineral is CaF_2 and will contain 51.1% calcium and 48.9% fluorine in pure form. It is found in a great variety of colors and even a single crystal may have different colors on different faces. The Romans used it as a decorative stone but its hardness is only 4 in the Mohs scale which prevents its use as a gem. It often occurs in large crystals of cubic or octahedral form and it has a perfect octahedral cleavage; the specific gravity of the crystal is 3.18.

Fluorite is used principally in the iron and steel industry as a flux; in the chemical industry especially in the making of hydrofluoric acid which has itself a great number of uses including the making of artificial cryolite for the aluminum industry; in the ceramic industry for the manufacture of white and colored opal glasses and enamels and as a decolourizer in glas batches.

There are three grades on the market:

the acid grade must contain at least 97% CaF_2, and the SiO_2 content should be less than 1%, it is usually sold in powder form and sells for about $50.00 to $55.00 per short ton f.o.b. Illinois.

the metallurgical grade contains 72 to 85% CaF_2 depending on the silica content. It is used mainly as a flux in the steel industry where coarse material is preferred and where sulphur compounds are undesirable. This grade sells for $35.00 to $42.00 per short ton f.o.b. Illinois, depending especially on the CaF_2 content.

the ceramic grade is usually fine grained and contains upward of 94% CaF_2; calcium carbonate, silica and iron are undesirable impurities especially the latter which should not be present in amount of more than 0.1% calculated as Fe_2O_3. The ceramic grade sells from $45.00 to $52.00 per short ton f.o.b. Illinois depending on CaF_2 content.

PRINCIPAL REFERENCES:

(1) Quebec Dept. of Mines, Office Records.

(2) " " " Annual Report on Mining Operations.

(3) Geological Survey of Canada, Annual Report.

(4) " " " Memoir.

(5) " " " Report of Progress.

(6) Mines Branch Ottawa, Publication No.

(7) Geological Survey of Canada, Summary Report.

(8) Geological Survey of Canada, "Geology of Canada, 1863"

(9) Que. Dept. of Mines, Preliminary Report no.

(10) Annual Report of the Commissioner of Crown Lands.

(11) Que. Dept. of Mines, Geological Report no.

(12) The Mining Industry of the Province of Quebec.

LIST OF OCCURRENCES

AUMOND Township, Gatineau county.

Range III, lot 49.

Ref.: 11, G.R. no 23, p.50

Small inclusions of purple fluorite in aplite.

BOYER Township, Labelle county.

Range VII, lot 28.

Ref.: 2, 1932, pt. E, p.41.

Fluorite associated with graphite on property of Standard Graphite.

CAMPBELL Township, Labelle county.

Range A, lot 4.

Ref.: 2, 1932 pt E, p. 45.

Fluorite stringers in the Guenette granite.

Range I, lot 19.

Ref.: 11, G.R. no. 23, p.50

Smale patches of purple fluorite in a pegmatite dyke.

COOPMAN Township, Duplessis county.

Near mouth of Manitou River

Ref.: 1, (E.W. Greig, 1944); 10, 1884, p.97.

Fluorite in calcite veins cutting granite.

DASSERAT Township, Rouyn-Noranda county.

Block B

Ref.: 2, 1915, p.28.

Fluorite found with pyrite and galena prospected in 1915 by A. Renault especially for gold.

DERRY Township, Papineau county.

Range IX, lot 1.

Ref.: 2, 1900, p.222; 3, vol. XV Pt. A, p.43b (1907).

Green fluorite in a mica mine worked by W.A. Allan in 1900.

EAST PORTLAND Township, Papineau county.

Range VII, lot 22.

Ref.: 3, vol. XII, pt. O, p.38 (1902).

Fluorite crystals in apatite deposit known as the North Star mine.

FOURNIERE Township, Abitibi-East county.

Blocks 1 and 2.

Ref.: 4, 222, p.70.

Purple fluorite in auriferous pegmatite veins at Canadian Malartic Gold Mines Ltd.

GRAND CALUMET Township, Pontiac county.

Range IX, lots 27 and 29.

Ref.: 1, (F. Cornwall, 1953).

On lot 29 a purple fluorite is seen in recrystallized limestone associated with apatite and uranium bearing minerals. The mineralized zone is 20 feet wide and contains about 20% fluorite. On lot 27 another zone is exposed over a width of 4 feet.

Range VI and VII, lots 27 to 34.

Ref.: 1 (P.E. Riverin, 1953).

Fluorite is associated with uranium bearing minerals on the property of Calumet Uranium Mines. In 1953-54, this company drilled 80 holes for a total length of 38,745 feet on these claims but the main interest was the radioactive occurrence.

GRENVILLE Township, (Augmentation), Argenteuil county.

Ref.: 5, 1877-78, pt G. p.16.

Fluorite in metamorphic pyroxenite.

HUDDERSFIELD Township, Pontiac county.

Range V, lot 17.

Ref.: 1 (P.E. Bourret, 1950); 12, 1955, p.26; 6, 396, p.121.

This is the only fluorspar deposit in Quebec which has been developed to such an extent that the mining of fluorspar was seriously considered around 1955. The area was well known as an active mica and phosphate district in the past and fluorite had been mentioned early as an associate mineral. In 1944, Twin-Valley Prospecting Syndicate shipped 18 tons of fluorite to the Haley plant of Dominion Magnesium Co. In 1954-55, Yates Uranium Mines Ltd. undertook an extensive programme of exploration and diamond drilling with the result that two important mineralized zones were outlined containing radioactive minerals associated with fluorite, apatite, phlogopite, scapolite, tourmaline and pink calcite in a greenish-grey pyroxenite. Fluorite occurs in appreciable quantity in the Matte zone only; bulk samples of 1,000 pounds up to 5 tons showed percentages

of fluorite varying from 12 to 25%. This zone measures 650 feet in length and varies in width from 5 to 30 feet. The property was acquired by Lake Otter Uranium Mines Ltd. in 1957.

HULL Township, Gatineau county.

Range X, lot 7.

Ref.: 5, 1873-74, p.145.

Crystalline limestone containing green fluorite with barite in a 3 foot wide vein.

Range X, lot 14.

Ref.: 5, 1877-78, pt. G, p.16.

Fluorite associated with apatite in metamorphic pyroxenite.

JACQUES-CARTIER county.

Mont Royal

Ref.: 8, p.463.

A small vein of purple fluorite in a grey fossiliferous limestone.

JOHAN-BEETZ Township, Duplessis county.

About one mile S-W of Johan-Beetz village.

Ref.: 1 (E.W. Greig, 1944); 9, 184, pp. 8 and 15.

Fluorite in narrow fissure and breccia veins in granite associated with quartz and calcite.

LACORNE Township, Abitibi-east county.

Ranges I, lots 1-4; II, lot 9; V, lots 1-6.

Ref: 4, 253, p.85; 1, (M. Latulippe, 1955).

Fluorite occurs in small quantity in veins near the Lacorne batholith; they were prospected for molybdenite and spodumene and are known to contain small amounts of bismuth, tourmaline, apatite, beryl and scheelite in addition to fluorite.

LEMIEUX Township, Gaspé-North county.

Federal Lead and Zinc Mine

Ref.: 11, no. 63, p.51..

Fluorite is mentioned as an accessory mineral in quartz veinlets containing galena and sphalerite.

LESSIEUR Township, Abitibi-East county.

O'Brien Gold Mines Ltd.

Ref.: 9, 227, p.81.

Fluorite occurs in quartz stringers cutting syenite.

MONTAUBAN Township, Portneuf county.

Range I, lot 5a

Ref.: 1, (W.N. Ingham, 1942).

A purple fluorite lead from 3 to 12 inches wide has been traced for a length of 25 feet in a pegmatite dyke. A parallel band of green apatite also occurs in the pegmatite. This area was prospected for molybdenite at various times.

MONTBEILLARD Township, Rouyn-Noranda county.

Ranges IX, lots 50-52; X, lots 49-58;.

Ref.: 1 (J. Dugas, 1957).

This deposit was explored in 1939-40 by the Cook Copper & Fluorite Corp. Ltd. A quartz zone 10 to 40' wide and 575' long contains fluorite veinlets up to one inch in thickness. A 300 pound sample was shipped in 1940 to the Ore Dressing and Metallurgical Laboratories in Ottawa and flotation tests proved the possibility of obtaining an acid grade product.

MURRAY BAY Township, Charlevoix county.

Ref.: 8, p.463.

Green fluorspar in veins of calcite and galena within Potsdam sandstone.

ONSLOW Township, Pontiac county.

Range III, lot 13.

Ref.: 4, 136, p.115

A zone 5 feet wide containing parallel veins of barite with a little fluorite within porphyritic syenite.

Range VII, lots 9-10.

Ref.: 4, 136, p.72; 1 (F.F. Osborne, 1941).

Scattered grains of fluorite and masses up to several inches in diameter occur near Quyon in some molybdenite deposits, notably the Moss Mine, associated with pyrite, pyrhotite and quartz in quartz syenite. This property was worked during world war II for molybdenite by the Quyon Molybdenite Co. Ltd.

PREISSAC Township, Abitibi-East county.

Range X, Block F.

Ref.: 2, 1911, pp. 188-189; 7, 1920, p.207.

Pegmatite dykes containing molybdenite, bismuthinite and pyrite in addition to purple fluorite on the old property of Height of Land Mining Co. which was worked for molybdenite in the first decade of this century.

QUEBEC City, Quebec county.

Near Citadel

Ref.: 8, p.463.

Calcite veins within the black slates near the Citadel carry veins of calcite containing purple fluorite.

ROUVILLE County.

Mount St. Hilaire

Ref.: 4, 43, p.56.

The nepheline syenite dykes carry fluorite associated with green pyroxene and hornblende.

SICOTTE Township, Gatineau county.

Range I, lot 24.

Ref.: 11, no. 23, p.50

Small patches of fluorite with epidote in joint planes of gneissic aplite.

TEMPLETON Township, Papineau county.

Range I, lot 15. Ref.: 3, Vol. IV, pt. A, p.49

Range V, lot 1. Ref.: 5, 1873-74, p.145.

Range XII, lot 12. Ref.: 5, 1877-78, p.16.

Occurrences mentioned.

VILLENEUVE Township, Papineau county.

Range I, lot 31.

Ref.: 6, 118, p.197.

Purple fluorite is mentioned as an associate mineral in the muscovite dykes of the Villeneuve Mine.

WAKEFIELD Township, Papineau county.

Range VII, lot 25.

Ref.: 6, 118, p. 199.

The old Leduc Mine worked for feldspar in the early part of this century contains lepidolite, tourmaline, uraninite and some fluorite.

GARNET

Garnets are industrial minerals used especially as abrasives because of their hardness. There are several varieties but the most common are grossularite, pyrope and almandite which are aluminium silicates containing calcium, magnesium or iron.

Garnet mining has never been an important industry in Quebec although many deposits are known. There is little chance for success of a mining venture because the demand is small in Canada as well as in the United States; the 1966 consumption in Canada was only 190 tons valued at $53,000; in the U.S. the consumption was 21,952 tons valued at U.S. $2,092,000. Even in that country, the chances of developing new deposits are poor because the producing mines are perfectly able to fulfill the demand and they have enormous reserves.

The following list of principal occurrences has then only one purpose: to complete the bibliography on industrial minerals indicating the areas of interest in case some local industry may require such a product.

PRINCIPAL REFERENCES

(1) G.S.C. Annual Report

(2) Mining Operations in the Province of Quebec

(3) Quebec Bureau of Mines, Annual Report

(4) Canada Dept. of Mines, Mines Branch, publ. no.

(5) Office records

(6) Quebec Dept. of Mines, Geological Report no.

(7) Quebec Dept. of Natural Resources, Preliminary Report no.

(8) G.S.C. Memoir no.

LIST OF OCCURRENCES

ARGENTEUIL Seigniory, Joliette county.

Ranges VI and VII

Ref.: 1, Vol. VIII, pt. J., p.52

Bands of quartzite and sillimanite gneiss containing red garnets.

BAUDIN Township, Abitibi-East county.

3¼ miles east of Langdale Station

Ref.: 2, 1916, p.166; 2, 1928, pp. 59-60; 3, 1935 C, p.37.

Bands of gneiss rich in red garnets was developed in 1928 by the Langdale Garnet Syndicate; a test lot of 1940 pounds of ore yielded 425 pounds of garnet.

BOISCLERC Township, Temiscamingue county.

On Snake creek at Les Erables rapids

Ref.: 4, 677, p.25

Red garnets occur in the basic portions of a biotite gneiss associated with kyanite.

BOURG-LOUIS Seigniory, Portneuf.county.

Near Lake Simon and Three Mountains Lake.

Ref.: 1, 1858, pp. 27-29.

Small garnets in a gneiss on limestone contact.

BOURGMONT Township, Abitibi-East county.

Near Lake Lacoursière

Ref.: 5

Occurrence similar to that of adjoining Baudin Township which was worked in 1928.

BOUTHILLIER Township, Labelle county.

Range IV, lot 23.

Ref.: 6 no. 23, p.52

Garnet crystals up to 5 inches in diameter in amphibolite and surrounding granite gneiss.

BRANDON Township, Berthier county.

Range X, lot 4.

Ref.: 1, Vol. VIII, pt. J. pp. 51, 64, 84, 150; 6, no. 133, p.7.

Irregular masses of garnet in sillimanite gneiss seen on many outcrops.

CAMPEAU Township, Temiscamingue county.

1/4 mile north of Ottawa River and 10 miles east of the town of Temiscaming, Ontario.

Ref.: 5.

In 1968 and 1969, North American Refractories Limited did exploratory work and erected a mill to treat a kyanite-garnet gneiss. The rock is said to contain from 12 to 20% garnet.

CAMPBELL Township, Labelle county.

Range D, lots 5-6.

Ref.: 6, no. 23, p.52.

Garnetiferous gneisses containing bands almost exclusively composed of garnet.

CATHCART Township, Joliette county.

S.W. Corner of Township

Ref.: 1, Vol. VIII, pt. J. 1896; 4, no 677, p.19.

Bands of garnetiferous gneiss running about north-south for at least one quarter mile. In places, the rocks average 30 per cent garnet with crystals 1/4 to 1 inch in diameter.

CAXTON Township, St. Maurice county.

Between St. Elie and Charette

Ref.: 1, Vol. IV, pt. A.A, p. 51 (1894)

Garnetiferous gneiss traced for a distance of 4 miles.

CLYDE Township, Labelle county.

Along the Red River

Ref.: 1, Rept. of Progress, 1863, p.24

Feldspathic gneiss contains garnet crystals in a band 150 feet wide near limestone contact.

DE RAMSAY Seigniory, Joliette county.

8 miles N-W of St. Felix de Vallois

Ref.: 1, Vol. VIII, pt. J 1896; 4, no. 677, p.20

Garnet-sillimanite gneiss with large crystals up to 3 inches in diameter, exposed at numerous places but especially on road along the Black River, N-W of St. Jean de Matha.

GENDREAU Township, Temiscamingue county.

At Greenorton, 2 miles north of Kipawa

Ref.: 1, Vol. X, pt. I, pp. 178, 211 (1899); 4, no. 677, p.25.

Hornblende-garnet gneisses.

GRANDISON Township, Terrebonne county.

South of Lake Tremblant

Ref.: 1, Vol. VIII, pt. J. pp. 54-55, 1896.

Garnet-sillimanite gneisses exposed on lake shore.

GRENVILLE Township, Argenteuil county.

Range V, lot 3.

Ref.: 1, Rept. of Progress, 1873-74, p.201.

Garnet constitutes the gangue in a magnetite vein.

JOLY Township, Labelle bounty.

Range A, lot 10

Ref.: 3, 1935 pt. C, p.70

In 1935, Garnet Products Limited opened a quarry on this lot and built a small mill to treat some garnetiferous gneisses and pegmatites. Considerable trouble was experienced in the mill operation and only a small tonnage was produced.

Range B, lot 25.

Ref.: 3, 1934, pt. E, pp. 35-36.

In 1933, Eugene McNicoll prospected a garnet deposit on this lot and a sample was tested in the Ore Dressing and Metallurgical Laboratories in Ottawa. A small production was recorded consisting of grains of feldspar and quartz in addition to garnet; the product was used exclusively for sand blasting.

Range I, lot 10

Ref.: 5.

In 1933 and 1934, a deposit on this lot was worked successively by Montreal Garnet Products Ltd. and International Garnet Syndicate. Two samples were tested in Ottawa by the Ore Dressing and Metallurgical Laboratories. No production is recorded.

Range I, lot 16.

Ref.: 4, p. 21, no. 677.

Parallel veins of pyrrhotite and massive garnet occur in a garnetiferous biotite-quartz gneiss. This deposit was worked around 1925 by Messrs. H. Jodoin and F.H. Moranville but no production was reported.

Range J, lots 16, 17.

Ref.: 3, 1934, pt. E, pp. 33-34; 5.

This is the location where the greatest efforts were made to mine garnet in Quebec. The first mining claims were recorded in 1907 and development work was carried out each year until 1918. In 1927, a mining concession was granted to Labelle Nickel and Garnet Co. Ltd. which is said to have spent more than $65,000. on development work, construction, road building and machinery between 1927 and 1932. The production was about

100 tons including ore for experimental purposes. In 1934, Labelle Mining Incorporated took over the property and spent another $3,600. on wages for development work between 1934 and 1937. In 1938, Canada Garnet Limited acquired the property and spent another $190,000. for development work and the erection of a mill.

The total sales from 1927 to 1946 amounted to 142 tons valued at $1,202.00 including 2 tons of red garnet at $75.00 per ton and 140 tons of concentrates suitable for sand blasting at $7.51 per ton.

There are two types of garnet on the property; the red garnet which is of good quality but the deposits are small and the pink garnet which is present in large quantity but is of inferior quality because of its admixture with other minerals which make the product friable. The best grade is found in pegmatite dykes that cut the Grenville rocks and as replacements of crystalline limestone. In this latter form, the garnet is seen in large clots associated with pyrrhotite, magnetite, amphibole and sphene.

KIAMIKA Township, Labelle county.

Range VI, lots 45 and 46.

Range VII, lot 45.

Ref.: 6, no. 23, p.52

Garnetiferous gneiss outcroping at many places on these lots.

KILDARE Township, Joliette county.

Range XI and XII, west of Lake François

Ref.: 1, Vol. VII, pt. J. p.52 (1896)

Red garnets in sillimanite gneiss.

LACOSTE Township, Charlevoix county.

Vast region including the township and the vicinity of Baie St. Paul, St. Irenée and Malbaie.

Ref.: 1, Vol. V, pt. A, p.49 (1893)

Claims were staked in 1935 on a garnet occurrence in Lacoste Township and many examples of large garnet crystals have been reported in this general region.

LAFLECHE Township, Saguenay county.

Ref.: 4, no. 677, p.24; 7, no. 481, p.3

Garnet gneisses are abundant in this township and surrounding region. Large garnets have been noted on many outcrops along the Manicouagan and Outardes Rivers.

MONTAUBAN Township, Portneuf county.

Range I, lots 41-43

Range V, lots 9-12

Ref.: 2, 1915, p. 119

Garnet rich bands in the gneisses near the lead-zinc deposits in this township. The garnets are associated with phlogopite, quartz, cordierite and small crystals of spinel and rutile.

ORFORD Township, Sherbrooke county.

Range XII, lot 7

Range XVI, lot 6

Ref.: 1, Vol. IV, pt. T, 1890, p.28; 1, Rept. of Progress 1863, pp. 496-497; 1, Rept. of Progress 1853-56, p. 449; 7, no. 464, p.13; 8, no. 257, p.134.

On these lots the green chrome garnet uvarovite has been noted. Some specimens are said to be of gem grade.

PORTLAND WEST Township, Papineau county.

Range IX, lot 9.

Ref.: 1, Rept. of Progress 1882-84, pt J, p. 11

Green and red garnets reported associated with pyroxenes.

RAWDON Township, Montcalm county.

Range VII, lots 20-21

Ref.: 4, no. 677, p.24.

A zone of quartzite and garnet rocks 150 feet wide crosses the Ouareau river near Darwin rapids. Some bands contain as much as 30% garnet.

WAKEFIELD Township, Gatineau county.

Range I, lots 6 and 14

Ref.: 1, Rept. of Progress, Pt. G 1877-78, p.26

Garnets in limestone associated with sulphides and graphite.

GEMS AND DECORATIVE MATERIALS

Quebec does not produce any gem material and no deposit of commercial interest are known although specimens of semi-precious stones have been found in many places and even mined on a small scale. Decorative materials such as porphyries, jasper and certain types of feldspars are more common and abundant but little effort has been made to mine them as such.

We beleive it useful to list the principal localities where such material exists in order to possibly stimulate prospecting and utilization.

The Laurentian district is very likely the most interesting ground for prospection and according to F.F. Osborne (5, 1936-C, p.24) "indications of the presence of some of the gem materials exploited in Ceylon are found in the Laurentian rocks".

PRINCIPAL REFERENCES

(1) G.S.C. Report

(2) Can. Dept. of Mines, Mines Branch, Publ. No.

(3) G.S.C. Memoir No.

(4) Office files

(5) Quebec Bur. of Mines, Annual Report

(6) Canadian Chemistry, January 1942

(7) Que. Dept. of Mines, Geological Report No.

(8) Canadian Record of Science

(9) G.S.C. New Series

LIST OF OCCURRENCES

ABERCROMBY Township, Terrebonne county.

Range X

Ref.: 1, 1887-88, p. 74S; 2, 279, p.258.

Irridescent labradorite has been observed in the anorthosites ot this township.

AMHERST Township, Papineau county.

Range VI S, lots 4-6.

Ref.: 6, p. 11

Large and clear crystals of quartz in an open pit which has yielded both kaolin and quartz. The crystals occur in bands of varying thickness up to three feet or more and lengths up to fifty feet. The sizes of the crystals vary from very small up to 10 inches in length.

ARGENTEUIL Seigniory, Argenteuil county.

Near Lachute

Ref.: 2, 279, p.255; 1, 1863, p.477; 9, IV, p.62 T.

Coarse grained feldspathic rock with dark green pyroxene, brown sphene, and occasional quartz.

AUBIN DE L'ISLE Seigniory, Beauce county.

Near Famine River

Ref.: 2, 279, p.259.

Honey yellow translucent masses of a substance called agalmatolite, a soft mineral used in sculpture and related to pyrophyllite or the micas.

AYLWIN Township, Gatineau county.

Range VI, lot 48

Ref.: 8, Vol. IV, p. 475.

Spinel found in crystals.

BIGELOW Township, Papineau county.

Range V, lot 52.

Ref.: 1, 1910, p.266.

Spinel found in crystals.

BOLTON Township, Brome county.

Range IX, lots 14, 15.

Ref.: 2, 279, p.257.

Fuchsite schist occurring in a band 5 to 15 feet wide. The polished surface gives a handsome greenish color but because of the difference in hardness of the constituent minerals, it is difficult to obtain a high polish.

BROME Township, Brome county.

Ref.: 1, 1887-88, p. 77S; 9, IV, 62T.

Sodalite is reported as occurring in fine blue grains in the granite of Brome. Sphene is mentioned as occurring in amber coloured grains and small crystals on Brome mountain.

BOISBUISSON Township, Gaspe North county.

McGerrigle mountains

Ref.: 2, 279, p.257; 1, 1863, p.834.

Mixture of pale green epidote and quartz occurring in large masses in McGerrigle mountains. The rock is hard and polished to a brigth yellowish green colour.

BOUCHETTE Township, Gatineau county.

Range VI, lots 3-4.

Ref:, 1, 1910, p.266.

Spinel found in crystals.

Range VI, lot 44.

Ref.: 8 Vol. IV, p.475.

Quartz crystals with concave faces.

Range VII, lot 10.

Ref.: 2, 401, p.30.

Pegmatite dyke consisting mostly of graphic granite, the quartz having a smoky tinge and the feldspar a greenish shade. Specimens of amazonite were collected in this deposit.

BUCKINGHAM Township, Papineau county.

Range VII, lot 19.

Ref.: 1, 1887-88, p.79S.

Fine crystals of green, blue, red or grey semi-translucent apatite are found at the Emerald mine on this lot. One of these is said to have weighted 550 pounds. There are many other apatite deposits in Buckingham township.

Range XII, lot 24.

Ref.: 3, 74, p.232.

The green chrome garnet uvarovite was found on this lot.

CARLETON Township, Bonaventure county.

Beach at Carleton

Ref.: 4 (B.T. Denis, 1949).

Agates are found all along the shore of the Baie-des-Chaleurs in Gaspe. The beach at Carleton is one of the preferred locations.

CHATHAM Township, Argenteuil county.

Range VII and VIII, lot 8.

Ref.: 2, 279, pp. 255 and 259.

Brownish black porphyry with red feldspars south of the road between ranges. Green tourmaline crystals are also found in Chatham township.

CLYDE Township, Labelle county.

Lake of Three Mountains on the Rivière Rouge

Ref.: 1, 1863, p.477; 2, 279, p. 255-256.

Granite with cleavable masses of white albite with quartz and mica. Also large red garnets in a white oligoclase gneiss at same locality.

COLERAINE Township, Megantic county.

Range II, lots 25-26.

Ref.: 3, 74, p.233.

Vesuvianite occurs in masses and minute crystals of bright pink colour at the Montreal Chromite pit.

COTE DE BEAUPRE Seigniory, Montmorency county.

At Sault-à-la-Puce

Ref.: 3, 74, p.212

Spinel occurs with chondrodite in limestone.

COURCELETTE Township, Gaspé North county.

On Mount Albert

Ref.: 1, 1887-88, p. 76S

Olive and amber colored crystals of olivine not of gem quality.

CUGNET Township, Duplessis county.

On the Mingan River at the lowest falls.

Ref.: 1, 1863, p.37; 2, 279, p. 257.

Fine grained gneiss with red feldspar and pistachio green epidote in thin reticulating veins.

D'AILLEBOUT-D'ARGENTEUIL Seigniory, Joliette county.

Ref.: 1, 1887-88, pp.66S

Small translucent octahedrons of blue spinel.

DU GOUFFRE Seigniory, Charlevoix county.

Ref.: 9, IV, 56T.

Rutile occurs in small orange-red grains in ilmenite at St. Urbain.

EGAN Township, Gatineau county.

Range I, lot 15.

Ref.: 1, 1909, p.252.

Clear quartz crystals reported.

GRAND CALUMET Township, Pontiac county.

At Calumet Falls

Ref.: 1, 1863, p.475; 2, 279, pp. 255-259.

"A coarse grained rock made up of white feldspar dark green pyroxene with brown sphene and occasional quartz". Fine translucent brown crystals of tourmaline in a flesh-red limestone is also found at this location with vesuvianite.

GRENVILLE Township, Argenteuil county.

Range V and VI, lots 3 and 4

Ref.: 1, 1963, p. 832; 2, 279, p.256.

A quartz porphyry suitable as ornemental stone.

Range IX, lot 16.

Ref.: 4 (P.E. Bourret); 5, 1936, part C, p.24.

Yellowish green and bright green serpentine found in the workings and waste dumps of Canadian Refractories Ltd. Minute blue saphires were also found at this location.

G.F. Kunz (1, 1887-88, p.67S) also mentions crystals of zircon, 4 miles north of Grenville, they are "often cherry red and transparent and would make small gems". A lilac colored pyroxene and wax colored idocrase are also mentioned by Kunz (p.76S).

The occurrence of sphene is mentioned (1, 1863, p.503) and vesuvianite in yellow crystals associated with garnet, pyroxene and zircon (9, IV, 64T).

GRENVILLE AUGMENTATION, Argenteuil county.

Range III, lot 3

Ref.: 1, 1887-88, pp.77S; 2, 279, p.259; 4 (P.E. Bourret); 5 1936-C, p.25.

Laurence McGill worked this deposit of scapolite for several years before 1948; the mineral fluoresces to a bright canary-yellow when exposed to ultra-violet rays. A lilac-colored clear diopside crystal was also noted on this property.

HAM Township, Wolfe county.

Range VI, lots 11-13.

Ref.: 4 (P.E. Bourret)

Bright green serpentine found on the property of Dominion Asbestos Mine.

HARRINGTON Township, Argenteuil county.

Ref.: 9, VII, 102A.

Vesuvianite in yellow crystals with garnet pyroxene and zircon. Scapolite is reported in range II, lot 18 (3, 74, p.235).

HUDDERSFIELD Township, Pontiac county.

Range IV, lots 19-21

Range V, lots 19-20

Ref.: 4 (P.E. Bourret)

Purple and sometimes apple green fluorite as large masses and crystals, together with greenish-grey crystals of apatite found in workings and waste dumps of the Yates Uranium Mine.

HULL Township, Gatineau county.

Range IX, lot 14.

Ref.: 2, 279, p.259

Pyrallolite, a mineral related to agalmatolite occurs on this lot and meseum specimens have been cut from this material.

Range X, lot 15.

Ref.: 1, 1882-84, p.166; 1887-88, p.72S; 2, 279, p.257.

A belt of Jasper traced for 150 yards varying in thickness from one to two feet.

Range XI, lot 10

Range XVI, lot 6

Ref.: 2, 118, p.296

Scapolite reported at the Nellie and Blanche mine and at the Horseshoe mine.

Range XIII, lot 12a

Ref.: 2, 118, p.299

Sphene occurs in fine crystals on this lot.

Range XIV, lots 13, 14.

Ref.: 2, 731, p.64.

Pale green amazonite spar found on property of Wallingford mine, with considerable tourmaline and purple fluorite.

HUNTERSTOWN Township, Maskinonge county.

Ref.: 9, IV, 65T.

Scapolite reported.

JACQUES-CARTIER Seigniory, Montreal.

Mount Royal

Ref.: 1, 1887-88, p.76S and 77S.

Olivine crystals amber colored and imperfect found on Mount Royal. Also sodalite in fine blue grains.

KINGSEY Township, E. Drummond county.

Range III, lot 8.

Ref.: 1, 1909, p.250

Small transparent quartz crystals.

LACOLLE Seigniory, St. Jean county.

Near Lacolle

Ref.: 1, 1887-88, p.69S

Fine crystals of quartz found in the soil and in vugs within limestone formations.

LAUZON Seigniory, Levis county.

Ref.: 1, 1887-88, p.69S; 2, 279, p.259.

Small, doubly terminated quartz crystals found in the limestone of the Levis formation. At St. Nicholas, agalmatolite is said to occur.

LEMIEUX Township, Gaspé North county.

Ref.: 4, (P.E. Auger, B.T. Denis); 7, 63, p.7

Agates are found in some abundance on the road to Lake Ste. Anne near the entrance to the National Park; 50 pounds are said to have been collected in two hours at this locality. Large agates are also found at the foot of Mount Lyall. "Amethystine quartz is common in the form of veinlets which fill cavities in the white quartz or cut the latter along fracture planes," at the property of Federal Lead and Zinc Mines.

LESSEPS Township, Gaspé North county.

McGerrigle mountains

Ref.: 2, 279, p.257; 1, 1863, p.834.

Epidote and quartz forms great masses in these mountains.

LITCHFIELD Township, Pontiac county.

Range XI, lot 21

Ref.: 9, XI, 17R; 3, 74, p.235.

Fine, lustrous contact twins of black titanite have been found with orthoclase, scapolite, pyroxene and calcite. Scapolite is also reported at this location.

LOW Township, Gatineau county.

Range IX, lot 31

Ref.: 9, IV, 65T

Scapolite reported.

MARCHAND Township, Labelle county.

Near the village of l'Annonciation.

Ref.: 5, 1934-E, p.41

Green serpentine as grains, and aggregates in the quarry of Canada Marble and Lime Reg'd. An amber variety locally known as "onyx" forms rims around a diopside rock.

MARIA Township, Bonaventure county.

Ref.: 4 (B.T. Denis)

Agates are found on the beach at Maria and at many places along the coast of Baie des Chaleurs especially where the Bonaventure conglomerate is being eroded.

MONNOIR Seigniory, Iberville county.

On Mount Johnson

Ref.: 8, IV, 62T

Sphene occurs in the diorites of Mount Johnson.

MONTARVILLE Seigniory, Chambly county.

Ref.: 1, 1887-88, p.76S.

Olivine crystals mentioned in this locality on Mount St. Bruno.

MORIN Township, Terrebonne county.

Ref.: 1, 1887-88, p.74S.

Labradorite crystals several inches in diameter showing blue opalescence found at Morin, Quebec.

MURRAY BAY Seigniory, Charlevoix county.

Ref.: 1, 1887-88, p.79S; 2, 279, p.259.

Green compact fluorite found in veins of white calcite in the Trenton sandstones at Murray Bay and Baie St. Paul.

NOUVELLE Township, Bonaventure county.

West of Wharf at Maguasha Point.

Ref.: 4 (H.W. McGerrigle).

One of the favored localities on the shores of Baie des Chaleurs where agates are found on the beach.

ORFORD Township, Sherbrooke county.

Range XII, lot 6.

Ref.: 1, 1887-88, p.68S and 76S; 3, 257, p.135.

Uvarovite, the green chrome garnet, occurs in beautiful transparent dodecahedrons and in deep emerald green color. The crystals are rarely more than one eight inch in diameter; they are associated with diopside and chromite on the property of Orford Nickel and Copper company. A deep chrome-green pyroxene is also reported from Orford.

PERCE Township, Gaspe South county.

On beach

Ref.: 4 (B.T. Denis)

One of the favored locations for collecting agates on the shore of Baie des Chaleurs.

PORTLAND WEST Township, Papineau county.

Range V, lots 15-18.

Range VI, lots 13, 14, 16.

Ref.: 4 (P.E. Bourret).

Yellowish green and bright green serpentine from workings and waste dumps of Eastern Asbestos Mine.

Range VII, lots 5-8.

Range VIII, lots 1-4, 7-9.

Ref.: 4 (P.E. Bourret).

Green, blue, red or grey semi-translucent masses of apatite found in the workings and waste dumps of the High Rock and Big Union Mines; zircon crystals are also present.

Range X, lot 16

Ref.: 9, VI, p.25R.

Spinel found in crystals.

RAWDON Township, Montcalm county.

Range VII, lot 20.

Ref.: 1, 1895, p.150J; 2, 279, p.256; 7, 92, pp.10-13.

Garnetiferous gneisses which could be used as ornemental stones.

RIVIERE OUELLE Seigniory, Kamouraska county.

Ref.: 1, 1863, p.834; 2, 279, p.257.

At Riviere Ouelle, a band of red and green jasper containing veins of chalcedony could be suitable as decorative material.

RIPON Township, Papineau.

Range VIII, lot 13.

Ref.: 1, 1877-78, p. 32G.

Scapolite reported.

ROUVILLE Seigniory, Rouville county.

At Rougemont

Ref.: 1, 1887-88, p.76S.

Olivine crystals, olive and amber colored, found at Rougemont.

ROY Township, Abitibi East county.

East of Asbestos Island

Ref.: 3, 74.

Uvarovite, the green chrome garnet was found on a small island east of Asbestos Island.

SHEFFORD Township, Shefford county.

Shefford Mountain

Ref.: 9, IV, 62T.

Sphene crystals reported.

STANSTEAD Township, Stanstead county.

Range I, lot 15.

Ref.: 2, 279, p.259;

Agalmatolite, the figure stone used for carving into ornemental objects is said to occur on this lot.

STOKE Township, Richmond county.

On Stoke mountain

Ref.: 2, 279, p.256; 1, 1902-03, p.310A.

Granite porphyries form a considerable portion of Stoke mountain.

STUKELY Township, Shefford county.

Range X, lot 23

Ref.: 4 (P.E. Bourret).

Clear quartz crystals up to 2 inches in diameter have been found on the property of Adam Quartz and Crystal Mining Limited. They were not sufficiently abundant to justify mining.

SUTTON Township, Brome county.

Ref.: 9, IV, 56T.

Rutile occurs in small, red, flattened crystals in the chloritic schists.

TEMPLETON Township, Papineau county.

Range VII, lot 18.

Ref.: 4 (P.E. Bourret); 1, 1887-88, p.67S; 2, 118, p.300.

Apatite in shades of green, blue red or grey and often semi-translucent, found in the workings and waste dumps of the North-Star Mine. Zircon in small crystals, cherry red and transparent are mentioned as occurring in this township in ranges XII and XIII, lots 21-23.

Range V, lot 9.

Ref.: 1, 1880-82, p.13GG.

Sphène occurs on this lot.

Range XI, lot 12,

Range XIII, lot 13.

Ref.: 3, 74, p.195.

Rutile has been found in good crystals on these lots.

Range XII, lots 13, 14, 21.

Ref.: 2, 118, p.296; 1, 1877-78, p.31G.

Scapolite reported.

VILLENEUVE Township, Papineau county.

Ref.: 1, 1887-88, p.67S and 75S.

Peristerite, the opalescent variety of albite is said to occur in this township in specimens showing beautiful blue color. The red (rubellite) variety of tourmaline and also green crystals are reported from this township.

WAKEFIELD Township, Gatineau county.

Ref.: 3, 74, p.232; 1, 1887-88, pp. 66S, 68S, 76S, 79S; 1, 1880-82, p. 13GG; 9, XVI, p.229-A.

Several semi-precious minerals are reported from this township. Uvarovite in crystals up to one half inch in diameter in range IV, lot 29. Grossularite associated with essonite, idocrase and pyroxene; apatite in various shades of brown, brick-red or deep green; spinel in pink and dark bluish crystals and blue cubes nearly an inch in diameter found in range X, lot 16, sphene in range I, lot 7, crystals of pink and green tourmaline in range VII, lot 25, small green prisms of vesuvianite in range I, lot 14, ((, IV, p.64T), and zircon crystals (1, 1882-84, p.192).

WENTWORTH Township, Argenteuil county.

Range VII, lot 24.

Ref.: 5, 1936-C, p.24.

J.J. Charbonneau has prospected for gem materials on this lot around 1936. "Sphene, apatite, scapolite, calcite and vesuvianite fill spaces between diopsite crystals". The latter mineral is clear with a pale lilac color, it could be used as gem material and also the vesuvianite which is known locally as laurelite from the nearby town of Laurel, it has a topaz-like appearance.

WRIGHT Township, Gatineau county.

Range A, lot 6.

Ref.: 2, 118, p.296.

Scapolite reported.

YAMASKA Seigniory, Rouville county.

Yamaska mountain

Ref.: 9, IV, 62T.

Sphene crystals reported.

GRANITES FOR BUILDING AND ORNEMENTATION

Granites are essentially igneous rocks composed of quartz and feldspar with a third mineral that may be a mica or a ferromagnesian; some fourty other minerals may be present as accessories.

The quarryman and monument maker calls granite any rock that is plutonic although it may be a syenite, an anorthosite or a diabase. The important point is that all these rocks have about the same physical properties of hardness and resistance although the quarryman finds it more difficult in general to extract blocks from a quarry which does not contain a true granite.

Quebec has always produced more granite than all the other provinces combined, the current figure is 80% of the volume and 90% of the value of the whole production of Canada.

Most of the production has come from various areas in the Eastern township where many shades of grey granite are quarried; coloured granites come from the regions of Grenville, Guénette, Rivière à Pierre, Chicoutimi and lake St.John. Black granites are quarried in the lake St.John area; the Monteregian Hills in southern Quebec have yielded granites at various intervals.

The list of producing areas inactive or not is given in table form, the reader should consult the many references given for more detailed information.

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1 - Canada Dept. of Mines, Mines Branch, publ. no. 279, (1914).

2 - Quebec Bureau of Mines, Ann. Rept., 1931, part E.

3 - Quebec Bureau of Mines, Ann. Rept., 1932, part E.

4 - Quebec Bureau of Mines, Ann. Rept., 1933, part E.

5 - Canada Dept. of Mines and Technical Surveys, Mines Branch, publ. no. 846, 1955.

6 - Quebec Dept. of Mines, unpublished report by O.-D. Maurice.

7 - Office files.

8 - Quebec Bureau of Mines, Ann. Rept.

9 - Quebec Department of Mines, Geological Report no.

10 - Mines and Minerals 1889-90.

Township or Seignory and county	References	Range	Lots	Operator	Active period	Colour	Texture	Remarks
ALTON (Portneuf)	7, O.D. Maurice (1953)	IV	13b	Roland Bertrand	1952-53	Red	Fine grained gneissic	Suitable for residences.
BAGOT (Chicoutimi)	4, p.53	At Bagotville		- -	- -	Pink	Coarse grained	Used in Academy St-Louis.
	4, p.53	At Port Alfred		City of Port Alfred	- -	Pink	Coarse grained	Used in City Hall at Port Alfred
	4, p.53	IV N.W.	7	- -	- -	Pink	Coarse grained	Same as Bagotville quarry
BARNSTOWN (Stanstead)	1, p.169	II	24, 25	Stanhope Granite Co.	Short period in early 1900's	Grey	Medium gr.	No production
	6, p.62; 2, p.80.	V	14	H.L. Cleveland	1856-1928	Grey	Medium gr.	Used in a convent at Coaticook
	2, p.73; 6, p.61.	X	21-22	Frontenac Quarries Ltd.	1927-1929	Grey	Medium gr.	Used in a convent at Sherbrooke
	2, p.71; 6, p.59; 5, p.112.	X	26	Gingras & Frères Ltée (Granite Stanhope Ltée)	1891 at present	Grey	Medium gr.	Used in many buildings
	2, p.73; 6, p.61.	X	27	Amédée Beaudoin	around 1930	Grey	Medium gr.	Used for monument bases
BEAUCHASTEL (Rouyn-Noranda)	5, p.74; 6, p.155.	I	42,43, 46,47.	Canada Black Granite Ltd.	1945	Black	Fine and Medium gr.	Diabase, used mostly for monuments
BEAUPRE, Côte de (Charlevoix)	8 p.109(1915) (Fr. c.d.)	Baie-St-Paul, St-Lazare	452	none	- -	Black	Coarse gr.	Anorthosite, interesting location.
BOIS (Portneuf)	3, p.19; 6, p.119.	I	3	Genois & Jobin	1915-1923	Grey	Coarse gr.	Monuments and curb-stone

Township or Seignory and county	References	Range	Lots	Operator	Active period	Colour	Texture	Remarks
BOIS (suite)	3, p.20; 6, p.119.	I	5-6	Various	1894-1960	Blue-grey	Coarse gr.	Four quarries at this location.
	3, p.22; 6, p.119.	I	7	Voyer & Frères	1903 - ?	Blue-grey	Coarse gr.	Used for the Arsenal in Quebec.
	3, p.24; 6, p.121.	I	12	J.B. Voyer	1895-1914	Pink	Medium gr.	Used in buildings especially churches.
	3, p.26; 6, p.125.	I	14	Fortunat Voyer	1894-1920	Grey-pink	Coarse gr.	St. Roch church in Quebec.
	3, p.28; 6, p.123; 7, O.D. Maurice (1950)	I	15-16	Dumas & Voyer and others	1915 - present	Pink	Coarse gr.	Soldiers' monument in Ottawa.
	7 (Inspection Reports)	I	20	White Diamond Granite	1962-present	Green	Coarse gr.	Little activity.
	7 (P.E. Bourret, 1968)	I	31-32	Martineau & Deschambault	1962-present	Green	Coarse gr.	For buildings and monuments.
	3, p.22; 6, p.120.	II	5-6	Dumas & Morel, Perron & Delisle,	1923-present	Grey	Coarse gr.	Four quarries on these lots.
	3, p.24.	II	12	J.B. Voyer	1896-1914	Pink	Medium gr.	Two quarries on this lot.
	3, pp.31-33;	II	14, 15	A. Perron, F. Nolet, I. Thibodeau, S. St-Pierre,	1929-present	Pink-grey	Coarse gr.	Five quarries on these lots.
	7, (1915)	II	16	A. Delisle	1915- ?	Pink	Coarse gr.	For curb-stone
	1, p.139; 3, p.34; 6, p.128.	III	13	M.D. Davis, A. Dumas White Diamond Granite	1907-1960	Grey	Coarse gr.	For several important buildings
	Insp. Rept. 1964-1969	III	15	Granite Rivière-à-Pierre Inc.	1964-present	Grey	Coarse gr.	For buildings

Township or Seignory and county	References	Range	Lots	Operator	Active period	Colour	Texture	Remarks
BOIS (suite)	3, p.37; 6, p.128.	III	21	Desantes & Voyer, H. Laroche; Dumas-Voyer	1930-Present intermittently	Grey	Coarse gr.	For church at La Tuque
	7, (P.E. Bourret) 1969	IV	18-19	Leo Lavoie	1969 -	Brown	Coarse gr.	Opened in 1969
BOURG-LOUIS (Portneuf)	7 (L. Lachance) 1956	III S.W.	714 715	Frenette & Boilard Canadian Stone Reg'd.	1956-1961	Grey-pink	Medium gr. gneissic	For residences 2 quarries
	6, p.161.	IV, S.W.	739	Marvel Granite	1946-1962	Grey-pink	Medium gr. gneissic	For residents
BOYER (Labelle)	3, p.46	V	37	Brodies' Limited	1939-1956	Grey-pink	Fine gr. gneissic	Suitable for curbing and building
	7 (A. Deland) (1958)	VI	32A-33	C. Delaniello	No operation	Pink	Fine gr.	Some exploration done
BROME (Brome)	2, p.128; 6, p.143.	I	18-19	- -	No operation	Dark grey	Medium gr.	Possible quarry site
	1, p.183; 1, p.184; 6, p.143.	I	26	W.E. Jones	Before 1914	Light brown	Medium gr.	For church in West Shefford.
	2, p.128; 6, p.143.	III	17	- -	No operation	Dark grey	Medium gr.	Possible quarry site
	2, p.126.	IV	16-17	- -	Before 1931	Dark grey	Medium gr.	From boulders and solid rock.
	2, p.126.	IV	27	James Hays	About 1888	Grey-pink	Medium to coarse gr.	Used in bridge abutements.

Township or Seignory and county	References	Range	Lots	Operator	Active period	Colour	Texture	Remarks
CAMPBELL (Labelle)	3, p.47; 6, p.107.	A	1a et 1b	Guenette Granite, Atlas Granite, Melrose Granite, Fairmont Granite.	1930 - present	Pink	Medium gr.	Mainly monument stone.
	1, p.145; 3, p.42; 6, p.106.	A	4-5	Brodies' Ltd. Fairmont Cr. Ltd.	1919 - present	Pink	Fine gr.	Especially for monuments.
	7, (R. Paquet) 1961	A	6	Laurentian Granite	1960	Pink	Fine gr.	Monuments.
	7, (P.E. Bourret) 1956	A	15	J.A. St-Pierre	No operation	Dark-grey	Fine gr.	Exploration only.
	1, p.145; 3, p.42; 6, p.109.	B	5,6	M. Poisson, J.A. St-Pierre; Canadian Pink Granite.	1913 - present	Pink	Fine gr.	For monuments, 2 quarries.
	7 (O.D. Maurice) 1954; (A. Deland) 1958;	B	7,8	Green Valey Granite, Laurentian Granite.	1954-1962	Pink	Medium gr.	Monument stone.
	3, p.42; 9, 23, p.48; 6, p.112.	C	1b	Provencher Quarry	1913 - ?	Grey	Fine gr.	Paragneiss
	6, p.111	C	8	Laurent Paquin	1951-53	Pink	Medium gr.	No production recorded.
	3, p.49; 6, p.112.	I	24	J.A. Matte	1928-29	Pink	Coarse gr.	Used for the Cathedral at Mont Laurier.
CAP-DE-LA-MADELEINE (Champlain)	4, pp.25-26	Des Grès	158-160	Louis Bertrand	?	Grey-red	Coarse gr.	Auger type granite suitable for decoration but not used as such.

Township or Seignory and county	References	Range	Lots	Operator	Active period	Colour	Texture	Remarks
CAP-DE-LA-MADELEINE (Suite)	4, p.26	Des Grès	163	Cité de Shawinigan	1925-1935	Green	Medium gr. porphyritic	Used for construction.
CHATHAM (Argenteuil)	1, p.150; 3, p.62; 6, p.103.	VII	13,14,15	Argenteuil Granite Co Ltd.	Before 1930	Brownish-red	Medium gr.	Used for paving stones and buildings
	1, p.147; 3, p.59; 6, p.102.	VII and VIII	13,14,15	Jos Brunet, Laurentian Granite.	1892-1939	Pink, brown and blue-grey	Medium gr.	Used in several buildings.
	3, 3,p.58; 6,p.103.	VIII	16	Wm. Kennedy	Before 1930	Brown to grey	Medium gr.	Used in Presbyterian church at Lachute.
	3, p.57.	VIII	17	Wm. Johnson	Before 1930	Grey	Fine gr.	For curb-stone
	3, p.57.	VIII	18	Jos Lacasse	Before 1930	Grey	Medium gr.	For curb-stone
	6, p.100	VIII	28	Normand Dubé	In 1951	Red	Medium gr.	Small production
	3, p.56; 6, p.103.	IX	18	Lucien Bérubé	1929-1948	Grey-green	Medium gr.	Curb-stone and monuments.
CHICOUTIMI (Chicoutimi)	4, p.50; 6, p.138.	III N.E.	22	Delwaide & Goffin Riverin & Riverin	1930-1932	Grey-green	Medium gr.	For buildings and monuments.
	4, p.52; 6, p.137.	VIII S.W.	14	Delwaide & Goffin	1929	Pink	Medium gr.	Bases of monuments, 2 quarries
CLYDE (Labelle)	7, (P.E. Bourret)1961	D	8	St. Lawrence Granite Corp.; Stanstead Granite Corp.	1959-61			
COLBERT (Portneuf)	3, p.18; 6, p.118.	XII	51	J.B. Voyer; Honoré Dubois .	1901 - 1946 intermittently	Grey	Coarse gr. gneissic	Curbstone and monuments
	3, p.17; 6, p.117.	XII	52	Quebec Granite Co.Ltd La compagnie de Granit.	1931-1934	Grey	Coarse gr. gneissic	Church at Giffard

Township or Seignory and county	References	Range	Lots	Operator	Active period	Colour	Texture	Remarks
DE L'ILE (lake St-John)	6, p.131; 5, p.95.	II	16	National Granite Ltd	1942 - present	Pink	Coarse gr.	Many buildings
	6, p.152.	IV	49	Silver Granite Corp.	1953-1955	Black	Coarse gr	For monuments
	7,(R. Paquet) 1961	V	48,49	Floral Granite and Lavoie & Fils	1961 - present	Black	Coarse gr	For monuments, 2 quarries.
DUHAMEL (Temiscamingue)	4, pp.9-10 6, p.166	I, II	Pointe au Vin et Pte au Cèdre	Janal Inc.	1958 - present	Wine-red	Medium gr	For monuments.
ESCOUMAINS (Saguenay)	4, p.80; 6, p.163; 8, 1929, p.88D.	A	4	- -	- -	Pink	Medium gr. gneissic	Churches at Escoumains and Trois Pistoles.
FARNHAM (Brome)	1, p.183; 2, p.127; 6, p.143.	IV	3-6	- -	- -	Grey	Medium gr.	Catholic church in West Shefford.
FOSSAMBAULT (Portneuf)	7, (H. Girard) 1933	Par.Ste Catherine	277	- -	- -	Pink	Medium gr. gneissic	Used for construction.
GARNIER (Lac St.Jean)	7,(P.E. Bourret) 1964	II	4	National Granit	1962-present	Black	Coarse gr.	For monuments and construction.
	7,(P.E. Bourret)1964	II	5	Martineau & Deschambault	1964 - present	Black	Coarse gr.	Construction and monuments.
	6, p.153; 7,(P.E. Bourret) 1964	II -	7,8	Polycarpe Moreau, National Granite	1949 - present	Black	Coarse gr.	For monuments
GAYHURST (Frontenac)	2, p.95; 6, pp.71, 76, 77.	VIII	1	Silver Granite, Everlasting Granite, St. Samuel Granite.	1924 - present	Grey	Medium gr.	For construction and monuments (3 quarries)

Township or Seignory and county	References	Range	Lots	Operator	Active period	Colour	Texture	Remarks
GAYHURST (Frontenac)	6, p.74.	IX	5	Bussière & Frères Enr.	1946 - 1956	Grey	Medium gr.	Many buildings
	2, p.98; 6, p.80.	IX	11-14	Bussière & Frères Enr	1921 - 1945	Grey	Medium gr.	Four quarries, many buildings.
	1, p.166	X	3	Alfred Labonté	Around 1910	Grey	Medium gr.	Small production
	6, p.80.	X	14	Bussière & Frères	1938 - 1946	Grey	Medium gr.	For buildings
GRENVILLE (Argenteuil)	6, pp.98,101	IV	7b,8	Canadian Red Granite Scotstown Granite	1946 - 1961	Red	Coarse gr.	For buildings and monuments
	6, p.99.	V	3a, 3b	Gaboriault & Nevers	1937 - present	Red	Medium gr.	For monuments
	6, p.96	VI	2	Scotstown Granite Co.	1940 - 1948	Red	Medium gr.	For buildings and monuments.
HAMPDEN (Compton)	2, p.87; 6, p.145.	I	45, 46	A.M. MacKenzie and M.M. Morrison Scotstown Granite Co.	1949 - 1950	Dark green	Medium gr.	For monuments.
	7,(O.D. Maurice) 1954	II	46	Scotstown Granite Co. Victoria Mountain Granite	1949 - 1954	Dark green	Medium gr.	For monuments.
	7,(O.D. Maurice) 1954	II	45	Silver Granite Corp.	1954 - 55	Dark green	Medium gr.	Building and monuments.
HEREFORD (Compton)	2, p.78; 6, p.62.	V	21	- -	1890's	Grey	Medium gr.	St. Herménégilde church.
HUNTERSTOWN (Maskinonge)	Notice of opening	St.Alexis des Monts	343	Lavoie & Gélinas	Sept. 1969	-	-	-
	Insp.Repts 1967-69	Near St.Alexis des Monts		Martineau & Deschambault	1967 - present	Brown	Coarse gr.	Monuments
ILE D'ALMA (Lac St-Jean)	4, p.44	I	4	- -	- -	Grey	Fine , gneissic	Church of St. Joseph d'Alma.

Township or Seignory and county	References	Range	Lots	Operator	Active period	Colour	Texture	Remarks
ILE D'AIMA (Lac St.Jean)	Insp. Rept. 1955	III	16b	National Granite	1955	-	-	- -
JONQUIERE (Jonquière)	4, p.54; 6, p.137.	North	5	- -	- -	Red	Medium gr.	Church at Kenogami.
LABARRE (Lac St.Jean)	4, p.41. 6, p.154.	IV	7	- -	Early 1900's	Black	Coarse gr.	Church at St. Bruno (in part)
	4, p.41	V	8	Bernier & Fils	- -	Black	Coarse gr.	Small production.
LAC DES DEUX MONTAGNES (Deux-Montagnes)	1, p.151; 3, p.63; 6, p.158.	Riv. du Nord	18	V. Lebeau	1909 - 1937	Pink	Fine gr. gneissic	Church of Ste. Anasthasie (1936)
LAMOTTE (Abitibi-East)	6, p.166. 7(R. Paquet) 1960	V VI	44-45 42-43	Golden Valley Granite Co. Ltd.	1951	Pink	Fine gr.	No production
LANGELIER (Laviolette)	6, p.160; 7(O.D. Maurice) 1955	East	46	T.A. Bouchard	1953 - ?	Pink	Medium gr. gneissic	Small production
LA SARRE (Abitibi West)	7(R. Taschereau) 1930	V		L. Boisvert, Gingras & Frères	1928 - 1940	Red	Coarse gr.	Church at La Sarre
LATHBURY (Papineau)	7(O.D. Maurice) 1966; (R. Sirois) 1968	I	12-14	Frs. Bourgeois	1966	Black	Fine gr.	For monuments.
LINGWICK (Compton)	2, p.87; 6, p.65.	I	17b	- -	Before 1900	Grey	Fine gr.	For bridges
	2, p.84; 6, p.65.	D	40	Scotstown Granite Co. Ltd.	1880 - present	Grey	Fine gr.	Numerous buildings
	2, p.87.	H	15	- -	- -	Grey	Medium gr.	No production, good location.

Township or Seignory and county	References	Range	Lots	Operator	Active period	Colour	Texture	Remarks
LYNCH (Montcalm)		IV	27	G.H. Parent	1951 - 1957	Pink	Fine gr.	For monuments
MARCHAND (Labelle)		Rivière-Rouge	65	Robert Parent, Brique et Pierre Provinciale Inc.	1959 - present	Grey	Medium gr.	For buildings.
METABETCHOUAN (Roberval)	4, p.44; 6, p.136.	I	1	Eugène Robitaille	1927	Pink	Coarse gr.	Church at St.Jerome
MILLE ISLE (Terrebonne)	1, p.151.	One mile N.E. of St. Jerôme		B. Germain	Before 1914	Red	Medium gr. gneissic	Small production
MILOT (Roberval)	7, L. Duchesne(1968)	III	76-77	Milot Granite Inc.	1968 - present	Red	Fine gr.	For monuments.
	7, P.E. Bourret (1963)	VI	20-23	Beebe Granite Works Ltd.	1963 - present	Black	Fine gr.	For monuments.
	7, R. Béland (1967)	VII	23 E½	Lecarme Granite Inc.	1967 - present	Black	Fine gr.	For monuments.
MONNOIR (Iberville)	1, p.175; 2,p.112-116; 6,p.141-142.	Mount Johnson		Fairmont Granite, Brodies Ltd. Nadeau & Gadbois.	1899 - present	Dark grey	Medium gr.	For monuments.
MONTAUBAN (Portneuf)	Insp. Repts. 1959-1968	VI	I	Martineau & Deschambault,	1959 - present	Blue-grey	Medium gr.	For construction and monuments.
	3, p.38; 6, p.129.	VII	6	Lavoie & Doyer	1929 - 1936	Pink	Coarse gr.	For monuments.
	3, p.39; 6, p.129.	VII	7	Georges Cochon	1930	Pink	Coarse gr.	Small production.
MONTBEILLARD (Rouyn-Noranda)	7, P.E. Bourret (1947)	IX	12-15	- -	- -	Black	Fine gr.	No production
MONTREUIL (Rouyn-Noranda)	6, p.164; 7, P.E. Bourret, (1949)	I	31	Super Service Inc.	1946 - 1947	Pink	Fine gr.	Church at Dupuy.

Township or Seignory and county	References	Range	Lots	Operator	Active period	Colour	Texture	Remarks
NEUVILLE (Portneuf)	7, O.D. Maurice (1952-1953)	4 miles N.W. of Pont-Rouge		Rosaire Boilard Ovila Suzor	1952 - 1967	Greyish Pink	Coarse gr. gneissic	For crazy work
NOTRE-DAME-DES-ANGES (Quebec)	7, P.E. Bouret (1952)	St-Pierre	639	Alphonse Bédard	?	Pink	Medium gr. gneissic	For construction at the Zoo
	6, p.102; 7, O.D. Maurice (1951)	St-Pierre	640	Charlesbourg Quarry Silver Granite Corp.	1920 - 1922	Pink	Medium gr. gneissic	For construction
ROBERVAL (Roberval)	4, p.33; 6, p.134.	B	3	Polycarpe Moreau	1931 - 1932	Dark pink	Coarse gr. gneissic	Church at Roberval
	4, p.34; 6, p.135.	B	4	Auguste Bernier	1908 - 1932	Pink	Coarse and fine gr.	City Hall at Roberval
ROCHON (Labelle)	1, p.145.	VI	2	Brodies' Ltd.	Not worked	Light Pink	Fine gr.	
ST-HYACINTHE (Rouville)	2, p.131; 6, p.144.	III	383 (St.Paul)	C.P.R.	1880'S	Light Grey	Medium gr.	Used for bridges
SHAWINIGAN (St.Maurice)	Insp.Repts 1949-1969	XIX	13	Elie Grenier	1949 - present	Grey	Medium gr. gneissic	For residents
SHEFFORD (Shefford)	2, p.123; 6, p.142.	IV	4, 5	No production	- -	Grey	Medium gr.	Possible sight.
	2, p.121; 6, p.142.	V	6	John Dounan C.J. Hill	Around 1900	Light brown	Medium gr.	For buildings and monuments.
	2, p.122;	V	13	Morrisseau Quarry	In 1880	Dark grey	Medium gr.	Church at Waterloo
SHIPTON (Richmond)	2, p.106-107	V	12	Robitaille Brothers	1920's	Greenish-grey	Medium gr.	For monuments, small production
SIGNAY (Lac St-Jean)	4, p.42.	VI	34	Black Granite Co.	1930-1931	Black	Coarse gr.	For monuments.

Township or Seignory and county	References	Range	Lots	Operator	Active period	Colour	Texture	Remarks
SIGNAY (suite)	6, p.152.	VII	31	Silver Granite Corp.	1939 - 1948	Black	Coarse gr.	For monuments
	4, p.43; 6, p.154.	VII	32	Polycarpe Moreau	?	Black	Coarse gr	For monuments
	4, p.42	X	23	Bernier & Fils	Before 1930	Black	Coarse gr	For monuments, small production.
	4, p.43; 6, p.150.	X	31A	National Granite Ltd	1930 -1961	Black	Coarse gr	Numerous buildings and monuments.
SIMARD (Jonquière)	6, p.132;	I	6A	National Granite Ltd	1952 - present	Chocolate brown	Corase gr.	Buildings and monuments.
STANSTEAD (Stanstead)	2, p.66.	I	12	C.W. Colby	Before 1930	Grey	Medium gr.	Small production
	10, p.155.	III	2	Haselton & Moir	1888	Grey	Medium gr	For building and monuments.
	1, p.161; 2, p.35.	IV	1	Wm. Haselton	1927 - 1951	Dark grey	Medium gr.	For monuments and curb-stone
	2, p.34.	IV	2	A.C. Hartley	1929 - 1930	Grey	Medium gr	For curb-stone
	1, p.160; 2, p.28; 6, p.47; 10, p.155.	IV	3	Brodies' Ltd	1898 - present	Grey	Medium gr.	Numerous buildings
	2, p.58.	IV	6	G.O. Bullock	Around 1930	Grey	Medium gr.	For curb-stone
	2, p.31; 6, p.55.	V	1	Berry & Redicker	1921 - 1940	Grey	Medium gr.	City Hall at Beebe
	2, p.60; 6, p.54.	V	2	Brodies' Ltd.	1890 - 1930	Grey	Medium gr.	Many buildings, Sun Life Building
	2, p.59; 6, p.44.	V	3	Stanstead Granite Quarries; Fairmont Granite Co.	1880 - present	Grey	Medium gr.	Numerous buildings, Sun Life Building

Township or Seignory and county	References	Range	Lots	Operator	Active period	Colour	Texture	Remarks
STANSTEAD (Stanstead)	1, p.161; 2, p.62.	V	4	W. Bullock	1919 - 1944	Grey	Medium gr	For curb-stone and paving blocks
	2, p.53.	VI	1	Durocher & McCoy	Around 1930	Grey	Medium gr	For curb-stone
	2, p.47; 6, p.52.	VI	2	Haselton Granite Quarries Lacasse & Boulais	1917 - present	Grey	Medium gr	Monuments and buildings
	2, p.47; 6, p.53.	VI	3	Albert Desrosiers House Hill Granite	1928 - 1936	Grey	Medium gr	Curb-stone and paving blocks.
	2, p.43; 6, p.49.	VI	4	R.L. Cloutier Robert McIntosh	1924 - 1962	Light grey	Medium gr	For buildings and monuments.
	2, p.40; 6, p.50.	VI	5	Adru Granite Inc. Frank Wilkinson	1923 - present	Grey	Medium gr.	For buildings and monuments.
	2, p.65	IX	6	Joseph Verdun	1931 - ?	Grey	Medium gr.	For curb-stone.
STRATFORD (Wolfe)	6, p.88; 7,(R. Paquet) 1958	VI	21-22	White Diamond Granite Co. Ltd.	1946 - present	Light grey	Medium gr.	For buildings and monuments.
	Insp. Repts	VII	9	Eternit Granite Cyrille Lacroix	1961 - present	Light grey	Medium gr.	For monuments and construction.
	6, p.85; 7 (R.Paquet) 1958.	VII	21	Deschambault Quarry Corp.	1936 - present	Light grey	Medium gr.	For buildings and monuments.
	2, p.103; 6, p.90.	VII	22	Plamondon Granite Co. Ltd.	1928 - 1930	Light grey	Medium gr.	For monuments
TAILLON (Lac St-Jean)	6, p.154; 7 (P.E. Bouret) 1947	III	14	Polycarpe Moreau	1946 - 1950	Black	Coarse gr.	For monuments
WHITTON (Frontenac)	7 (R.Paquet) 1963	IV	30-35	Everlasting Granite Co.	Around 1963	Grey	Medium gr.	For monuments

Township or Seignory and county	References	Range	Lots	Operator	Active period	Colour	Texture	Remarks
WHITTON (Frontenac)	1, p.164; 2, p.99.	IV	34-35	Megantic Granite Co. Lacombe & D'Allaire	Around 1914	Grey	Medium gr.	For monuments
	2, p.93; 6, p.74-79	IV	36-37	Bussières & Fr. Enr.	Around 1920	Grey	Medium gr.	For buildings and monuments.
	6, p.78.	IV	37 N.E.	Antonio Bolduc	1940 - 1959	Light grey	Medium gr.	For monuments.
	1, p.167; 2, p.97.	V	23	Fitzgerald Quarry	Before 1914	Grey	Medium gr.	For monuments.
	2, p.100; 6, p.81.	V	26	Marbre et Tuile de Québec; Dostie and Trépanier.	1943 - 1945	Grey	Medium gr.	For buildings.
	6, p.79.	V	36-37	Bussières & Fr. Enr.	1941 - 1948	Grey	Mesium gr.	Numerous buildings.

GRAPHITE

Carbon occurs in nature in the hexagonal system as graphite and in the cubic system as diamond. While diamond is the hardest mineral in existence, graphite is one of the softest.. The main physical properties of graphite are its black color and streak, its metallic luster its perfect basal cleavage and its unctuous feel. It is an excellent conductor of heat and electricity, melts at a temperature of about 3500°C and is inert to chemical reagents and weathering.

Three main types of natural graphite are sold on the market: lump, flake and amorphous. The highest prices are commanded by lump graphite (also called crystalline or plumbago) and flake graphite. The so called amorphous graphite is in reality a very fine grained crystalline product.

Graphite is also sold as a manufactured product obtained from the baking of petroleum coke at 950°C and and then graphitizing at 2800°C.

Production in Canada has never been important; the last production in Quebec was in 1963 when O. Clot Graphite Mining Ltd. sold about 2 tons at 35¢ per pound to rubber manufacturers. The best year was 1917 when about 1,000 tons were produced in Quebec having a value of about $100,000. Artificial graphite is manufactured at Berthierville by Great Lakes Carbon Corporation Ltd.

Canada imports less than three million dollars worth of natural graphite per year principally from the United States who imports it in turn from Mexico, Ceylon, the Malagasy Republic and other nations.

In the United States graphite is used mainly in foundry facings, in refractories, in steelmaking and in crucible, retorts stoppers, sleeves and nozzles. Batteries, brake linings, lubricants, pencils also account for a good percentage of the consumption.

The Grenville subprovince furnishes all the more important occurrences of graphite in Quebec, the older producing mines were all situated in the Grenville, Chatham and Wentworth townships of Argenteuil county. More recently attemps have been made to develop deposits in Joly, Bouthillier, Boyer and Campbell townships in Labelle county, McGill and Amherst townships in Papineau county.

The price of graphite varies considerably depending especially on size of grains and per cent carbon content, most often it is a result of negotiation between buyer and seller. It is often difficult to introduce graphite from a new source into the market because the buyers are generally reluctant to change supplier when the latter has given satisfaction.

The E. & M.J. quoted prices varying from $85. to $612. per short ton for crystalline graphite from different sources in 1966.

Amorphous graphite with 80-85 per cent carbon sold for $15. to $22. per short ton, the latter quotation includes the cost of bagging.

PRINCIPAL REFERENCES

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(2) Graphite, its properties, occurrences, refining and uses: Can. Dept. Int., Mines Br. no. 18, 307 pp., 1905 by F. Cirkel.

(3) Graphite deposits of Quebec: G.S.C. Ann. Rept. 10, S-66-73, 1898 by A.A. Cole.

(4) Mining Operations in the Province of Quebec.

(5) Mining Industry of the Province of Quebec.

(6) Office files

(7) Transactions Can. Min. Inst. vol. XV, 1912, pp. 261-269.

(8) Department of Mines, Quebec, Geological Report no.

(9) Department of Mines, Quebec, Preliminary Report no.

(10) Quebec Bureau of Mines, Annual Report.

LIST OF OCCURRENCES

AMHERST Township, Papineau county.

Range V, lots 12 to 14.

Ref.: 6, (1955)

Ametal Mining Corporation Limited did some development work on this prospect in 1955. Graphite is associated with feldspar and quartzite in two zones 1200 feet apart. One of the zones was uncovered over a length of 50 feet and a width of 5 to 10 feet.

Range VI, lots 11 to 14.

Ref.: 4 (1917, p.58; 1920, p.56; 1923, p.71); 6, (A.O. Dufresne, 1920; P.E. Bourret, 1960).

Assessment work was done on these lots in 1917 by Graphite Products Limited and in 1923 by Gédéon Fredette. In 1960, Guy Clement and Foster Wightman uncovered the old workings on lot 12. Flakes and lumps of graphite are found in crystalline limestone over a length of 100 feet.

Range VI, lots 15 to 17.

Ref.: 1, p.46; 2, p.42; G.S.C. Memoir 113, p.39; 4, (1910 to 1922); 6, (A.O. Dufresne, 1920; P.E. Bourret, 1960); 7.

This deposit was discovered in 1907 by P. Tétreault and H. Roy. From 1909 to 1913, Graphite Limited did some development work and constructed a mill. In 1916, an option was taken on this property by Multiplar Syndicate but their operation lasted only a few weeks. The total production during those years was 126,000 pounds valued at $5,400. Intermittent operations continued until 1921 by Graphite Limited and by Laurentian Graphite Co. Ltd.

Irregular bodies of graphite ore are enclosed in limestone; most of the ore consists of foliated graphite intimately mixed with other minerals such as wollastonite, diopside, titanite, feldspar and scapolite. The ore body has been developed by a shaft 125 feet deep with levels at 40, 80 and 125 feet. According to Cirkel (Ref. 7) the graphite bearing zone has been traced over a distance of over two miles with maximum widths attaining 200 feet.

BELLEAU Township, St. Maurice county.
Between lakes Maxime and Ringuette
Ref.: 6 (A.O. Dufresne, 1919).

A lens of graphite bearing paragneiss has been traced over a length of 150 feet and widths varying from 21 to 28 inches.

BOUTHILLIER Township, Labelle county.
Range IV, lots 21-23
Ref.: 8 (no. 23, p.51)

Graphite flakes regularly distributed in parallel planes through limestone.

Range VI, lots 34-36
Ref.: 6 (P.E. Bourret, 1961, 1962, 1965).

This deposit was discovered in 1956-57 by Phrase Arbic and L.V. Larue of Mont Laurier. Italia Copper Limited took over the property in 1957 and did a considerable amount of development work consisting of stripping and about 720 feet of diamond drilling.

Graphite is found mostly in limestone in the form of lenticular masses. The main zone is 150 feet long and 30 feet maximum width. A chip sample collected by P.E. Bourret in 1958 over a width of 20 feet gave 14.23 per cent graphite on analysis. No production was recorded.

Range VI, lot 51

Ref.: 9, no. 187, p.11; 8, no. 50, p.29.

Some prospecting work was done on this lot in 1942 exposing a number of graphite veins within paragneiss. The graphite is pure and scaly but the veins are quite narrow and short.

BOYER Township, Labelle county.

Range VI, VII, lots 28-31

Ref.: 8, no 23, p.51; Can. Mines Br. publ. no 687, pp. 10-11.

This deposit was opened in 1922 by the Standard Graphite Co. and was taken over in 1924 by the Canadian Graphite Corporation who operated the mine until 1930 and sold graphite from reserves until 1935. A total of about 1,200 tons of graphite were sold for about $90,000. during the time of operation. An unsuccessful attempt was made in 1954 by a group called Thero Metals Ltd. to revive the property.

The graphite mineralization is irregular and usually disseminated within a biotite paragneiss. Rich concentrations occur occasionnally; the average grade is said to be from 15 to 20 per cent.

BUCKINGHAM Township, Papineau county.

Range IV, lots 1-5

Ref.: 1, pp. 48-49; 4, 1914, p.29; 4, 1917, p.57.

Operations were almost continuous from 1912 to 1918, the mill, constructed in 1913 was modified in 1919 and production resumed for a few months from May 1920.

The ore occurs disseminated in a calcareous gneiss and is said to contain an average of 14 per cent graphite.

Range IV, lot 8 N½

Ref.: 1, p.49;

J.E. Hardman did some prospecting work on this lot in 1916 and uncovered good showings of flake and lump graphite.

Range IV, lot 23

Ref.: 1, p.52.

This deposit known as the Hogg lot was worked in 1917 by the Plumbago Syndicate. Flake ore occurs along the contact of gneiss with pegmatite.

Range V, lots 1, 2, 3.

Ref.: 1, p.50; 4, p.63, 1910.

This deposit, knowns as the Bell Mine was operated from 1906 to 1912. The ore occurs in a calcareous band enclosed in gneiss. Old workings can be traced over a width of 500 feet and a length of 2000 feet.

The average grade was 8 per cent graphite according to company reports. In 1950 - 1952, Frobisher Limited did exploratory and laboratory work on this deposit, some 26 holes were drilled totalling 5,265 feet. Company reports indicated a reserve of 185,100 tons of marketable ore.

Range V, lots 19 S½, 24.

Ref.: 1, p.50.

Ste. Marie Mine on lot 19 and St. Louis Mine on lot 24 were worked around 1865 by Mr. Labouglie. The ore occurs in crystalline limestone.

Range V, lots 20, 21

Ref.: 1, p.52; 4, 1910, p.65; 4, 1917, p.57.

This deposit known as the Dominion Mine was opened in 1910 by the Dominion Graphite Company. In 1914 the Plumbago Syndicate took over the property and operated the mine and mill until 1919.

The graphite occurs at the contact of limestone and gabbro and in disseminations throughout the limestone.

Range V, lot 23.

Ref.: 1, p.52.

The Stewart Pit contains a flat lying body of graphitic limestone; it was worked around 1917 by the Plumbago Syndicate.

Range V, lot 27.

Ref.: 1,p.53

This deposit "was worked around 1870 by West and Company who shipped twenty barrels of pure graphite".

Range VI, lots 22, 23S½

Ref.: 1, p.55.

These lots were owned by the Buckingham Company around 1875. Lump graphite as well as disseminated flake occur in association with a pegmatite dyke.

Range VI, lots 25, 26, 27.

Ref.: 1, p.53; 4, p. 64 (F), 1903.

Several openings were made on these lots from 1872 when Messrs Pugh and Weart did some work on lot 27 and shipped some 200 barrels of lump graphite. A mill was erected on lot 25 in 1891 and intermittent operations continued until 1903 by S.J. Weart and the Buckingham Company.

The graphite occurs at the contact of gneiss and pegmatite in the form of flake and lump.

Range VI, lot 28

Ref.: 1, p.54; 4, 1910, p. 62.

This deposit known as the North American Mine produced graphite intermittently from 1870 to 1912. The operators were Canada Plumbago Company from 1870 to 1875, the North American Graphite Co. from 1895 to 1901, the Anglo-Canadian Graphite Syndicate from 1904 - 1906 and the Buckingham Graphite Company from 1910 to 1912.

A series of parallel graphitic bands occur in a belt 300 feet wide and 2,000 feet long within sillimanite gneisses and quartzites.

Range VII, lots 21, 22 and 27 S½

Ref.: 1, p.55.

The Buckingham Company worked graphite deposits on these lots around 1875. Lump graphite is said to be abundant and of good quality.

Range VIII, lots 19, 20, 21.

Ref.: 1, p.55

This deposit known as the Walker Mine was opened in 1876 by the Dominion of Canada Plumbago Company and was active intermittently until 1906. W.H. Walker operated the mine from 1886 to 1896 and the Buckingham Graphite Company in 1906. There are more than 30 pits on the property which covered lots 19 to 21 in ranges VII, VIII and IX.

Graphite occurs in disseminated flake and in irregular veins associated with pegmatite and crystalline limestone.

Range IX, lot 4.

Ref.: 6, 1910.

Work was done on this property in 1910. The owner was Hon. J.E. Robidoux. A graphite bed 4 feet thick was uncovered by trenches and pit over a length of about 100 feet.

Range IX, lot 12 N½

Range X, lots 12C, 13B, 14B and C, 15B, 17A and B.

Some work was performed on lots 12, 13, 14, range X in 1865 by Mr. Miller and in 1892 by J. Claxton. The Diamond Graphite Company did some work from 1906 to 1910 and Peerless Graphite Company from 1910 to 1917. The Consolidated Graphite Mining and Milling Company took over the property in 1917 but did very little mining on these lots. The ore came mostly from range IX, lot 12 where flake graphite was mined in an open pit 100 feet long and 70 feet deep.

Range IX, lot 15B

Ref.: 1, p.57.

This deposit was worked in 1917 by Dr. Cummings. Narrow bands of graphite occur in gneiss and limestone over a length of 1,000 feet and a width of 100 feet.

CAMERON Township, Gatineau county.

Range IV, lot 48

Ref.: 1, no. 50, p.29; 1, p.61.

An inclusion of pyroxenite in limestone contains numerous graphite veins. Claims were staked on this lot in 1964 by Leopold Céré of Maniwaki but there is no record of work having been performed.

CAMPBELL Township, Labelle county.

Range E, lot 8.

Ref.: 4, no. 23, p.51.

A band of gneiss in contact with amphibolite and with inclusions of quartzite and limestone contains "an appreciable quantity of graphite in small flakes".

CLARENDON Township, Pontiac county.

Range XII, lots 8a, 8b N.W.

Range XIII, lots 8a, 8b, 7 N.W.

Ref.: 6, 1955.

In 1954-55, Dun Raven Mines did considerable work including geophysical surveys and diamond drilling on this property. Graphite occurs in disseminated flakes within paragneiss. More than 4 million tons of ore was proven having an average grade of 4 and 4.7 per cent graphite respectively in two separate zones. Metallurgical tests were able to produce concentrates of 60 per cent carbon.

The deposits extend northward into adjoining Thorne township.

CLYDE Township, Labelle county.

Range: Rouge River East, lots 26a, 27a

Ref.: Q.B.M. 1935-C, p.72; 6 (A. Deland 1960).

This occurrence was noted by F.F. Osborne in 1935. Some development work was done in 1960 by C. Delaniello. The graphite occurs disseminated in crystalline limestone and in narrow veins in pegmatites and limestone. A grab sample of the flake variety taken from one of the veins analysed 32.88 per cent graphite.

D'AILLEBOUT Seigniory, Joliette county.

Rouen Concession, lots 325, 326.

Ref.: 6 (P.E. Bourret, 1955).

In 1952-53, Arthur Héroux did some work on these lots to uncover an occurrence of graphite. The mineral occurs in fibrous and lamellar form within joints in sillimanite-garnet gneiss. Some calcite lenses have graphite disseminations averaging 1 per cent.

DUDLEY Township, Labelle county.

Range III near the Lièvre River

Ref.: 9, 187, p.11.

Fine specimens of graphite are reported from this locality by E. Aubert de la Rue.

EGAN Township, Gatineau county.

Range C, lots 56, 57.

Ref.: 8, no.23, p.51.

Gneisses with limestone and quartzite inclusions contains graphite in small flakes.

GORE Township, Argenteuil county.

Range III, lots 1A, 1B

Ref.: 1, p.46.

Graphite occurs in calcareous gneisses and schists. The occurrence is similar to that of Wentworth township to the west which was developed around 1911 by the Canadian Graphite Co.

Range IV, lot 5.

Ref.: 10, 1936-C, p.26

Locality mentioned.

GRENVILLE Township, Argenteuil county.

Ranges II, III, lots 16.

Ref.: 1, p.44; 4, 1906, p.46 (F).

The Calumet Mining and Milling Graphite Co. extracted graphite from these lots between 1901 and 1908. Lump graphite from veins 3 to 18 inches in width was the main product.

Range IV, lots 13, 14.

Ref.: 10, 1936-C, p.26.

This lot is mentioned as the property of Keystone Graphite Co.

Range V, lots 9 and 10

Ref.: 1, p.45

This deposit (on lot 10) known as the Miller Mine was probably the first graphite operation in Canada having been worked around 1845 by R.V. Harwood; there was a short period of activity around 1889 and in 1900 the Keystone Graphite Co. shipped 25 cars of lump graphite from this deposit.

The graphite is associated with wollastonite, vesunianite, garnet, titanite, pyroxene and calcite near the contact of crystalline limestone and an intrusive.

In 1899, some development work was done on the adjoining lot no. 9 to the east by the National Graphite Company.

Range X, lot 2 N½

Ref.: 10, 1936-C, p.26.

Locality mentioned.

GRENVILLE Augmentation, Argenteuil county

Range II, lot 3

Range IV, lots 8, 13, 14

Range VI, lots 1, 2

Ref.: 2, p.43; G.S.C. Ann. Rept. 1876-77, p.502.

Localities mentioned.

HARRINGTON Township, Argenteuil county.

Range I, lot 15.

Ref.: 10, 1936-C, p.26; G.S.C. Summ. Rept. 1916, p.214.

Locality mentioned.

Range IV, lot 7

Ref.: 6 (Leo Lachance 1955).

Some old workings are seen on this lot; graphite is present in flakes and in lumps as observed in specimens taken from the old dump. The mineralization which includes wollastonite occurs near an intrusive contact in a band of crystalline limestone.

HINCKS Township, Gatineau county.

Range XII, lot 20

Range XIV, lot 47

Ref.: 9, 235, p.5; 1, p.61.

Localities mentioned.

HULL Township, Gatineau county.

Range VII, lots 11, 12

Range IX, lots 9, 14, 15

Range XI, lot 9

Range XII, lot 9a

Ref.: 1, p.61; 6.

Localities mentioned.

JOLY Township, Labelle county.

Range N, lot 20

Ref.: 5, 1951, p.41; 5, 1952, p.49; 5, 1954, p.48; 6 (P.E. Bourret, 1951, 1952, 1958).

This deposit was discovered in 1907 by J.A. Bigonesse and worked intermittently by him until 1919. Some prospecting activity and staking took place in 1935, 1938, 1941, 1942 and 1948; in 1950 lots 20 and 21 were staked by Oscar Clot who transported his mining rights to Quebec Graphite Corporation in 1953. This company did a considerable amount of development work including diamond drilling in 1954. Concentration tests were made on some bulk samples of ore in 1961, these tests were made in a mill belonging to Canada Garnet Limited.

The ore body consists of veins with lump graphite and disseminations in a zone measuring some 200' in length and from one to fifteen feet in width. The country rock is pyroxenite and garnet gneiss with dolomite inclusions.

Production has been small except for the bulk samples extracted for concentration tests.

KIAMIKA Township, Labelle county.

Range VIII, lot 3

Ref.: 8, no. 23, p.52

Graphite occurrence in garnetiferous gneiss.

Range Nord du Chemin Chapleau, lot 16

Ref.: 8, no. 23, p.51.

Graphite in rusty weathering gneiss.

LOCHABER Township, Papineau county.

Range VIII, lot 23

Ref.: 1, p.58.

The Lochaber Plumbago Mining Company did some work on this property from 1864 to 1868. Irregular veins of graphite occur in crystalline limestone near a pegmatite dike.

Range X, lots 20, 21, 22

Ref.: 1, p.58; 6 (1941).

Good showings of graphite were found on lot 21 around 1864 by the Lochaber Plumbago Mining Company. In 1941, R.F. Kelly had some concentration tests made on samples from lots 21 and 22. Graphite is also reported from lot 20.

Range XI, lots 17, 17, 20-26

Ref.: 1, pp. 58 and 61; 6 (1952).

These lots are reported as containing good showings of graphite. In 1952, Frobisher Exploration had some bulldozing done on lot 20 belonging to Burke Brothers. A zone of flake graphite 3 to 10 feet wide was traced by trenches for a length of 400 feet, the graphite is disseminated in crystalline limestone the average grade being 10 to 15 per cent.

Range XII, lots 22, 23

Ref.: 1, pp. 58 and 61.

Lot 23 contains "a 10 foot band of flake graphite disseminated in limestone"; it was worked around 1864 by the Lochaber Plumbago Mining Company.

McGILL Township, Papineau county.

Range VI, lots 19, 20

Ref.: 6, (P.E. Bourret 1952, 1954, 1956, 1960).

This deposit was first worked in 1951 by Rodrigue Cyr. After passing through several hands it was acquired in 1956 by the New York and Honduras Rosario Mining Company who did a considerable amount of development work including about 800 feet of diamond drilling.

In 1967 and 1968, the Canastota Copper Mines Ltd. conducted a self-potential survey over the property which was followed by an elaborate programme of diamond drilling. Concentration tests were also made at the pilot plant of the Quebec Department of Natural Resources.

The work done so far has indicated the presence of a graphitic zone 25 feet wide and extending for a length of 375 feet. The grade at the surface is 20 to 25 per cent carbon. The mineralization is of the flake variety, disseminated in a limestone inclusion within quartzite.

MONTIGNY Township, Labelle county.

Range VII, lot 4

Ref.: 8, no. 23, p.50

Occurrence of graphite in a micaceous augite gabbro.

MULGRAVE Township, Papineau county.

Range V, lots 42-44

Ref.: 8, no. 33, p.24.

Graphite occurrence in paragneiss. Some development work was done in 1959 on lot 44 by Alfred Salagan; only small showings were uncovered.

NORTHFIELD Township, Gatineau county.

Range B, lots 14, 28, 29, 30.

Ref.: 4, 1898, p.29; 6 (M. Boyer 1930).

Lots 28-30 are mentioned in 1898 as containing graphite occurrences. In 1930, E. Bertrand did some work on a graphite showing on lot 14. Disseminated flakes are seen in a pegmatite and in a gneissic rock; a sample of the latter gave an analysis of 16.3 per cent graphite.

PETITE NATION Seigniory, Papineau county.

Range Précule, N.D. de la Paix municipality.

Ref.: 8, no. 33, p.34.

Graphitic paragneiss with about 10 per cent disseminated graphite.

SALABERRY Township, Terrebonne county.

Range I, near junction of Du Diable and Rouge rivers

Ref.: 10, 1935-C, p.72.

Flake and lump graphite are found in limestone inclusions within Grenville rocks.

SUFFOLK Township, Papineau county.

Ranges II, III, lot 39

Ref.: 8, no. 33, p.24

Graphite occurrence in paragneiss and crystalline limestone. The mineral is flaky and constitutes about 10 per cent of the rocks.

THORNE Township, Pontiac county.

Range I, lot 14.

This deposit is part of the property of Dun Raven Mines Ltd. described above in Clarendon township (p. 201).

WENTWORTH Township, Argenteuil county.

Range III, lots 1A, 1B

Ref.: 1, p.46; 4, 1912, p.34; 10, 1936-C, p.26.

Some prospecting work was done on this deposit as early as 1863 by the New England Plumbago Company. From 1911, the Canadian Graphite Company did a considerable amount of development work which culminated in a programme of diamond drilling and the driving of an adit in 1919.

Flake graphite occurs in disseminations within a calcareous gneiss which has been traced over a length of 600 feet and a width of 30 feet, the average content is said to be 15 to 20 per cent.

Range VIII, lot 23B, 23C, 24

Ref.: 4, 1928, p.167.

Graphite occurs in silicified bands of crystalline limestone.

WOLFE Township, Terrebonne county.

Range VIII, lot 40

Ref.: 6 (G.W. Waddington, 1946)

Angular fragments of graphite up to 3 inches in diameter and 1.5 inches thick were discovered in float during the coarse of plowing operations.

LITHIUM

The production of lithium in Quebec had a spectacular growth from 1955 to 1957, the decline was precipitated in 1959 when Lithium Corporation of America Inc. ended abruptly its contract with Quebec Lithium Corporation to buy 17,000 units of spodumene concentrates per month. In 1960, a new refinery was put into operation producing lithium carbonate and in 1963, lithium hydroxide monohydrate was being produced. Operations ceased in 1965 because of over supply and there is presently no plan to resume production until prices and markets improve. Some lithium salts and spodumene concentrate were sold in 1966 and 1967 from stocks.

The production and value of lithium production in Quebec from 1955 to 1967 inclusive is given in the following table.

TABLE I

Year	LiO_2 (pounds)	Value
1955	106,320	$58,480.
1956	4,789,360	2,643,950.
1957	5,140,257	2,827,143.
1958	3,853,322	2,047,880.
1959	2,756,280	1,422,153.
1960	204,666	84,135.
1961	536,190	392,871.
1962	499,736	558,654.
1963	644,354	682,029.
1964	1,056,408	1,155,282.
1965	1,013,565	1,141,426.
1966	244,063	258,794.
1967	564,977	266,226.

Properties and Uses

Lithium is the lightest metal in existence, it is also one of the lightest element having an atomic weight of only 6.94 and a density of 0.534. It has two isotopes Li^6 and Li^7, one of which, Li^6, would be used as raw material in the manufacture of tritium, a constituant of the hydrogen bomb. The melting point of lithium is 179°C and its boiling point is 1317°C; its high specific heat which is over one calorie per gramme make it a possible medium for heat exchange in thermonuclear reactors, the corrosive attack on containers may be overcome by improving the purity of the metal. Another property of the element which reflects on its use in ceramics is its small ionic radius, its principal effects are to lower the fusion temperature and the viscosity of the batch, and to extend the field of glass formation.

Lithium is also used extensively in the manufacture of greases which have the ability to resist water and perform satisfactorily over wide ranges of temperature. In air conditioning applications lithium compounds are used as absorbents and dehumidifiers. In metallurgy the metal is used as a scavenger because of its affinity for certain impurities like sulphur. Alloys of lithium with aluminium or magnesium have been developed in recent years. Lithium hydroxide acts as a catalytic agent, increasing the capacity and life of nickel-iron alkaline storage batteries.

Mineralogy and Geology

The most common lithium minerals are spodumene, amblygonite, lepidolite and petalite. These are pegmatitic minerals associated with

feldspars, mica and quartz in the pegmatites; tourmaline, garnet, apatite and beryl are common accessory minerals. In Quebec, spodumene has been the only lithium product, although occurrences of lepidotite and amblygonite are known. Lithium minerals also occur in certain clay deposits and the recovery of lithium from saline deposits is becoming an important economic factor in the lithium mining industry.

Prices, Trend and Reserves

In 1955, the Quebec Lithium Corporation entered into a contract with Lithium Corporation of America to sell 165 tons per day of spodumene concentrates grading not less than $4\frac{1}{2}$ per cent Li_2O. The price was $11.00 per 20 pound unit of Li_2O contained in the concentrate. This contract was terminated in 1959 at the time the United States Government ceased its purchases of lithium compounds. Prices for lithium minerals are no longer quoted and the data on United States production is withheld to avoid disclosing confidential information. In 1966, the total imports of lithium minerals into the United States were 9,260 tons valued at $259,474. an average of about $28. per ton. In 1955, Southern Rhodesia exported 55,924 tons of mineral concentrates valued at $1,100,195. an average of less than $20. per ton.

Prices for lithium salts have been declining in recent years, they are published regularly by the oil, paint and drug reporter. The carbonate sells for about 45¢ to 50¢ per pound and the hydroxide 55¢ to 60¢ per pound in carlots.

In these circumstances, it is not very encouraging to open a new mine or to operate a plant to produce lithium compounds. World reserves are enormous, the United States is importing less and less, and the prices are falling. Until the demand increases and research improves the mining and processing of the ores, there is little hope that lithium mining will resume in the remote regions of Canada.

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(3) Geology of Canadian Lithium Deposits, by R. Mulligan; G.S.C. Econ. Geol. Rept. no. 21, 1965.

(4) Kinojévis, Témiscamingue County, Que., by A.S. MacLaren; G.S.C. Paper 52-6, 1952.

(5) Quebec Dept. Nat. Resources, office files.

(6) Que. Dept. of Mines, P.R. no.

(7) 6th Commonwealth Mining and Metallurgical Congress. Geology of Canadian Industrial Mineral Deposits.

(8) Fiedmont Map Area by L.P. Tremblay; G.S.C. Mem. 253, 1950.

BAUNEVILLE Township, Temiscamingue county.

Range IX, lots 73-74

Ref.: 5 (T.C. Perry, 1961)

Four shallow holes were drilled in 1961 on the property of W.N. Millar. Pegmatite containing up to 25 per cent spodumene by visual estimate was encountered.

BELLECOMBE Township, Rouyn-Noranda county.

Range IV, lots 38-42

Ref.: 4; 5(J.E. Gilbert, 1955).

Spodumene with beryl and molybdenite occurs in pegmatites; a few crystals were seen on the property of Leon Doyon near the contact of sediments and a biotite-muscovite granite.

DELBREUIL Township, Temiscamingue county.

Near north shore of Lac Simard

Ref.: 3, p.52; 5 (J. Dugas, 1960).

This deposit was discovered around 1957 by Paul Viau. Three pegmatite dykes striking east-west contain spodumene in various amounts with apatite, fluorine, lepidotite, beryl and magnetite. One section of the southern dyke 200 feet long and 15 feet wide had 30 to 40 per cent spodumene in visual estimate.

Scattered pockets of spodumene also occur about 3 miles to the east on the R. Legault claims.

FIEDMONT Township, Abitibi-East county.

Range XIII, lots 3, 4.

Range IX, lots 1, 2.

Ref.: 3, p.51; 5 (M. Latulippe, 1957).

Vallée Lithium Mining Corporation Ltd. drilled 21 holes totaling 13,759 feet in 1956. Many pegmatite intersections were encountered but the spodumene content was low. The best intersection was 34 feet assaying 1.08 per cent Li_2O.

FIGUERY Township, Abitibi-East county.

Range II, 31-38, 10-13 S½

Ref.: 1, p.23; 2, p.11; 3, p.47; 5 (M. Latulippe, 1954); 6, no. 257; 7, p.161.

This deposit was discovered in 1947 by J. Cyr and was subsequently acquired by Lithium Corporation of America. Shallow drilling has outlined a dyke 600 feet long and 30 feet wide carrying an estimated 20 per cent of large green spodumene crystals; tourmaline, molybdenite and garnet are associated minerals.

About 4 miles to the west on lots 10-13 the company exposed three dykes near the north margin of the main granite batholith, one of these carries abundant spodumene across 10 feet.

Range II, lots 39-40

Ref.: 2, p.11; 3, p.48.

International Lithium Mining Corporation explored these lots around 1954. Flat lying pegmatite lenses were outlined by about 30 drill holes over an area of 300 by 400 feet on lot 39. One hole carried about 1.0 per cent lithia over 12 feet.

LACORNE Township, Abitibi-East county.

Range I, lots 7-11

Range II, lots 7, 8 S½, 9-13,

Ref.: 2, p.12; 3, p.51; 8, p.74.

Spodumene was discovered on lot 11, range II, by F.W. Schubb in 1944. In 1947, Great Lakes Carbon Corporation drilled one of the pegmatite dykes but found a lower grade of mineralization at depth. In 1956, Lithium Corporation of America carried out some development work and in 1961 optioned the property to Denison Mines Ltd. who did a limited amount of surface work.

Two pegmatite dykes trending northwest and about 500 feet apart have been traced by trenching over lengths of 900 and 400 feet respectively. Some sections showed 20 to 25 per cent spodumene at the surface but at depth, the grade was only 5 to 15 per cent.

Range III, lots 7, 8 S½

Ref.: 2, p.12; 3, p.50; 6 (M. Latulippe, 1956).

On the property of Amos Lithium Corporation three pegmatite dykes were explored by trenching and diamond drilling in 1955-56. The distribution of spodumene is erratic and does not represent more than 5 per cent of the mineralized zones. Beryl, molybdenite and columbite-tantalite are associated minerals.

Range V, lot 5.

Ref.: 3, p.49.

Ten shallow drill holes were put down on this lot in 1955 by Iso Uranium Mines Ltd. to test surface showings of spodumene bearing pegmatites. The results were mainly low grade.

Range VIII, lots 22-23

Ref.: 2, p.12; 3, p.48; 7, p.161.

Spodumene occurs in crystals up to 6 feet in length on the property of Valor Lithium Mines. A rich section 100 feet long and 45 feet wide occurs within a body of pegmatite and aplite. Beryl and lepidotite are associated minerals. The body does not seem to extend into depth.

Range IX, lots 50-61,

Range X, lots 52-53,

Ref.: 1, p.19; 2, p.10; 3, p.43-46; 7, p.162.

The property of Quebec Lithium Corporation is in the northeast corner of Lacorne township; it comprises ground formerly held by Lithium Exploration Co. Ltd. and Lacorne Lithium Mines.

Several pegmatite dykes straddle the contact between granodiorite and volcanics; one of these has been traced by drilling for a length of 8,000 feet, its width varies from 10 feet to 123 feet, the average grade is 1.2% lithia. There are at least 10 other dykes in the vicinity of the shaft within an interval of 1,500 feet.

Quartz, feldspar and spodumene are the main minerals in the dykes, beryl fluorite, columbite-tantalite, molybdenite, bismuthinite and garnet are rare accessory minerals. The company has estimated reserves of 15 million tons within a radius of 600 feet from the shaft and down to a depth of 850 feet.

This company was the only producer of spodumene concentrates in Quebec between 1955 and 1959, at this time a contract with Lithium Corporation of America was cancelled. Production was resumed from 1960 on completion of a lithium refinery capable of producing lithium carbonate, and later, lithium hydroxide monohydrate. All operations at the mine ceased in 1965 and stocks of lithium salts and spodumene concentrates were sold until 1967.

Range X, lots 38-41

Ref.: 3, p.46; 5 (M. Latulippe, 1954).

On this property, held by the Canadian Lithium Mining Corporation, numerous pegmatite dykes have been found. The favourable margin of the Lacorne batholith lies within the property which extends northward into Landrienne township. At the surface, the spodumene is sporadically distributed with enriched lenses 15 by 100 feet separated by lower grade sections. A considerable amount of diamond drilling was done on the property around 1956, no high concentrations were found at depth.

LAMOTTE Township, Abitibi-East county.

Range VII, lots 28-33

Ref.: 3, p.49; 5 (W. Ingham, 1956); 7, p.161.

On the property of Ascot Metals Corporation a pegmatite dyke has been traced by drilling over a length of 800 feet; it carries 0.8 per cent Li_2O in drill intersections. The dyke cuts through a biotite granodiorite plug near the south margin of the Lamotte granite batholith.

Range IX, lots 63-64,

Ref.: 3, p.51.

Gaitwin Explorations Limited reported some spodumene intersections from drilling.

Range X, lots 57-64,

Ref.: 3, p.47; 5 (M. Latulippe, 1957); 7, p.161.

The Lacorne Lihtium Mines Limited carried out an extensive programme of diamond drilling on these lots in 1955-56. Three areas of spodumene bearing dykes up to 1200 feet in length and 85 feet in width have been found. The spodumene is irregularly distributed and no mineable material was encountered in the drill core.

LANDRIENNE Township, Abitibi-East county.

Range I, lots 25-26

Ref.: 2, p.12; 3, p.46; 5 (M. Latulippe, 1954).

The property of Canadian Lithium Mining Corporation in Range X, Lacorne township discussed above (see page219) extends into Landrienne township. Four spodumene pegmatite dykes outcrop on lots 25-26 on the Lacorne-Landrienne township line one of which is 1250 feet long and 125 feet wide. The distribution of spodumene in the dyke is sporadic.

Ranges I, II, central part.

Ref.: 3, p.51.

The Keyboycon Mines owned a property adjoining the property of Canadian Lithium to the north. About 2500 feet of drilling was done in 1954-55 to explore the possible northern extension of a spodumene dyke outcroping on the property of Canadian Lithium; a number of spodumene pegmatite dykes were encountered but no commercial values.

Range I, lot 28 S½

Ref.: 5 (Wn. Ingham, 1956)

Martin McNeely Mines Ltd. drilled 4 holes totalling 3348 feet in 1955 close to a promising showing on the Canadian Lithium claims. Many narrow pegmatite dykes were encountered and one measuring 47 feet in width. The spodumene content was small.

MONTAINER Township, Rouyn-Noranda county.

2.6 miles N.E. of Montainer Lake.

Ref.: 3, p.52; 5 (M. Latulippe, 1955).

A pegmatite dyke was traced for a length of 2,000 feet varying in width from 25 to 50 feet on the property of Messrs Wells and Lacourcière. Merico Explorations Ltd. investigated the showing in 1956. The dyke is composed mainly of feldspar, quartz and muscovite; spodumene crystals are closely associated with the quartz rich spots and make up less than 5 per cent of the dyke. Beryl and tourmaline are associated minerals.

WAKEFIELD Township, Gatineau county.

Range VII, lot 25 S½

Ref.: 3, p.53.

This property known as the Leduc Mine was opened around 1884 for gem tourmaline which is not found in great enough quantity to be economical. A pegmatite dyke intrudes quartzite and sillimanite-garnet gneiss, it contains in addition to tourmaline, various feldspars, fluorite, small quantities of uraninite and of course mica which is the lepidotite variety. Flakes as large as one to two feet in diameter have been found in books one to two inches thick.

American Mines and Minerals Ltd. took an interest in the property in 1958 but little work was recorded.

1219 Township, Abitibi Territory

Nine miles N-W of Assinica Lake

Ref.: 3, p.54; 6, no. 550, p.15; 5 (Gilles Duquette, 1967)

Sirmac Mines Ltd. did considerable exploration work in 1959-60 on lithium pegmatites in the township 1219. In 1961, Consolidated Mining and Smelting optioned the ground and drilled 15 holes totalling 3415 feet. The main dyke was traced for a length of 900 feet and a width of 56 feet. At the surface the average Li_2O content was reported at 2.7 per cent but the dyke narrowsdown-dip and is no longer present at 400' in dept. Beryl tantalite-columbite, garnet, apatite and tourmaline are associated minerals. In 1968, the property was restaked by Yorbeau Mines Inc.

1222 Township, Abitibi Territory.

S.W. of Coulombe Lake

Ref.: 6 (Gilles Duquette, 1963)

In 1963 Muscocho Explorations Ltd. bought from Romeo Coulombe a number of claims in this township. Twenty-eight spodumene bearing pegmatites were found on the property varying in width from 25 to 100 feet and lengths of 100 to 800 feet or more; by visual estimation the rock would contain from 25 to 40 per cent spodumene. In 1963, 32 channel samples were taken over these dykes and the average Li_2O content was 1.16 per cent.

MAGNESIUM MINERALS

Mineralogy

Magnesium is a very abundant element in the earth's crust accounting for more than 2 per cent of all known terrestrial matter. It is found in igneous rocks, especially the more basic ones and in sediments particularly in limestones. Sea water contains 0.14 per cent of the element according to Clarke*, and this source is becoming an important source of magnesium for industry.

The minerals most commonly sought as a source of magnesium is magnesite ($MgCO_3$) which contains 47.7 per cent MgO when pure. The hydroxide brucite ($Mg(OH)_2$) theoretically contains 69.1 per cent MgO. In many limestone deposits, magnesium has replaced calcium in the crystal structure of the calcite but this substitution cannot go beyond a Ca:Mg ratio of approximately 1:1, because of the considerable size difference of the ions; the mineral dolomite is the result of such a replacement. Other magnesium minerals like forsterite (Mg_2SiO_4) and spinels ($MgAl_2O_4$ and many other varieties) are produced to be utilized in the manufacture of refractories.

Uses

The magnesium carbonates especially the dolomites are used abundantly in agriculture to replenish the magnesium absorbed by crops or leached from soils and to correct for acidity. In Quebec, The Department of Agriculture, gives a higher neutralizing value to the limestones containing magnesium than to the high calcium types because the soils show higher deficience in magnesium.

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* F.W. Clarke, The Data of Geochemistry, U.S.G.S. Bulletin 770, p.36.

As a fluxing stone in blast furnaces dolomite is often preferred to high calcium limestone because it helps to control the fluidity of the slag keeping it fluid over a wider range of temperatures.

In the milk of lime method of making sulphite pulp, dolomite is preferred to the high calcium stone.

The ceramic industry is the principal user of magnesian minerals and compounds. Some glass manufacturers use dolomite in the glass batch instead of high calcium limestone; as much as 30% of the mixture is either limestone or dolomite. Because of the high melting point of the magnesian oxyde (MgO), the mineral periclase or any other magnesian mineral capable of yielding a high percentage of oxyde has, for many years, been a favorite raw material in the manufacture of refractories. Besides their resistance to high temperatures, magnesite refractories are able to withstand heavy loads and they are not affected by basic slags; they are thus used extensively in the steel and copper industries.

Forsterite refractories contain from 35 to 55 per cent MgO. The mineral forsterite is formed during the firing of dunites or serpentines to which has been added a calculated amount of magnesium oxide. Unlike magnesite, ultrabasic intrusive rocks are very abundant in Quebec, huge piles of crushed and ground material lie near the asbestos mills in the Eastern Township; no attempt has ever been made to test their suitability as raw material for refractories.

The mineral talc which is also found abundantly in Quebec, especially in the Eastern Township is another magnesian mineral used in the refractory industry as such or to make forsterite refractories. It is not decomposed by acids, it can be sawm into various shapes and does not shrink during firing; its refractoriness is of the order of 1350°C.

Magnesium compounds such as the sulphate and chloride are used in the chemical industry, in agriculture, in medicine and in the production of magnesium metal. These salts are obtained directly from well waters or by chemical reaction with sulfuric acid or chlorine.

LIST OF OCCURRENCES

A complete list of occurrences of magnesian minerals would be very long indeed especially if the magnesium silicates are included. As mentioned above, these silicates have not been sought in Quebec as a possible source of magnesium but mainly because of their association with asbestos. At various times, some research was done on the material from the asbestos mine-dumps in view of finding an utilization for these huge piles of crushed and ground material rich in magnesium, their treatment with sulfuric acid can yield magnesium sulphate and an active form of silica with high absorptive properties. Leaching with hydrachloric acid could provide magnesium chloride. It may be possible to treat this material to prepare a product suitable for the manufacture of forsterite refractories.

The following list of occurrences does not include the magnesian silicates found in abundance in all basic and ultrabasic rocks. The list includes the magnesite dolomite and brucite deposits containing a high enough percentage of magnesium to make them attractive in agriculture, in metallurgy, in the pulp and paper or in the refractory industries. Theoretically, dolomite contains 21.7% MgO or 45.7% $MgCO_3$ by weight. A.S.T.M. designation C-468 for refractory granular dolomite specifies a maximum content of 16% MgO or 34% $MgCO_3$ allowing 1.75% SiO_2, 1.50% Al_2O_3 + TiO_2 and 0.08% sulphur as impurities. The list includes only the locations showing an analysis higher than 14% MgO or 30% $MgCO_3$ regardless of the content of silica or other impurities.

PRINCIPAL REFERENCES

(1) Dept. of Mines and Technical Surveys, Mines Branch no.

(2) Mining Operations in the Province of Quebec

(3) Office files

(4) Report of the Commissioner of Crown Lands

(5) Department of Mines Quebec, Preliminary Report no.

(6) G.S.C. Report of Progress

(7) Department of Mines Quebec, Geological Report no.

(8) Geological Survey of Canada, Memoir no.

(9) Bureau of Mines, Annual Report

(10) Mines and Geology Branch, Ottawa Memorandum series

ARGENTEUIL Seigniory, Argenteuil county.

South of Lachute

Ref.: 1, 755, p.45; 2, 1916, p.65

Two quarries were operated immediately south of Lachute in Beekmantown formations. Sample 1 is representative of the quarry nearest the town and samples 2 and 3 represent the stone in the quarry located 1/2 mile to the south.

Sample	SiO_2	Fe_2O_3	Al_2O_3	$Ca_3(PO_4)_2$	$CaCO_3$	$MgCO_3$	S
1	9.20	1.36	3.12	0.09	48.62	35.99	0.14
2	15.84	2.34	3.24	0.07	45.42	33.15	0.72
3	18.80	0.55	1.45	----	45.44	33.15	----

AYLWIN Township, Gatineau county.

Range V, lots 8 and 9

Ref.: 1, 755, p.70.

Grenville limestone outcrops at several places on lots 14 to 18. Samples 1 and 2 were collected on lots 8 and 9. At other places on these lots, the limestone is calcitic.

Sample	SiO_2	Fe_2O_3	Al_2O_3	$Ca_3(PO_4)_2$	$CaCO_3$	$MgCO_3$	S
1	3.44	0.31	0.29	0.13	74.72	21.94	Nil
2	5.34	0.41	0.34	0.02	53.64	42.26	"

BEAUHARNOIS Seigniory, Beauharnois county.

Two miles east of Beauharnois

Ref.: 1, 755, p.192

In a pit two miles east of Beauharnois, a sample was taken from a brown dolomitic limestone of Beekmantown age. Sample 1 is representative of 3½ feet of this stone.

Sample	SiO_2	Fe_2O_3	Al_2O_3	$Ca_3(PO_4)_2$	$CaCO_3$	$MgCO_3$	S
1	2.96	0.50	1.04	0.04	55.00	40.32	0.16

One mile S.E. of Landreville

Ref.: 1, p.755, p.192

A high magnesium analysis was obtained from a quarry of Beekmantown dolomite at this location. Sample 1 is representative of 2 feet of fine grained blue-grey stone.

Sample	SiO_2	Fe_2O_3	Al_2O_3	$Ca_3(PO_4)_2$	$CaCO_3$	$MgCO_3$	S
1	6.80	0.95	1.30	0.11	51.70	38.56	0.10

BEAUHARNOIS Seigniory, Chateauguay county.

Two miles S.W. of Ste. Clothilde

Ref.: 1, 755, p.197.

The old Marcil Quarry situated here was operated in Beekmantown dolomite; an old opening near the crushing plant gave a higher magnesium analysis than in the working quarry. Sample 1 was taken from the older quarry where lime was made at one time.

Sample	SiO_2	Fe_2O_3	Al_2O_3	$Ca_3(PO_4)_2$	$CaCO_3$	$MgCO_3$	S
1	18.94	1.38	1.26	0.11	47.20	30.97	0.25

BOLTON Township, Brome county.

Range IX, lots 17 and 24.

Ref.: Geol. of Canada 1863, pp.457-458.

These deposits contain highly siliceous magnesite rocks. Samples 1 and 2 are from lot 17.

Sample	$MgCO_3$	$FeCO_3$	SiO_2 and insolubles
1	59.13	8.32	32.20
2	59.72	10.31	29.90

BROME Township, Brome county.

Range X, lot 9,

Range XI, lot 16,

Ref.: 1, 755, p.194; 2, 1916, p.65.

A dolomite band 175 feet maximum width contains masses of schist and veins of quartz (sample 1). A similar occurrence lies about 3 miles to the north on the east side of Brome Lake (samples 2 and 3).

Sample	SiO_2	Fe_2O_3	Al_2O_3	$Ca_3(PO_4)_2$	$CaCO_3$	$MgCO_3$	S
1	6.42	5.11	0.76	0.07	50.21	36.41	tr.
2	5.78	2.95	0.81	0.07	52.10	38.58	"
3	9.88	3.86	0.70	----	49.10	36.07	----

CAMPBELL Township, Labelle county.

Range J, lots 7, 8, 10

Ref.: 3, (P.E. Bourret 1943, 1962).

The dolomite on these lots first caught the attention of H. Jodoin in 1943 when he observed the stone in a railroad embankment near Val Barrette. Lots 7 and 8 were staked in 1961 by Adelard Labelle who transferred his rights to Artoma Investment. The deposit was worked by Laurentian Dolomite Ltd. from 1963 to 1965, by Airmat Corporation from 1966 to 1968 and by Cimex Inc. from 1968 until now. The production of 400 to 500 tons per day is used mainly in agriculture or in the making of artificial stone.

Lot 10 S.E.½ and N.W. ½ were staked in 1961 by Anne-Marie Charbonneau and Paul Lussier respectively; Cement Distributors took over the properties the same year and was later succeeded by Quebec Dolomite Co. In 1968, Tremblay Marble & Granite Quarries started operations and shipped some 5,000 tons to a crushing plant in Ville St. Leonard.

The physical character of the stone has been, up to now, its main point of attraction. Some analyses have shown that the stone is quite rich in magnesium at places. In 1961, five shallow holes were drilled on lot &J and representative samples of the core were analysed for calcium and magnesium carbonates and for silica; the results showed the $CaCO_3$ content varying from 54 to 56 per cent, $MgCO_3$ from 24 to 32 per cent and SiO_2 from 5 to 11 per cent.

CHATHAM Township, Argenteuil county.

Concession I, lots 221-224

Ref.: 3 (P.E. Bourret, 1959).

Dolomitic limestone outcrops in a Beekmantown formation on these lots. A chip sample taken from an outcrop near the house of Mr. Manny Wilson gave 46 per cent $CaCO_3$, 30 per cent $MgCO_3$ and 24 per cent impurities.

CHESTER Township, Arthabaska county.

Range II, lot 12

Ref.: 5, 164, p.7; 4, 1895, p.49.

Bands of dolomite containing scattered occurrences of hematite have been described by J. Obalski as early as 1895. One of these bands measures more than one half mile, another is traced for more than 800 feet by a line of outcrops. A partial analysis of the dolomite is given by H.W. McGerrigle from this lot.

Sample	SiO_2	MgO	Fe	P	S	H_2O
1	3.93	17.52	2.09	0.08	nil	0.08

CLARENDON Township, Pontiac county.

Range II, lots 22 and 31

Ref.: 1, 755, p.135.

On lot 22 near the railway, a coarse grained dolomite is exposed in contact with gneiss. Sample 1, taken from the outcrop, gives an analysis very close to a theoretical dolomite. On lot 31 a quarry was operated at one time by the White Grit Company, the rock is snowy white with veins of pinkish brown dolomite. Both the white dolomite (sample 2) and the brownish vein material (sample 3) show a high magnesium content quite free of impurities.

Sample	SiO_2	Fe_2O_3	Al_2O_3	$Ca_3(PO_4)_2$	$CaCO_3$	$MgCO_3$	S
1	0.72	0.18	0.16	tr.	55.70	44.23	tr.
2	0.32	0.12	0.12	0.02	55.88	43.92	nil
3	0.50	0.94	0.14	0.09	55.29	43.71	0.02

DENOUE Township, Gaspe North county.

5 miles from nouth of Madeleine River

Ref.: 6, 1857, p.203; 6, 1863, p.614.

A sample was taken from a dolomitic limestone of Ordovician age which gave the following analysis.

Sample	SiO_2	$Al_2O_3 + Fe_2O_3$	$MgCO_3$	$CaCO_3$
1	20.30	4.10	32.12	43.17

EARDLY Township, Gatineau county.

Range XIII, lot 14 N.E.¼

Ref.: 3 (1948, 1960).

This claim was staked in 1948 on behalf of the Aluminium Company of Canada. Brucitic limestone occurs along a ridge some 500 feet long trending northeastward. Five holes were drilled in 1960 to test the continuity of the brucite occurrence at depth as well as laterally; serpentine, limestone, diopside rock and syenite were mainly encountered. A composite of 3 bulk samples taken from surface exposures gave the following analysis.

Sample	SiO_2	CaO	MgO	R_2O_3	L.O.I.
1	3.2	34.3	23.1	0.7	38.7

GODMANCHESTER Township, Huntington county.

Near Huntington

Ref.: 1, 755, p.201; 2, p.65, 1916; 3 (P.E. Bourret, 1944).

Several quarries were opened within a five mile radius of Huntington. Flat lying strata of Beekmantown dolomite containing a high percentage of magnesium were worked especially for road metal or for making lime. Sample 1 was taken from a quarry 3½ miles west of the town, it represents 10 feet of strata; sample 2 is from a quarry 2 miles west of the town and represents the top 11 feet of strata; sample 3, from the same quarry represents the bottom 7 feet; sample 4, is from a quarry 5½ miles northeast of the town and represents four feet of strata; sample 5 is from a quarry in range III, lot 14 worked around 1900 for making lime; sample 6 is from a quarry on lot 416 and sample 7 is from a quarry formerly worked by Ross Church and Co.

Sample	SiO_2 insoluble	Fe_2O_3	Al_2O_3	$Ca_3(PO_4)_2$	$CaCO_3$	$MgCO_3$	S
1	14.26	1.51	1.55	0.04	45.95	35.09	0.38
2	6.75	1.42	0.95	0.09	56.03	34.09	0.28
3	6.76	1.33	0.93	0.15	52.07	37.47	0.39
4	6.46	0.95	1.21	0.07	52.82	37.17	0.15
5	--	--	--	--	53.50	42.20	--
6	3.40	0.86	0.60	--	52.53	41.80	--
7	15.30	0.86	0.38	--	45.53	36.62	--

GRAND CALUMET Township, Pontiac county.

Range I Réserve, lots 6, 7, 8.

Ref.: 1, Mem. Series no. 75, p.23; 5, 139, p.12; 7, 18, pp.25-28.

Thin bands of brucitic limestone associated with serpentine occur near the southeastern tip of Calumet Island in the vicinity of the dam. Diamond drilling on lot 6 has encountered other narrow bands but no great tonnage.

GRENVILLE Township, Argenteuil county.

Range VIII north, lots 11 and 12.

Ref: 8, no.98, p.59.

On these lots, dolomitic magnesite is exposed in a trench and occurs as large boulders. A sample from one of the boulders analyzed 66.38 per cent $MgCO_3$ and 23.96 per cent $CaCO_3$.

Range VIII south, lots 11 and 12.

Ref.: 8, no.98, p.60.

Dolomitic magnesite exposed in a pit on lot 11. An enormous boulder of the material found on lot 12 from which 52 tons of magnesite were shipped.

Range IX, lot 15.

Ref.: 1, 755, pp.39-44; 8, no.98, pp.52-59; 9, 1936 pt. C pp.63-87.

These lots contain the only magnesite mine in Eastern North America. Magnesite was discovered on lot 15 by the Rev. W.B. Bosbart in 1900 and since then the area has known a continuous activity. In the history of development of this mining camp, a few dates are memorable:

1900 : Discovery of magnesite on lot 15 by the Rev. W.B. Bosbart.

1907 : J.T. Watters organises Canadian Magnesite Company purchasing lot 18, range XI and later lot 15, range IX from Mr. D. McPhee, the original owner of the land.

1914 : North American Magnesite Company takes over the property of Canadian Magnesite Company.

1915 : Scottish Canadian Magnesite Company is organized by Mr. S. Melkman to mine on lots 15 range X and XI.

1916 : A narrow gauge railroad is built to connect the mines with the Canadian Pacific railway.

1933 : North American Refractories and Scottish Canadian Magnesite are fused into Canadian Refractories Limited.

1936 : The company decides to go underground.

1942 : Acquires property of International Magnesite Company in Harrington township.

1945 : Harbison Walker Refractories Limited acquires Canadian Refractories Limited.

1949 : A sink and float process is installed in the mill at Kilmar.

1953 : Shaft is sunk on the north ore zone and an underground drift is driven on the 850 foot-level to join with the no. 1 shaft at southern ore zone. This drift, 7300 feet long, is completed in 1958. In 1953, the plant at Marelan Quebec is built, it produces magnesite and chrome brick, ramming mixes castables, cements and many other forms of refractories, using local or imported refractory materials.

1959 : Research Laboratories opened at Marelan, Quebec.

1966 : A tunnel kiln 400 feet long installed at the Marelan plant.

Over a distance of about 3 and a half miles in a general northsouth direction, limestones and dolomites come in contact with quartzites and sillimanite-garnet gneisses on the west and quartz monzonites of the Morin series on the east. Two important ore zones occur in this area which have been designated the south and north ore zones, respectively. Irregular bodies of dolomitic magnesite are to be found within these ore zones usually mixed with serpentine and dolomite. These bodies have been developed by underground workings reaching depths of 1028 and 1500 feet for the south and north zones respectively.

In recent years the production has been at a rate of 350 to 550 tons of dolomitic magnesite per day.

Range X, lots 7, 14 and 15.

Ref.: 8, no. 98, pp. 51 and 61; 9, 1936-C, p.79.

Many boulders of magnesite were found on lot 7 indicating a possible occurrence of magnesite in place further north. An occurrence of magnesite was found on lot 14 near a sillimanite-garnet gneiss associated with diopside rock and serpentine. On lot 15, there is an extension of the northern ore zone of Canadian Refractories. Another deposit occurs near the northern boundary of the lot.

Range XI, lots 15 and 18.
Ref.: 8, no. 98, pp. 38-51.

On lot 15 there are three exposures of magnesitic dolomite and serpentine along a northeast line some 2000 feet long parallel to a sharp ridge composed of diopside rock and syenite on the east, the rare outcrops to the west are quartzites. This was part of the property of Scottish Canadian Magnesite Company before amalgamation in 1933.

The Shaw mine also operated before 1933 by the Scottish Canadian Magnesite Company is located on lot 18. The ore body here is flanked on the east by intrusives of the Morin series and on the west by crystalline limestones.

GRENVILLE Augmentation, Argenteuil county.
Range XI, lot 9
Ref.: 8, no. 98, p.60.

On the east shore of Papineau lake, M.E. Wilson reports the occurrence of serpentinized dolomitic magnesite several hundred feet long and 100 to 200 feet wide. An average sample collected by Wilson gave the following analysis.

Sample	$CaCO_3$	$MgCO_3$	Insoluble
1	36.60	63.66	0.10

GUIGUES Township, Témiscamingue county.

Mann Island

Ref.: 1, 755, p.159.

Flat lying silurian limestones and dolomites occur on Mann Island in lake Timiskaming. Samples 1 and 2 were taken from a quarry once operated for making lime; sample 1 represents 3 feet of strata below 32 feet of limestone and sample 2 represents the next 10 feet of strata below. Sample 3 was taken at lake level a short distance north of the quarry and represents 8 feet of strata.

Sample	SiO_2	Fe_2O_3	Al_2O_3	$Ca_3(PO_4)_2$	$CaCO_3$	$MgCO_3$	S
1	11.70	1.13	1.59	0.09	50.52	34.94	tr.
2	3.30	1.02	0.42	0.02	56.41	38.48	tr.
3	2.38	1.10	0.48	0.28	54.10	41.98	tr.

HALIFAX Township, Mégantic county.

Range II, lot 13

Ref.: 5, 164, p.7; 4, 1895, p.49.

Dolomite occurs in association with hematite near Ste. Helène de Chester. Sample 1 was collected north of the range-road II-III and partially analysed.

Sample	SiO_2	Fe	P	H_2O	MgO
1	11.00	2.70	0.18	0.03	16.32

HEMMINGFORD Township, Huntingdon county.

One mile south of Barrington

Ref.: 1, 755, p.202.

A fairly pure Beekmantown dolomite was quarried on a small scale at this location. Sample 1 was taken from 3 feet of beds exposed in the quarry.

Sample	SiO_2	Al_2O_3	$Ca_3(PO_4)_2$	$CaCO_3$	$MgCO_3$	S

HARRINGTON Township, Argenteuil county.

Range I, lot 13.

Ref.: 1, 755, p.43; 8, no. 98, p.37; 9, 1936-C.

This deposit was discovered in 1916 by A. Lannigan and J. Milray and was taken over in 1918 by the International Magnesite Company who operated the mine and a kiln until 1942 when the property was acquired by Canadian Refractories Limited. The deposit is known as the Dolbie Mine which has been worked in five pits spread over a 1200 foot-length. The ore occurs in bodies of irregular size and shape.

HULL Township, Gatineau county.

Range V, lot 12.

Ref.: 1, 755, p.71.

About two miles west of Hull, many outcrops of dolomite occur within the Grenville rocks. Sample 1 was taken from chosen rocks.

Sample	SiO_2	Fe_2O_3	Al_2O_3	$CaCO_3$	$MgCO_3$
1	2.73	0.31	0.16	54.85	43.46

Range XIV, lots 23, 24.

Ref.: 5, 1939, p.12; 10, no. 75, p.30.

Brucite deposit 700 feet long and 300 feet wide containing a rich band 50 to 100 feet wide and 400 feet long of large brucite granules. Sample 1 was taken from this band.

Sample	Insoluble	Fe_2O_3	Al_2O_3	CaO	MgO	CO_2	Water + 105°C
1	1.02	0.23	0.23	34.18	23.97	31.04	9.74

500 feet south of this deposit another brucite showing with smaller granules occurs associated with calcite, pyroxenite and diopside; a certain banding of brucitic and non-brucitic material is observed.

Range XV, lots 22, 23.

Ref.: 5, 139, pp. 10-11; 10, no.75, pp. 28-30.

A crescent shaped deposit of brucitic limestone extends northeastward for about 1,000 feet then curves southeastward for another 1000 feet near the center of lot 22, close to lot 23. The best part of the deposit is near the top of the crescent on the west side where the brucite granules are larger and the impurities are fewer. The width of the brucitic limestone is about 150 feet in this zone. Sample 1 was taken from this location.

Near the south end of lot 22 another smaller deposit occurs on the west flank of a granite ridge. It measures about 300 feet long in a north-south direction, its width varies from 50 feet to 200 feet. Brucite granules of 2 to 2.5mm. are common in this deposit. Sample 2 is representative of this deposit except for a serpentinous zone near the south end.

The original discovery of brucite in the area was on the property of Stephan Cross near the north end of lot 23; it lies east of a granite hill and occupies a circular area some 500 feet in diameter. This deposit was worked around 1939 by Canadian Refractories Limited and from 1959 to 1968 by Aluminum Co. of Canada. Samples 3, 4, and 5 are from outcrops northeast of the quarry, from the east face of the quarry and from an average collection from shipments respectively.

Sample	Insoluble	Fe_2O_3	Al_2O_3	CaO	MgO	CO_2	Water + 105°C
1	0.85	0.24	0.25	34.48	23.31	31.75	9.61
2	0.80	0.23	0.13	35.66	23.05	31.34	9.36
3	0.64	0.51	0.37	34.59	24.70	28.82	10.65
4	0.51	0.42	0.20	35.31	24.40	30.21	9.15
5	0.58	0.21	0.20	35.74	23.49	30.10	10.15

Brucite deposits have been found at several other places on lot 23 west of the granite hill and the deposit described above. One of these is about 1,000 feet west of the quarry, it measures 200 feet in length and about 100 feet in width. Other smaller showings have not been developed in the west side of the granite hill.

Range XVI, lot 26.

Ref.: 10, no 75, pp.39-41.

This is the Maxwell deposit worked very actively between 1941 and 1961 by the Aluminium Co. of Canada for the production of magnesia. During the period from 1946 to 1959, part of the magnesia was shipped to Arvida where the company had a plant to producing magnesium metal.

Brucitic limestone occurs in a northsouth zone some 900 feet long and widths up to 400 feet. Serpentine is often intimately mixed with the brucite. Sample 1 was collected by M.F. Goudge in the southern part of the deposit.

Sample	Insoluble	Fe_2O_3	Al_2O_3	CaO	MgO	CO_2	Water + 105°C
1	2.26	0.33	0.47	35.20	23.00	28.90	9.82

ISLE D'ORLEANS Seigniory, Montmorency county.

Ref.: 6, 1863, p.613.

In the Geology of Canada 1863, an analysis is given of a dolomitic rock without specifying the exact locality on Isle d'Orleans from which the sample was taken (sample 1 below).

Sample	Insoluble	$FeCO_3$	$CaCO_3$	$MgCO_3$
1	13.80	10.31	45.06	31.81

ISLE DE MINGAN Seigniory, Saguenay county.

N.E. shore of Grande Isle

Ref.: 3, (G.W. Waddington, 1948).

Sample 1 below was taken in ordovician strata over a thickness of 20 feet. This dolomite horizon is exceptional in this area since most of the limestones are high in calcium.

Sample	SiO_2	Fe_2O_3	Al_2O_3	$Ca_3(PO_4)_2$	$CaCO_3$	$MgCO_3$	S
1	2.63	0.69	0.20	0.03	53.42	43.21	0.07

LABELLE Township, Labelle county.

Range I, lots 51, 52

Ref.: 3 (M. Latulippe).

Grenville limestones and dolomites are overlain by syenites and granites on these lots known as the Barrette-Coupal prospect. A dolomite band 200 feet in thickness strikes northwest and dips 30 to 40° S.W. Channel samples were taken from the walls of an adit dug into the dolomite. The analysis below is a composite of 6 of these channel samples.

Analysis	CaO	MgO
1	25.20	22.31

The mineral association consisting of serpentine, diopside, phlogopite is typical of limestone areas showing intrusive relations responsible for the formation of many magnesite and dolomite deposits.

LAC DES DEUX MONTAGNES Seigniory, Deux Montagnes county.

Less than one mile north of Fresnier

Ref.: 1, 755, p.163.

Flat lying Beekmantown strata are exposed in a quarry at this location. Sample 1 represents 8 feet of strata.

Sample	SiO_2	Fe_2O_3	Al_2O_3	$Ca_3(PO_4)_2$	$CaCO_3$	$MgCO_3$	S
1	11.90	1.03	1.55	0.09	47.53	35.09	0.19

LANORAIE Seigniory, Joliette county.

Three miles east of St. Elizabeth

Ref.: 1, 755, p.77; 2, 1916, p.65.

A low ridge of impure magnesian limestone occurs near St. Elizabeth; the rock is probably of Beekmantown age. Samples 1 and 2 are from this ridge, no. 1 representing the top 4 feet and no. 2, lenses of coarse-grained material in the same ridge. Sample 3 was collected around 1914 by Mr. Howells Fréchette near St. Elizabeth.

Sample	SiO_2	Fe_2O_3	Al_2O_3	$Ca_3(PO_4)_2$	$CaCO_3$	$MgCO_3$	S
1	7.94	1.67	0.81	n.d.	56.18	33.76	n.d.
2	5.00	0.15	1.13	n.d.	62.61	30.55	n.d.
3	7.36	1.43	0.65	n.d.	51.78	36.91	n.d.

LA TRAPPE Township, Roberval county.

Range III, lots 12, 13.

Ref.: 3 (P.E. Bourret, 1953).

This deposit was discovered around 1953 by André Chabot of St. Stanislas. It lies on the slope of a hill constituted by syenite and

anorthosite. A band some 700 feet long contains many boulders of brucitic limestone, some of these blocks are quite large measuring up to 6 feet in diameter. The brucite granules vary in size from very small up to 3 mm. in diameter. Two chip samples collected from a number of the blocks showed about 50% brucite with a little dolomite and serpentine.

LAUZON Seigniory, Levis county.

Near the church of St. Joseph de Levis

Ref.: 6, 1863, p.613.

A sample taken near the church gave the following analysis.

Sample	Insolubles	$FeCO_3$	$MgCO_3$	$CaCO_3$
1	8.80	5.80	31.90	53.04

LITCHFIELD Township, Pontiac county.

Range I, lots 12-15

Ref.: 5, 139, p.12,13; 10, no.75, p.20-22.

Brucitic limestones have been traced by outcropings over a north-south distance of more than one mile in the vicinity of Bryson village. A short distance south of the town, two quarries were opened in the late 19th century to produce building stone and lime. Brucite is found in bands up to 45 feet wide between the two quarries and within the eastern quarry; some ore was extracted from this location in 1939 for experimental purposes by Canadian Refractories Ltd.

The brucite granules are generally coarse-grained attaining 13 mm. in diameter. Two samples were collected by Goudge in the quarry, no. 1 represents the entire 30 foot-band in the quarry and no. 2 the central 15 foot-band.

Sample	SiO_2	Fe_2O_3	Al_2O_3	CaO	MgO	CO_2	Water + 105°C
1	2.37	0.17	0.19	35.52	21.34	32.94	7.39
2	1.76	0.18	0.09	33.98	22.99	32.40	8.50

Range I, lots 30, 31.

Ref.: 1, 755, p.135; 2, 1916, p.65; 3 (O.D. Maurice, 1950).

Near Portage du Fort, white dolomite occurrences have been known since the time of Logan's Report on the Geology of Canada in 1863. Quarries were opened by Pontiac Marble and Lime Co. in the early part of the century, around 1920 White Grit Company took over the operations until 1944 and from then until 1958, the operations were conducted by Canadian Dolomite Company.

The stone is snowy white except for a few yellow and brown stains near the surface and near joints and fractures. Sample 1 is representative of the white dolomite in the quarries, sample 2 represents brownish veins in the same quarries, sample 3 was collected by Howells Fréchette in 1914 in the quarry then operated by Pontiac Marble and Lime Company.

Sample	SiO_2	Fe_2O_3	Al_2O_3	$Ca_3(PO_4)_2$	$CaCO_3$	$MgCO_3$	S
1	0.32	0.12	0.12	0.02	55.88	43.92	nil
2	0.50	0.94	0.14	0.09	55.29	43.71	0.02
3	0.15	0.22	0.06	--	57.14	43.12	--

LOCHABER Gore Township, Papineau county.

Range I, lot A.

Ref.: 1, 755, p.131.

Flat beds of Beekmantown dolomite have been quarried at Thurso and eastward. Sample 1 was taken in a quarry four miles east of the town, it represents 10 feet of strata.

Sample	SiO_2	Fe_2O_3	Al_2O_3	$Ca_3(PO_4)_2$	$CaCO_3$	$MgCO_3$	S
1	11.32	1.53	2.03	0.09	48.77	36.83	0.40

LONGUEUIL Seigniory, Soulanges county.

Ref.: 1, 755, p.157.

The Beekmantown dolomite occuring in Soulanges county is usually high in silica and magnesia. Sample 1 below was taken near Coteau Landing and represents 6 feet of strata. Sample 2 is from an old quarry north of the Soulanges Canal, formerly worked by Quinlan and Robertson Ltd., it represents the top 7 feet of strata. Sample 3 is from the same quarry and represents 2 feet of thinly bedded stone beneath the 7 feet represented by sample 2.

Sample	SiO_2	Fe_2O_3	Al_2O_3	$Ca_3(PO_4)_2$	$CaCO_3$	$MgCO_3$	S
1	9.56	1.88	0.46	0.11	50.62	37.61	0.19
2	4.68	1.08	0.16	0.02	53.45	40.40	0.05
3	10.10	1.51	2.39	0.07	47.13	36.70	0.45

MAGOG Township, Stanstead county.

Range XIV, lot 12

Ref.: 1, 346, p.51; 2, 1916, p.65.

A sample of impure dolomite was collected in an area which is generally considered a high calcium limestone area.

Sample	Insoluble	Fe_2O_3	Al_2O_3	$CaCO_3$	$MgCO_3$
1	10.14	0.79	4.15	50.09	35.70

MARCHAND Township, Labelle county.

Range III, lot 40

Ref.: 1, 755, p.79; 3 (P.E. Bourret, 1937, 1940).

The quarry of Canada Marble and Lime Co. was opened around 1928 in Grenville limestones. Much of the stone is pure bluish white but impurities such as serpentine, diopside, scapolite, graphite and mica are common giving the rock greenish and yellowish tints. Samples 1 and 2 represent the average grade of rock in the quarry and of the pulverized material produced.

Sample	SiO_2	Fe_2O_3	Al_2O_3	$Ca_3(PO_4)_2$	CaO	MgO	S
1	7.94	0.35	0.40	0.01	31.33	20.18	tr.
2	5.96	0.12	0.30	0.02	31.46	20.03	nil

MASHAM Township, Gatineau county.

Range I, lot 6.

Ref.: 5, 139, p.10; 10, no.75, p.36.

International Magnesite Company Ltd. beld an option on this property around 1939 and did considerable work to encover the brucite deposit which occurs on the northwest side of a hill and is triangular in shape. The brucite granules are 1 to 4 mm. in diameter and are imbedded in a calcite matrix. The two analyses below were made on samples representative of the entire deposit (S. 1) or excluding serpentinous bands (S. 2).

Sample	Insoluble	Fe_2O_3	Al_2O_3	CaO	MgO	CO_2	Water + 105°C
1	1.71	0.61	0.31	38.08	18.91	32.05	8.05
2	1.16	0.82	0.39	38.40	18.99	31.23	8.87

Range III, lot 7

Ref.: 5, p.9.

Disseminated brucite occurs in outcrops of Grenville limestone near the Wakefield road.

MILLE ISLE Seigniory, Terrebonne county.

Ste. Thérèse de Blainville

Ref.: 1, 755, p.160; 2, 1916, p.65.

A quarry was opened for road metal in impure Beekmantown formations, northwest of the village of Ste. Thérèse. The 15 feet of exposed stone in the quarry is represented by sample 1 below. Another sample was collected in 1914 in this quarry which was then operated by J.F. Paré (S. 2). The Beekmantown formations lying south

of the village were also sampled and show high magnesium content. Sample 3 represents 3½ feet of strata at the top and sample 4 the next 8 feet below.

Sample	SiO_2	Fe_2O_3	Al_2O_3	$Ca_3(PO_4)_2$	$CaCO_3$	$MgCO_3$	S
1	13.10	1.82	1.78	0.09	48.88	33.40	0.24
2	13.84	1.21	0.21	—	49.91	34.36	--
3	5.46	1.38	1.54	0.04	61.66	29.28	0.22
4	4.90	1.43	1.33	0.04	60.70	31.77	0.29

POLETTE Township, Laviolette county.

Range II, lot 18.

Ref.: 3 (P.E. Bourret, 1944).

Crystalline dolomite occurs on this lot over a width of 400 feet and a length of more than 900 feet striking about N. 44°E. A sample from this deposit analysed as follows.

Sample	CaO	MgO
1	31.0	21.4

PONSOMBY Township, Papineau county.

Range VII, lot 41

Ref.: 1, 755, p.132; 3 (A.O. Dufresne 1922, A. Deland 1963).

The presence of white crystalline limestone and dolomite in this area has been known for 50 years. In 1963, Gerald Drouin uncovered an area of about 150 feet in diameter and drilled 6 holes to shallow depths.

The first four holes aggregating to 94 feet in total length were analysed individually, sample 1 below represents the calculated average values found in these holes. Sample 2 represents a 50 foot-width of stone comprising bands of dolomite and calcium limestone. In 1966, the property was taken over by Airmat Corporation Limited.

Sample	SiO_2	Fe_2O_3	Al_2O_3	P_2O_5	CaO	MgO	CO_2, H_2O, S		
1	16.66	1.48	0.95	--	26.94	23.99	29.23		
2	13.88	0.99	0.06	0.17	28.38	23.91	28.96	4.16	nil

Magnesium silicates may account for a large part of the magnesia content.

ST. ARMAND Seigniory, Missisquoi county.

Near Philipsburg

Ref.: 1, 755, p.208-216.

This area was for a long time the center of marble quarrying in Canada. High calcium limestones as well as impure dolomites occur along a northeast striking zone from the international boundary to the outskirts of Bedford a distance 7 and a half miles. The magnesian limestones and dolomites are mostly all in the Cambrian formation outcroping near the shore of Missisquoi Bay and south of Rosenberg. The Beekmantown formations lying in between these Cambrian zones are generally high calcium limestones. The Cambrian dolomites are represented by the following four samples. Sample 1 represents 20 feet of strata on the east shore of Missisquoi Bay near the International boundary. Sample 2 represents the next fifteen feet down the same cliff from which sample 1 was taken. Sample 3 was collected near Missisquoi Bay, west of Philipsburg and sample 4 is from Cambrian beds southwest of Morgan Corners.

Sample	SiO_2	Fe_2O_3	Al_2O_3	$Ca_3(PO_4)_2$	$CaCO_3$	$MgCO_3$	S
1	6.82	0.97	1.05	0.17	52.98	37.85	0.05
2	4.58	0.94	0.36	0.09	54.54	38.84	0.02
3	7.12	0.85	0.61	0.04	56.13	35.11	tr.
4	4.04	0.43	0.43	0.04	53.80	41.83	tr.

SUTTON Township, Brome county.

Range VII, lot 12

Ref.: 6, 1863, p.457.

Sample 1 (below) comes from an occurrence of magnesite on this lot.

Sample	$MgCO_3$	$FeCO_3$	Insoluble
1	83.35	9.02	8.03

TERREBONNE Seigniory, Terrebonne county.

Near St. Jérome

Ref.: 1, 755, p.161.

Sample 1 was taken in a small quarry east of St. Jérome in impure Beekmantown dolomite.

Sample	SiO_2	Fe_2O_3	Al_2O_3	$Ca_3(PO_4)_2$	$CaCO_3$	$MgCO_3$	S
1	8.46	1.84	4.36	0.04	47.41	36.20	0.38

WAKEFIELD Township, Gatineau county.

Range I, lots 1 and 2.

Ref.: 10, no. 75, p.38.

An oval shaped hill measuring 1200 feet in an eastwest direction and a maximum width of 250 feet contains two bands of brucitic limestone measuring 500 and 200 feet in length respectively. The longer band situated on the northeast slope of the hill is 200 feet wide, the other band situated near the center of the hill is about 75 feet wide. Serpentine, diopside rock and limestones constitute the remainder of the hill with frequent narrow bands of brucitic limestone. Granite outcrops are found all around the hill except

to the south. The brucite granules are finer grained than elsewhere in the area, the matrix is mostly calcite. Sample 1 is representative of both bands of brucitic limestone and sample 2 was collected on outcrops and in trenches in the northwest part of the deposit.

Sample	Insoluble	Fe_2O_3	Al_2O_3	CaO	MgO	CO_2	Water + 105°C
1	1.98	0.26	0.32	35.24	22.46	30.76	9.50
2	1.72	0.39	0.18	35.44	22.70	30.23	9.64

Range I, lot 5a

Ref.: 5, no. 139, p.8.

Brucite occurs on a limestone bluff, the extent of the deposit in unknown.

Range I, lots 6 and 7

Ref.: 5, no. 139, pp. 8-9; 10, no.75, pp.33-36.

A series of hills composed either of granite or of limestone contain brucitic limestone in bodies of various sizes. One of the best occurrences is in the southern part of lots 6 and 7 where a band extends 400 feet in length with maximum width of 100 feet, serpentine is present but not abundant, the brucite granules measure 2 to 3 mm. in diameter. Sample 1 below was taken across this band. Many outcrops of brucitic limestone occur on the northwest side of the same hill where sample 1 was collected; sample 2 was collected on a number of these outcrops.

Sample	Insoluble	Fe_2O_3	Al_2O_3	CaO	MgO	CO_2	Water + 105°C
1	1.44	0.29	0.37	35.18	22.50	30.84	9.32
2	1.52	0.34	0.48	35.58	22.70	30.10	9.40

Range III, lots 6, 7.

Ref.: 5, no.139, pp.7-8; 10, no.75, p.32.

A low limestone ridge trending east-west contains many bands of brucitic limestone separated by calcitic limestone. One of the bands is 35 feet wide. The better grade material seems to be on the southern part of the hill where overburden obscures the occurrences. Development work could reveal good quality brucite ion this area.

MANGANESE

Manganese is a very important element in the ferrous as well as in the non ferrous metallurgical industries. In the steel industry it is used to remove sulphur or as a dioxidizer; ferromanganese and other manganese alloys give strength and hardness to the steel. In the non ferrous industry, manganese is used as an alloy with aluminum, nickel, chrome and silver.

Manganese dioxide is used in the manufacture of dry cells as a depolarizer; in the chemical industry sulfates, chlorides and permanganates are produced from manganese ores; in the ceramic industry manganese ore is used for certain coloring effects in glazes and in promoting the adherence of enamel to the steel.

Manganese minerals are very numerous but, only the oxydes pyrolusite, psilomelane and manganite are important as ore minerals. Wad is a mixture of various oxydes occurring in bogs; rhodocrosite and rhodonite, the carbonate and silicate of manganese are not important ore minerals.

In Canada, most of the manganese is used in metallurgy, all of the manganese ore is imported some of this ore is used in the manufacture of ferromanganese and other alloys but a good percentage of the requirement of alloys is also imported. As the steel industry grows, so does the consumption of ore and alloys.

The known deposits of manganese in Canada are considered low grade and uneconomical. The occurrences in Quebec do not compare well with some other occurrences in eastern Canada notably in New Brunswick.

In times of emergency, it may be possible to beneficiate some of our low grade ores using one of the numerous processes developed in recent years; one of these processes uses pyrite as a reagent* to leach low grade manganese ore. In the United States ores containing 10 to 20 per cent manganese are concentrated by flotation; this concentrate is then calcined, producing nodules of 57 per cent manganese.

PRINCIPAL REFERENCES

(1) Quebec Dept. of Natural Resources, Office Records.

(2) Geol. Survey of Canada, Report of Progress.

(3) Geol. Survey of Canada, Ann. Report.

(4) Quebec Dept. of Mines, Geological Report no.

(5) Mining Operations in the Province of Quebec.

(6) Report of the Commissioner of Crown Lands, Quebec.

(7) Quebec Dept. of Mines, Preliminary Report no.

(8) Mines and Minerals of the Province of Quebec, J. Obalski, 1889-90

(9) Dept. of Mines and Technical Surveys, Mines Branch, Investigation no.

(10) C.I.M. Bulletin, January 1961, pp. 43-57.

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* G. Thomas and B.J.P. Whalley, Dept. of Mines and Technical Surveys, Mines Branch R-3, 1958.

LIST OF OCCURRENCES

No manganese deposit in Quebec is of such quality or of such extent that its mining can be considered at the present time. There are numerous references in the litterature on manganese occurrences and there are listed below with a few descriptive notes.

ADSTOCK Township, Frontenac county.

Range I, lots 34, 35.

Ref.: 1 (G.W. Waddington, 1943).

These lots were staked around 1943 by Roland Bartlett of North Hartley. Pyrolusite occurs in joints and cleavage planes within slates on the north shore of Lac St. François. The occurrence measures only 20 x 20 feet and the average Mn content is about 13 per cent.

AMHERST Island, Iles de la Madeleine county.

Lots 40, 142, 446

Ref.: 1 (Numerous authors); 4, no. 106; 5, 1903, pp.70-71.

On lot 40, there is a small shaft about 5 feet square containing small nodules of manganese in the debris nearby. On lot 142, several pebbles covered with a thin layer of manganese oxide can be seen in a gravel pit. On lot 446, a bed of wad two inches thick is seen on an outcrop of foundry sand.

AUBERT GALLION Seigniory, Beauce county.

Pozer river, on west bank of the Chaudière river.

Ref.: 2, 1863, p.752; 3, vol. IV, pt. K, p. 113 (1891).

Nodular masses 2 to 4 inches thick extending for more than 2,000 feet along the Chaudière river. One sample analysed 20 per cent MnO_2.

BARFORD Township, Stanstead county.

Range IV, lots 1 and 2

Ref.: 1 (E. Larochelle, 1932).

Several pits were dug on these lots around 1932 by Raoul Martineau; wad was discovered in three of these pits. Near the center of lot 1 an analysis was made from a sample of rock which is said to contain 18 per cent manganese. According to H.C. Cooke (Ref. 4, no. 69) this area is underlain by quartzites with occasional slates and limestones.

BEAUMONT Seigniory, Bellechasse county.

Lot 170, Parish of St. Etienne

Ref.: 1 (P.E. Bourret, 1939)

About 400 feet north of the south boundary of lot 170 an outcrop of wad measuring 50' x 35' is visible. A sample collected from a pit analysed 28.70 per cent manganese.

BOLTON Township, Brome county.

Range XII, lot 20 or 22

Ref.: 2, 1863, pp. 507, 752; 1847, pp. 69-71; 3, XV, pt. S p. 167 (1907); IV, pt. K, p. 113, (1891).

Manganese filling interstices in slate; the deposit has an area of several hundred square yards, 3 to 6 inches thick; one analysis shows 26 per cent MnO_2.

CACOUNA Seigniory, Temiscouata county.

Village of La Plaine

Ref.: 2, 1863, p.752.

Manganese nodules in sand, four or five inches thick and a few yards in diameter.

CHERBOURY Township, Matane county.

Range V, lot 6

Ref: 1 (G.W. Waddington, 1949)

On the property of Roland Beaudry, joints in the slate contain thin films of wad.

CLEVELAND Township, Richmond county.

Range XIII, lot 16

Range XIV, lot 6.

Ref.: 2, 1863-66, p.45; 1876-77, p.476.

Deposit in range XIII measures 7 yards and is three to twelve inches thick, it contains concretionary nodules in clay. In range XIV bog manganese occurs, one analysis gave less than 16 per cent MnO_2.

DE CALONNE Township, Maskinongé county.

Range VI, lot 6

Ref.: 1 (G.W. Waddington, 1942).

A swamp about 100 feet in diameter on the top of a granite hill contains black soil resting on siliceous sands. The black sand contains manganese nodules in amount of about 50 per cent. The percentage of manganese in the black sand is 12.23 and that of clean nodules 45.09. The deposit measures only a few feet in diameter.

DEMERS Township, Temiscouata county.

Range IX, lot 25

Ref.: 1 (A.O. Dufresne)

Manganiferous bog iron ore.

FRAMPTON Township, Beauce county.

Between Ranges II and III, near Frampton road.

Ref.: 2, 1863, p.752; 3 Vol. IV, pt. K, p. 113, (1891).

Locality mentioned.

GASPE Seigniory, Lotbinière county.

½ mile S-W St. Apollinaire church.

Ref.: 2, 1863-66, p.45; 3, Vol. XV, p. 167S

Manganese bed 6 to 9 inches thick measuring about 20 feet across.

GRINDSTONE Island, Iles de la Madeleine county.

Lots 100 and 104

Ref.: 1 (Numerous authors); 4, no. 106; 5, 1903 pp. 70-71.

This was the property of Quebec Manganese Mines Ltd. who carried out exploration work from 1939 to 1948. An open pit measuring about 220 feet long, 30 to 60 feet wide was dug to a maximum depth of 22 feet. In addition, 4557 feet of diamond drilling were completed and three shafts were driven, one of which is 25 feet deep. In 1948, about 4,000 to 5,000 pounds of ore were shipped. The exploratory work did not prove the presence of a continuous body of manganese ore; the distribution of manganese nodules seems erratic with some richer zones difficult to outline.

HATLEY Township, Stanstead county.

Range I, lot 26

Ref.: 1 (C. Faessler, 1944).

In the Massawippi river valley the drainage is poor and conditions are good for the accumulation of bog ore. A thickness of 1.5 feet of bog ore resting on clay was found in a pit. Dark wad is especially abundant near the top of this zone. Sample 1 was collected near the surface and sample 2 is representative of the manganiferous material.

Sample	Fe_2O_3	MnO	SiO_2	CaO	MgO	Al_2O_3	S
1	39.36	18.13	8.10	1.06	0.04	1.29	0.01
2	7.23	29.78	20.88	1.26	0.26	5.92	0.02

ISLE VERTE Seigniory, Kamouraska county.

Lots 26 to 28, Parish of N.D. des Sept Douleurs

Ref.: 1 (G.W. Waddington 1942, H. Girard, 1939).

Two pits 15 feet were dug in the south half of lot 26; they show a thickness of 12 inches of wad overlain by a layer of black soil 12 to 18 inches thick containing manganese nodules. The hard pan underneath the bed of wad also contains manganese nodules. A few test holes in the vicinity did not show any extension of the wad bed. Samples were taken in the two pits representing the wad layer, the analyses gave 17.90 and 12.67 per cent manganese.

Manganese nodules are also found in the soil on lots 26 and 27.

KAMOURASKA Seigniory, Kamouraska county.

Between Kamouraska and St. Pascal.

Ref.: 2, 1866-69 p. 140; 6, 1883, p.91.

About one mile west of St. Pascal on the north side of the road, a deposit of bog iron ore contains wad near the foot of a bluff of quartzite.

LAC DES DEUX MONTAGNES Seigniory, Deux Montagnes county.

Lot 312, Parish of l'Annonciation

Ref.: 1 (G.W. Waddington, 1945).

A few lumps of wad were found in the bottom of a small stream on the property of Leopold Lecuiller.

LAUZON Seigniory, Levis county.

One mile east of line between Lauzon and St. Antoine and two miles south of the St. Lawrence river.

Ref.: 2, 1863, p.752; 3, Vol. IV, pt. K, p.113, 1891.

Bog manganese was found in a ploughed field over an area of about one acre.

MacNIDER Township, Matane county.

Range VI, lot 3;

Range VII, lot 3;

Ref.: 1 (1920).

Bog manganese occurs on these lots which were the property of Alexandre Levesque.

PANET Township, Montmagny county.

Range VIII, lot 41

Ref.: 1 (G.W. Waddington, 1942).

Etienne Ruel and Armand Campeau discovered small showings of manganese near the church of Ste. Lucie in 1942. About 100 feet north-east of the church a gravel deposit has a bed six inches thick cemented by wad; an analysis of this material gave 1.93 per cent manganese. Another showing about one half mile north of the church contains nodules

of wad in a bed 8 to 10 inches thick; the nodules are ½" to 2" in diameter and are contained in a bed of black earth. A sample of the earth and nodules gave 36.59 per cent manganese.

PORT DANIEL Township, Bonaventure county.

Range XI, lots 28, 29.

Ref.: 1 (P.E. Grenier, 1960)

Fine grained siliceous rock contains manganese carbonates. The zone has been spotted intermittently over a distance of some 1,500 feet and widths up to 60 feet. The showing was not sampled.

STE. ANNE DE LA POCATIERE Seigniory, Kamouraska county.

3/4 mile southeast of the church

Ref.: 2, 1863, p.752; 3, IV, pt. K, p.113 (1891).

Bog manganese analysing 38 per cent MnO_2. The size of the deposit is unknown.

ST. DENIS Township, Matane county.

Range VIII, lots 40-49,

Range IX, lots 48-49,

Ref.: 1 (O.D. Maurice, 1966); 7, no. 339, pp. 8-9.

In 1956, St. Maurice Minerals Corp. bored 239 holes (2 to 8 feet) at 100 foot's intervals, on these lots. Three zones containing a total of 146,000 tons of manganese bog ore were delineated, the average analysis was 8.9 per cent Mn_3O_4 and the nodules analysed 42.02 per cent manganese.

ST. GILLES DE BEAURIVAGE Seigniory, Lotbinière county.

Parish of St. Sylvestre, St. Charles Range, lot 9

Ref.: 2, 1863-66, p.45.

Bog manganese was discovered in 3 places. The beds are 2 to 6 inches thick and the areas measure about 35 feet in diameter.

ST. JOSEPH Seigniory, Beauce county.

St. Bruno Range

Ref.: 2, 1863, p.731.

Earthy oxide of manganese fills small fractures in red and green shales, vitreous copper, quartz and chlorite are associated minerals.

STE. MARIE Seigniory, Beauce county.

Range III,

Ref.: 2, 1863, pp. 730-752.

Fissures in the slate are filled with an impure oxide of manganese.

ST. MAURICE Seigniory, St. Maurice county.

Ref.: 2, 1863, p.507.

Bog manganese is found in various percentages in the bog iron ore deposits near the St. Maurice river.

ST. MICHEL Seigniory, Bellechasse county.

Range VI, lots 389-391

Ref.: 1 (P.E. Auger, 1937)

Several occurrences of bog manganese have been reported near St. Lazarre. One of these on the farm of Joseph Roy measures some 100 feet in length and only six feet in width along a stream. The bed is 6 to 10 inches thick, the nodules analysed 27.86 per cent manganese.

SILLERY Seigniory, Quebec county.

St. Louis road about four miles from the city.

Ref.: 2, 1863, p. 752; 3, Vol. XV, pt. S, p.167, (1907).

A small deposit of earthy manganese extend over 600 feet and about 15 feet wide. The thickness in the middle is 12 inches. The manganese occurs as black porous masses in sand.

STANSTEAD Township, Stanstead county.

Range IV, lot 24

Range X, lot 9

Ref.: 2, 1863, p.752; 2, 1847, pp. 69-71; 3, IV, pt. K, p.113 (1891); XV, pt. S, p.167, (1907).

On lot 24, range IV, earthy manganese, three to six inches thick extends over a few hundred yeards; on lot 9, range X, patches of earthy manganese 2 to 3 yards in diameter and a foot in thickness occur in an area of about 2 acres. The nodules in this deposit analysed 37 per cent MnO_2.

STUKELY NORTH Township, Shefford county.

Range I, lot 8

Ref.: 8, p.37.

Locality mentioned.

SUTTON Township, Brome county.

Range IX, lot 9

Ref.: 2, 1863, pp. 508, 613; 1877-78 pt. G, p.38; 8, p.20.

On this lot, a bed of ankerite containing as much as 7 per cent of carbonate of manganese is found.

TESSIER Township, Matane county.

Range V, lots 13, 17, 23.

Ranges VIII, and IX, lots 40

Ref.: 1 (P.E. Bourret, 1945; P.E. Auger, 1937, 1944).

On lot 13, range V, Eugene Truchon did some work in 1945. Many nodules of wad were found near the surface having an average diameter of one inch; a sample gave 20.11 per cent manganese. On lot 17 range V, on the land of Louis Thibault, manganese oxyde covers the slate in thin layers and some nodules are found near the stream. On lot 23, range V, on the land of Xavier Fortin, a bed 12 inches thick, 100 feet long and 6 feet wide is found; manganese oxyde is also seen as cementring material in the slate.

On lots 40, ranges VIII and IX, Joseph Caron and Albert Tremblay did some work in 1944. Fifteen shallow holes were bored and nodules of manganese $\frac{1}{4}$ to $\frac{1}{2}$ inch in diameter can be seen on some of the dumps near the holes, the nodules analysed from 22 to 25 per cent manganese.

TOURELLE Township, Gaspe North sounty.

Range III, lot 36

Ref.: 1 (P.E. Auger, 1943)

On the property of Jos. Therrien, a small deposit of wad found near the barn. An analysis of the nodules gave 24.23 per cent manganese.

TRING Township, Beauce county.

Range I, near Lambton road

Ref.: 2, 1863, p.752; 3 Vol. IV, pt. K, p.113, (1891).

Bed of nodular masses one foot or less in thickness. An analysis gave 25 per cent MnO_2.

VINCENNES Seigniory, Bellechasse county.

Parish of Ste. Etienne de Beaumont, St. Rock Range, Lots 169-172.

Ref.: 1 (P.E. Bourret, 1939).

About 400 feet north of the south limit of lot 170 a small outcrop of wad measures about 50 x 35 feet. A sample taken from a small excavation analysed 28.70 per cent manganese.

WINDSOR Township, Richmond county.

Range VI, lots 442-443.

Ref.: 1 (G.W. Waddington, 1942).

Nodules of wad are found in sand and gravel in the bed of a small creek. Some rocks nearby are covered with a thin layer of wad.

MANGANESE IN NEW QUEBEC

Ref.: 9, M.D. 3047; 10; 3, Vol. XV, p.167 S.

It is well known that many of the iron mines in the Labrador trough of New Quebec contain manganese in their ores sometimes in appreciable proportions. Attempts have been made at various times to separate the manganese and to prepare a concentrate suitable for the market. The main difficulty appears to be the required fine grinding which not only is expensive in itself but also produces an excessive amount of slimes which are difficult to recover; with such fine grinding, it was not found possible by ore dressing methods to recover a concentrate of acceptable grade. Chemical and metallurgical tests could prove in the future the feasability of preparing a marketable concentrate.

The yellow and red ores which are rich in limonite and earthy hematite respectively and are developed in certain preferential horizons, are manganiferous ores which may contain as much as 30 per cent manganese. All the rocks in the Knob Lake Range contain manganese in various percentages; the Wishbart and Ruth formations are especially rich in this element especially where leaching has increased the porosity resulting in erratic concentrations of goethite and manganese oxides.

The manganese oxides and hydroxides are the last minerals to be deposited in the ores, they fill openings such as fractures and cavities and sometimes act as a cementing agent.

On the Nastapoka Islands in Hudson Bay, there are manganese carbonate minerals associated with iron deposits. A small sample from these rocks yielded 24 per cent carbonate of manganese.

MARBLE AND CRYSTALLINE LIMESTONE

Marble is a limestone or dolomitic rock which has been subjected to high temperatures and pressures resulting in recrystallization. When a rock is capable of receiving a high polish it is often called marble although it may containing little limestone, the green serpentine rocks are good examples although the latter often take the name of Verde-antique.

Marble work was once a flourishing industry in Quebec but because of the preference of some architects for foreing marbles and because of the high cost of extraction and dressing, there is hardly any more production of marble blocks for decorative purposes; a few quarries still furnish crushed marble for the manufacture of terrazzo and artificial stone.

The colour and texture are the most important physical characteristics of marble. When used in columns and arches, the compressive and tensile strengths are also important physical properties. On floors and stairways, a hard marble is required. Our rigorous climate does not permit the use of marble for exterior works, especially when a polished surface is required, the solubility of the carbonates causes the rapid deterioration of the surface and the effect of freezing and thawing is often harmful to the stone itself.

Marble occurs in Quebec in many varieties of color and texture; quarries have been opened in several locations and there are numerous buildings throughout Canada decorated with Quebec marble. The tendency today is to use the stone in the crushed form and it may thus be useful to have a complete list of occurrences even though many of these locations could not be considered as possible quarry sites for dimension marble.

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LIST OF OCCURRENCES

ANTICOSTI Island, Duplessis county.

Near Junction of Chicotte and Galiote Rivers

Ref.: 3 (A.O. Dufresne)

A hard crystalline limestone, yellowish white to salmon in colour, is found at this location.

ARGENTEUIL Seigniory, Argenteuil county.

North side of Rivière du Nord, directly opposite the town of Lachute.

Ref.: 4 Vol. XII, p. 18 J.

An old quarry displays whitish gray crystalline limestone of Grenville age.

BATISCAN Seigniory, Champlain county.

St. Tite parish, lots 426, 427.

Ref.: 5, 1945, p.51; 4, Vol. III, p. 31A; 3 (P.E. Bourret, 1945).

Small outcrops of crystalline limestone overlying paragneiss. The showing was drilled in 1945 by Gingras & Frères, one hole intersected 30 feet of marble of various colours, the other cut through seven feet of fine grained pink marble. Older reports mention the existance of three bands of crystalline limestone in this parish one of which is pink coloured.

BOYER Township, Labelle county.

Range VII, lot 21.

Ref.: 1, 755, p.79; 9, no. 23, p.48.

Very coarse grained white dolomitic marble was quarried on this lot in 1931 by Henri Provencher. The stone contains impurities of mica and scapolite.

BROMPTON Township, Richmond county.

Range XIII

Ref.: 2, p. 213.

Green Marble Quarry Company opened two quarries near St. Denis de Brompton in 1954. The stone is almost entirely composed of serpentine and could thus be called a verde-antique. Three varieties of green marble were produced: a dark green stone with white lines of silicate minerals, a stone with parallel dark and light green bands of serpentine and a breccia composed of dark green fragments in a mass of lighter coloured serpentine.

CAMPBELL Township, Labelle county.

Range B, lot 1.

Range I, lots 8-13.

Range J, lots 7, 8, 10.

Ref.: 1, 755, p.78; 9, no. 23, p.47.

Near Val Barrette in Labelle county, crystalline white dolomite outcrops at several places and has been worked by different companies especially for terrazzo and artificial stones. Lot 8, range J, seems to have been the center of activity. A quarry was opened on this lot in 1943 by H. Jodoin. Les Mines Laurentiennes de Dolomie and Val Roc Dolomite worked the deposits from 1963 to 1965 then Airmat Corporation took over and was succeeded in 1969 by Cimex Inc. Dolomie de Québec Inc. and Tremblay Marble and Granite Quarries worked marble deposits on lots 9 and 10 range J. The latter company ships the stone to St. Leonard to be crushed and sold for the manufacture of artificial stone.

The marble on these lots is generally coarse grained, siliceous and dolomitic, it is generally white or yellowish gray and has impurities of graphite and mica.

CARTIER Township, Joliette county.

Ranges I and II, lots 28.

Range XI, lot 22.

Ref.: 4, vol. VIII, p. 24 J; 11, no. 449, p.4.

Bands of crystalline limestone are reported on these lots featured by large calcite crystals often associated with garnet, serpentine, phlogopite and olivine.

CATHCART Township, Joliette county.

Range VI, lots 8, 9.

Range I, lot 11.

Ranges IV, VII, VIII, lots 23, 27, 28.

Range IX, XI, lot 27.

Ref.: 4, Vol. VIII, p.24 J; 6, 1895, p.152 J; 9, no.92, p.13.

A quarry was opened near the boundary of lots 8 and 9, range VI. The crystalline limestone is coarse grained. Bands of crystalline limestone are found on the other lots mentioned. One band, 10 to 30 feet wide is exposed continuously along the Rouge River valley.

CHATHAM Township, Argenteuil county.

Ranges III, IV, V.

Ref.: 4, Vol. XII, p.18 J.

Bands of crystalline limestone are found in these ranges.

CLYDE Township, Labelle county.

Near la Conception

Ref.: 1, 755, p.79.

Crystalline limestone is exposed in several places near the village of la Conception. The stone is coarse grained and impure but some bands may contain limestones of better grade suitable for use in artificial stones.

COTE DE BEAUPRE Seigniory, Montmorency county.

Near Chateau Richer

Ref.: 4, Vol. V, p. 21 L.

Flesh red, pink and greenish white marble is reported at this location.

At Cap Tourmente

Ref.: 4, Vol. I, p.54 A.

A marble containing crystals of green pyroxene occurs in a band extending several miles northeastward to St. Tite des Caps.

DE SALABERRY Township, Terrebonne county.

West of St. Jovite

Ref.: 4, Vol. VIII, p.151 J.

A crystalline limestone was once quarried at this locality for the purpose of making lime.

D'AILLEBOUT-D'ARGENTEUIL Seigniory, Joliette county.

Near the road to Ste. Emilie de l'Energie

Ref.: 9, no. 92, p.13.

A band of crystalline limestone 10 to 30 feet wide extends northwestward about half a mile west of the road. The limestone is coarse grained and impure.

DUDSWELL Township, Wolfe county.

Range VI, lot 17.

Range VII, lot 16.

Ref.: 1, 279, p.220; 2, p.222; 3 (O.D. Maurice, 1967); 7, 1935-D, p.39.

These crystalline limestone deposits near Marbleton have been quarried since 1890 by Dominion Lime Ltd. A few unsuccessful attempts were made to quarry the stone for ornemental purposes, it is fine grained gray with frequent yellow streaks.

GRENVILLE Township, Argenteuil county.

Range III, lot 16.

Ref.: 1, 279, p.232; 2, p.224.

Quarrying on a small scale was carried out on this lot around 1850. There are a few varieties of serpentine marble consisting of a mixture of white calcite and green serpentine.

Range V, lot 10;

Range VII, lot 17.

Ref.: 4, vol. VIII, 49J; 8, 1901, p.58 (Mica).

Serpentine marble was found and worked on a small scale on lot 17, range VII; white crystalline limestone is found on lot 10, range V.

HARRINGTON Township, Argenteuil county.

Range V, lot 17;

Range VII, lots 7-9;

Range VIII, lots 7-9;

Ref.: 4, vol. XII, p.25J

Two large bands of crystalline limestone are found on these lots; one of these is exposed at Marble Falls on the Rouge River.

HULL Township, Gatineau county.

Range VIII, lot 18.

Ref.: 4, vol. IV, p. 127K.

Good stone was quarried from this lot within Grenville crystalline limestone.

KILDARE Township, Joliette county.

Ranges III, IV, VII

Ref.: 4, vol. VIII, p.25J; 9, no. 92, p.13.

Bands of crystalline limestone are found in these ranges. They are generally impure, coarse grained, white or pinkish.

KILKENNY Township, Montcalm county.

Range VII, lot 10.

Ref.: 4, vol. VII, p. 103J; 9, no. 91, p.11.

This lot contains bands of crystalline limestone which has been quarried for lime. Serpentine is developed in the limestone and small amounts of short fiber chrysotile have been noticed in the serpentine.

KINGSLEY Township, Richmond county.

Range I, lot 4.

Ref.: 1, 279, p.225.

Red marble occurring in association with the slates. Veins of white calcite cuts through the red marble but unfortunately quartz veins also occur.

LABRECQUE Township, Jonquière county.

Range VI, lots 9 to 12.

Ref.: 3 (P.E. Bourret, 1943); 9, no. 78, p.35.

Veins of calcite occur at the contact of granite and Trenton limestones. In 1943, La Coopérative des Minéraux du Saguenay did some trenching and two diamond drill holes to evaluate the extent of these veins; one of these is more than 1,000 feet long and 4 to 10 feet wide. In 1969, Lorenzo and Victor Grenon took an interest in this deposit to produce crushed particles for artificial stones, no production was recorded.

LACHENAIE Seigniory, l'Assomption county.

Near St-Lin

Ref.: 6, 1895, p. 153J.

Red marble occurs in Chazy limestone metamorphosed near a dyke.

LITCHFIELD Township, Pontiac county.

Near Portage du Fort

Ref.: 1, 279, p.194; 2, p.219.

There are numerous occurrences of crystalline limestone in the vicinity of Portage du Fort. A few quarries have produced marble for terrazzo and artificial stones and a small quantity has been extracted and cut into dimension stones. The marble is white of medium to coarse texture, impurities of mica and graphite and inclusions of quartz veinlets and interstratified quartzite and shale are quite numerous.

LUSSIER Township, Montcalm county.

Range II, lot 20.

Ref.: 4, vol. VIII, pp. 23J, 152J.

Bands of crystalline limestone are reported at this locality. Lime was burned from coarse crystalline bluish limestone from islands on the west side of lake Ouareau.

LYTTON Township, Labelle county.

Range I, lot 43.

Ref.: 9, no. 23, p.48.

A marble band is exposed over a length of 450 feet along the west bank of the Gatineau river just below Chute-du-Chat. Several colors are available at this location including gray, yellow, white, pink and red, some layers are uniform and others are spotted and veined. No production is recorded from this occurrence.

MANIWAKI Township, Gatineau county.

At Notre-Dame-du-Désert

Ref.: 8, 1883, p.131.

A crystalline limestone from this locality has been used as building stone.

MARCHAND Township, Labelle county.

Range III, lot 41

Ref.: 7, 1923, p.74; 7, 1934E, p.39; 1, 755, p.79; 3, P.E. Bourret (1940).

A quarry was opened in 1923 by Le Marbre National Ltée on this lot. In 1933, Canada Marble and Lime took over the property from l'Annonciation Marble Company and sold the stone in a crushed state for use in glass manufacturing and artificial stone. The marble is bluish white, medium grained and is dolomitic in composition. The numerous fractures prevent its use as a dimension stone. Impurities of serpentine, diopside, scapolite, graphite, mica and chondrodite have been noted. Some zones have been transformed into Mexican onyx.

METABETCHOUAN Township, Lake St. John county.

Range I, lots 1, 2, 3.

Ref.: 1, 755, p.174; 10, 92, pp. 22, 23 (1916); 3 (P.E. Bourret, 1938); 3 (H. Girard, 1939).

A calcite vein 20 to 30 feet wide and visible over a distance of 200 feet has been worked in 1938 and 1939 by Emile Gagnon and Eugène Gagné to supply nearby pulp mills. The rock is white or slightly pinkish and very pure; the vein is probably filling a fisfure in granite.

MILLE ISLES Seigniory, Terrebonne county.

One mile north of St. Lin

Ref.: 1, 279, p.212; 6, 1895, p.153 J.

Chazy limestone altered to marble by the heat of a dyke. The rock is red and forms a thin layer over the trap rock. Limited quarrying was done here around the 1890's.

ORFORD Township, Shefford county.

Range F, lots 10, 11, 12

Ref.: 1, 279, p.210; 2, p.215; 3 (O.D. Maurice, 1952, 1965); 5, 1946, p.50.

Several deposits of coloured marble are worked since 1945 by the Orford Marble Co. Ltd. Shear zones in peridotite and breccia with large red, green or black fragments cimented by white or red calcite result in a variety of marbles of attractive colours. This stone has been used in dimension form as well as in the crushed form for terrazzo.

PELLETIER Township, Roberval county.

Range IV, lots 43, 44.

Ref.: 1, 755, p.170; 3 (P.E. Bourret, 1952, 1962); 7, 1933, Pt.D.

There are many outcrops of Grenville limestone in Pelletier township especially on lots 20 to 26, range III and lots 33 to 35 and 42 to 44, range IV. The deposit occurring on lots 43 and 44, range IV has been in continuous operation since 1932. It was opened by the Trappist Fathers of Mistassini, who mined it until 1962 selling most of their product to the St. Lawrence Corporation at Dolbeau but also producing terrazzo chips, agstone and poultry grit. The deposit is now worked by "Les Calcites du Nord" who serve the same clients as before with more emphasis on artificial stones which are produced in a plant at Hebertville. The current production is about 300 tons per day of crushed stone and 100 tons per day of coarse material for pulp mills.

This deposit measures about 500 feet in diameter and has been worked to a depth of more than 60 feet. The rock is coarsely crystalline and is cut by numerous granite dykes.

Another deposit of crystalline limestone has been worked since early 1969 by Grenon & Frères Ltée on lots 40, 41 and 42, range IV of Pelletier township. The mill produces about 400 tons of crushed stone per day.

POLETTE Township, Laviolette county.

Range II, lot 18.

Ref.: 4, no. XI, p. 117A; 3 (P.E. Bourret, 1944).

Many outcrops of crystalline limestone occur over a distance of 500 feet and a width of some 400 feet. The deposit is about 3 miles west of the St. Maurice River. The limestone is generally dolomitic but the magnesium content varies considerably from one outcrop to the other.

PONSOMBY Township, Papineau county.

Range VII, lot 41 N½

Ref.: 3 (A. Deland, 1963; O.D. Maurice, 1965).

This deposit of white marble was opened by Viateur Deschamps in the early sixties. In 1963, Gerard Drouin who was the owner of the mining rights on this property, drilled seven holes in the limestone deposit. In 1965, two companies worked the deposit simultaneously, Marbre Blanc Laurentide Inc. and Airmat Corporation who had obtained the mining rights from Gerard Drouin in 1964.

The crystalline limestone is in contact with pink granite, it is highly fractured and serpentine develops where the fracturing is more intense. Fragments of serpentine 5 to 10 inches in diameter are surrounded by a zone of blue calcite. Bands of limestone and dolomite alternate, the former is usually white and the latter more often yellow.

PONTEFRACT Township, Pontiac county.

Range A, lot 10.

Ref.: 8, 1888, p. 93.

Thick beds of close-grained crystalline limestone occur on this lot.

PORT DANIEL Township, Bonaventure county.

Port Daniel Bay

Ref.: 1, 279, p.223; 2, p.223.

Silurian limestones in Port Daniel Bay are partly recrystallized. Several varieties are present, one is red almost brown cut by veinlets of white calcite.

RAWDON Township, Montcalm county.

Range IX, X, XI

Ref.: 4, vol. VIII, p. 152J; 9, no. 42, p.13.

Large exposures of crystalline limestone are present in these ranges. Lime kilns were operated on lot 28, range X and XI. This band of marble is part of a continuous exposure of crystalline limestone extending along the Rouge River in Cathcart and Rawdon townships. The limestone is impure, coarse grained, white of pinkish and contains an abundance of biotite and serpentine.

RIGAUD-VAUDREUIL Seigniory, Beauce county.

Parish of St. François, lots 1324 and 1327.

Ref.: 3 (P.E. Bourret 1944, 1946).

This deposit contains a breccia type marble with brownish pink or gray fragments in a light to dark green groundmass. Many outcrops were uncovered along a line 400 feet long and 100 feet wide by Romeo Poulin between 1944 and 1948. The rock gives a beautiful polish. The deposit has only been scratched near the surface where the stone is highly fissured and fragmented, better quality stone may exist at shallow depth.

ROBERTSON Township, Labelle county.

Range VI, lot 34

Ref.: 9, no. 23, p.49.

A grayish white crystalline limestone contains evenly distributed grains of serpentine which gives the stone and attractive appearance when polished.

STE. ANNE DE LA PERADE Seigniory, Laviolette county.

Range B, North, lots 199-203, parish of Ste. Thècle.

Ref.: 1, 279, p.199; 3, (T.C. Denis 1912); 5, 1945, p.51; 2, p.220.

Many attempts have been made since 1911 to quarry the marble of Ste. Thècle situated some 4 miles northwest of the village.

The colour of the stone is white or pink, sometimes greenish near inclusions. These inclusions of basic igneous rocks are quite numerous and they constitute the main objection to the utilization of this stone in dimension form.

ST. ARMAND Seigniory, Missisquoi county.

Ref.: 1, 279, p.212; 2, p.209.

The marbles in the vicinity of Philipsburg, have been quarried on a larger scale than any other marble in Canada; the limestones of Beekmantown age are very pure at some locations and have been burned for lime. A zone some five miles long extending from the international boundary to Morgan corners has been metamorphosed into marble and has been quarried since 1905 by various companies starting with Missisquoi Marble Company, then Missisquoi Lautz Marble Limited, then Wallace Sandstone Quarries Limited and finally by Missisquoi Stone and Marble Company Limited who have operated a quarry and plant almost continuously from 1936 to 1962 when the company went bankrupt. Several varieties of marble were marketed and the examples of utilization of this stone are very numerous throughout Canada. White, green, gray, yellow and black are the main colours encountered in this deposit.

ST. JOSEPH Seigniory, Beauce county.

Lots 422-425, 433.

Ref.: 1, 279, p.222; 1, 755, p.189; 2, 222p.; 3 (A.O. Dufresne, 1916; R. Paquet, 1958); 10, no. 127, p.88).

This deposit of red marble cut by white calcite veinlets were first examined in 1900 by Mr. T. Morisson and were acquired

in 1911 by Major Rupert Simpson of Simcoe Ontario who organized the British Canadian Marble Company Limited. This company worked the deposit especially for its red slates utilized in the manufacture of roofing paper. From 1925 to 1940, the property was owned first by Theodore Gilbert and Louis Morin who sold their rights to Cap Products; the latter did not operate the quarry. Mab Limited took over the property in 1940 but were not successful in their operations. The last operator had again the name of British Canadian Marble Company Limited; they produced a few tons of terrazzo chips in 1961.

The marble zone can be traced for a distance of some 2 miles in a N53°E direction, the enclosing rocks are red and green schists and also volcanic rocks. The stone is light pink to dark red cut by numerous veinlets of white calcite and occasional quartz. The deposit is not suitable for the production of dimension stone but could represent a good source of crushed marble for artificial stone and terrazzo.

STANBRIDGE Township, Missisquoi county.

Ref.: 1, 755, pp. 206-225.

The metamorphosed band of limestone which has been extensively quarried for dimension stone in St. Armand Seigniory extends northward into Stanbridge township as for north as Morgan Corners. This band of limestone is high in calcium and has been

extensively quarried for agricultural and industrial purposes. Where the limestone is altered to marble, it is quarried for the manufacture of terrazzo and artificial stone.

One of these quarries was opened around 1960 by Brault Stone Products Reg'd. in St. Henri range and acquired in 1962 by Carrières St-Armand Limitée; about 90% of the production is used in terrazzo. Messier Terrazzo and Stone Products had another quarry on lot 34 of Stanbridge township, this property was acquired in 1959 by Champlain Terrazzo and Marble Products Limited but the operations lasted only a few months.

STANSTEAD Township, Stanstead county.
Range II, lot 12.
Ref.: 1, 279, p.225; 1, 755, p.240.

At Magoon point, silurian marble was at one time extensively quarried for making lime. The stone is fine grained bluish white and banded.

STUKELY Township, Shefford county.
Range I, lots 6, 7.
Ref.: 1, 755, p.232.

This quarry was operated in 1933 by Canadian Rock Products who produced road metal. The stone has many characteristics similar to that of Dominion Marble in range II. On lot 27, Waterloo Marble Limited are quarrying a white marble for use in artificial stones and agricultural purposes.

Range II, lot 8.

Ref.: 1, 279, p.203; 1, 755, p.234; 2, 218p.

This quarry was operated from 1910 to 1914 by the Dominion Quarry Company later called Dominion Marble Co. Limited; the site had been active in the production of lime for a period of 30 years preceeding 1910. Several varieties of marbles with tints of yellow, pink, green and blue were quarried and sold as ornemental stone; examples of utilization can be seen throughout Canada including the Chateau Laurier in Ottawa. From 1960, Waterloo Marble Limited have operated a quarry of green marble on the same lot.

Range III, lot 274

Ref.: 3 (Ls.-H. Rinfret, 1963)

This quarry was operated from 1948 when J.E. Langlois organized the South Stukely Marble & Terrazzo Company to be replaced in 1957 by Langlois et Frères Enr. The output has been irregular consisting of white terrazzo chips and artificial stones which were manufactured nearby.

Range VII, lot 13 E½

Ref.: 1, 279, p.209; 1, 755, p.235; 2, p.218.

Delbo Incorporated is now the operator of this quarry which has known a long history of intermittent production starting in 1871.

In 1878, Ferdinand Lachance furnished the stone from this quarry to build the church at Notre-Dame-du-Bonsecours. The production has been mostly for lime which was manufactured on the site, agricultural stone and terrazzo chips. The production of dimension stone has been very small. The stone is generally white and the texture medium grained. Blue and yellow strips are of frequent occurrence.

MICA

There has not been any production of mica in Quebec since 1966 when Blackburn Brothers Limited closed its mine at Cantley, all the other small operators who had sold their production to Blackburn Brothers also ceased operations in that year. Records of production of mica in Quebec date back to 1886, since that time the activity in the mineswas continuous with production peaks during the war years.

In spite of great efforts to find substitutes for mica, it is still the only material which combines all the properties useful in electrical insulation. Canada imports ground and sheet mica for use in paints, rubber, gypsum products, paper and electrical insulation. Most of the sheet mica is produced in India and sold to brokers in the United States who sell it in turn to Canadian users. India is the most important producer of sheet mica; in 1965-66 there were 700 producing mines in that country and hundreds of thousands of experienced cutters and graders who worked for low salaries compared to Canadian standards. Since mining and preparation for market demand such a great number of experienced hands, it is not possible to produce mica in Canada at competitive prices in ordinary times.

The price of mica varies greatly dependent on the size and quality of the product; the American Society of Testing and Materials in its designation D 351-62 grades block and film muscovite according to size, visible stain and other imperfections. Specifications for splittings used in the manufacture of built-up sheet mica are found in designation D 2131-65, and specifications of block and film muscovite for use in dielectric capacitors are given in designation D 748-59. For ground mica, the price varies according to the type of grinding, the fineness, the bulk density, the moisture content and purity of the product (ASTM Designation D 607-42).

The purchaser may thus pay from 2 or 3 cents per pound for coarse dry ground mica up to $25.00 per pound or more for sheets of 50 squares inches of unstained or slightly stained muscovite.

A list of old, recent or possible location of good quality mica is only useful for the eventuality that interest could be renewed by unusual circumstances such as occurred during the world wars. The list of deposits which have been the source of mica in the past is quite long, many attemps have been made also to recover mica as a by-product during the mining and milling of other minerals. One must keep in mind that mica is an important constituent of many igneous and sedimentary rocks and it is always considered a possibility to recover the mineral during the treatment of ores. The mica

business is very complex and when all factors are considered, it will be found in most cases that it is preferable to discard the mica than to go through the expense of recovering it as a by-product.

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In the list that follows, the notes emphasise the history of the deposits and very little is said about the geology. The geological settings are quite similar in most deposits and even summary description would involve many repetitions which would lengther the text considerably. For geological details, the reader should consult the references listed.

List of occurrences

ALDFIELD Township, Pontiac county.

Range VIII, lot 53

Ref.: 1, p.19; 7, 1900, p.23.

A mica prospect existed on this lot around the year 1900.

ALLEYN Township, Pontiac county.

Range I, lot 12

Ref.: 1, p.18; 3, p.129; 4, p.66; 5, p.57.

The Haycock mine was opened in 1895 by E.B. Haycock on the farm of John Gibson. Dark amber mica occurs in pink calcite veinlets within pyroxenite. Work was suspended after a few months because of water difficulties.

Range II, lot 3

Ref.: 3, p.130; 4, p.66.

The Anderson mine was worked in 1907-1908 producing some 700 pounds of dark amber mica. The occurrence is similar to the proceeding.

Range II, lot 4

Ref.: 1, p.18; 3, p.130; 4, p.66.

A dark amber mica was extracted from this occurrence known as the Moore and Marks Mine. It was opened in 1898 and was active during three years, in 1905 the Laurentide Mica Mining Co. operated the mine for a few months. This deposit is remarkable for the dimension of the mica crystals some of which measured as much as 4 feet across and weighed more than 3,000 pounds.

Range II, lots 6, 7

Ref.: 5, p.57.

Good mica indications on these lots.

Range II, lot 10

Ref.: 1, p.18; 3, p.130; 4, p.66; 7, p.38, 1898; 7, p.60, 1903.

This is the Ellard Mine first worked in 1898. During four years of operation it produced about 200 tons of mica. The mica occurs in a fractured zone within a dark green pyroxenite.

Range III, lot 4

Ref.: 3, p.131; 4, p.66.

This deposit belonged to James Jamieson who rented it to M. Kilt in 1907. There is much distortion in the mica crystals and the deposit is small. Operations lasted only during a short period.

AMHERST Township, Papineau county.

Range VIII, lots 1, 2 W½

Ref.: 8 (A. Deland, 1962)

This deposit was initially developed in 1954 by W.R. Côté who sold mica to Blackburn Brothers and to Mica Company of Canada Ltd. Production was recorded in 1954, 1956, 1957 and 1961. Phlogopite, pink and white calcite and apatite are the principle minerals occurring in pegmatite veins cutting granite.

ARUNDEL Township, Argenteuil county.

Range IV, lots 24, 26, 27

Ref.: 4, p.67; 9, 1936-C, pp. 23, 34.

Amber mica is reported from these lots but there was very little production. One of the deposits on lot 24 is unusual since the mineral occurs as a vein in granite instead of pyroxenite.

ARMAND Township, Gatineau county.

Range B, lots 6, 7, 13, 14, 20.

Ref.: 3, p.138; 4, p.61; 5, p.55; 10, no.50, p.30; 10, no.23, p.53.

Phlogopite was mined from some of these deposits but there is much waste due to distortions and inclusions. Elston-Wallingford Mineral Exploration reported a small production in 1949.

AYLWIN Township, Gatineau county.

Range II, lot 4

Ref.: 7, 1900, p.22.

The Mulligan Mine was worked around 1900 by Richard Moore who extracted good quality amber mica.

Range III, lot 7

Ref.: 3, p.119; 4, p.60.

This mine belonging to H. Flynn was worked intermittently during the early part of this century. The mica books are of fair dimension but there is considerable distortion.

Range IV, lot 7

Ref.: 3, p.136; 4, p.60; 5, p.51; 11, 1892, p.87.

This deposit known as the Ryan Mine was prospected in 1892 and produced some clear mica crystals.

Range X, lot 35

Range XI, lots 40, 41, 43

Ref.: 3, p.136; 4, p.60; 5, p.51; 7, 1898, p.40.

There are indications of mica on these lots. Charles Snob prospected lot 40 or 41, range XI in 1898.

BEGIN Township, Dubuc county.

Range IV, lots 30, 34

Range V, lots 30, 31

Range VI, lot 30

Ref.: 8 (P.E. Bourret, 1939); 7, 1939, p.37; 10, no. 78, p.36.

A muscovite deposit on lot 30 straddling the line between ranges V and VI was worked in 1939 by the Chicoutimi Mica Products Limited and by Roberval Mica Corporation Registered; about 29,000 pounds of mica were produced. The mica occurs in a pegmatite cutting anorthosite, the crystals are generally small but some measure 5 inches in diameter; the quality is mixed, some of the mica is clear but some is badly stained. The pegmatite dyke contains less than 5 per cent of muscovite.

BERGERONNES Township, Saguenay county.

South of Block H

Ref.: 8 (P.E. Bourret, 1940, 1942); 6, p.62; 10, no.32, p.12 (F); 12, 1940, p.24; 12, 1944, p.37;

This property was acquired in 1940 by Eugene Simard and by Jos. Beauchemin in 1942; the latter produced mica almost continuously until 1943 when the mine was acquired by Mica Laurentien Ltée. The muscovite occurs in pegmatite dikes intruding quartzites of Grenville age. Mica books as large as two feet in diameter have been found, crystals three to six inches in diameter are quite common. The other minerals in the pegmatite are feldspar, quartz, biotite, tourmaline, apatite and beryl.

Block G, N.E. of Charlotte Lake

Ref.: 2, p.13; 3, p.194; 4, p.83; 5, p.21; 6, p.82; 8 (P.E. Bourret, 1961); 9, 1929-D, p.84; 10, no.32, p.15 (F); 9, 1933-A, p.45; 11, 1892, p.89; 11, 1893, p.105; 11, 1894, p.98.

This mine was found in 1891 by D. McGee who worked it until 1894. In 1933, Albert Chartier acquired the mining rights on the property and North Shore Mica Mining Limited was organized to exploit it. A few hundred pounds of mica were produced in 1933 and 1934, and another 500 to 600 pounds are reported to have been produced in 1941 probably by Mica Laurentien Limitée. In 1943, Amic Mica Mines Limited cleaned out the pits and reported a production of about 140 pounds of mica from this operation.

There are two pegmatite dikes on the property, one lies about 600 feet north of Charlotte Lake in the western part of Block G, it measures 12 feet in the wider portions and its length is 140 feet; the other dike is seen on the shore of the lake in the south part of Block G, it is traced for a length of 200 feet northward. These dikes intrude quartzites and biotite paragneiss.

Range VI, lots 38, 39

Ref.: 8 (P.E. Bourret, 1939); 9, 1929-D, p.85; 9, 1933-A, p.46; 10, no.32, p.16 (F).

The first activity at this location known as Lac Duclair mine was in 1897; in 1932 there was some activity and again in 1934 by Albert Chartier who is said to have extracted several hundred pounds of mica. In 1939, International Mica produced a few hundred pounds. The mica occurs in a pegmatite dike cutting formations of quartzite and deformed schist, it was uncovered for a length of 65 feet and a maximum width of 20 feet. The muscovite books constitute about 5 per cent of the pegmatite and are one to three inches in diameter.

North of Lake Sirois

Ref.: 8 (P.E. Bourret, 1937, 1941); 9, 1936-A, p.40; 9, 1937-A, p.42; 10, no.32, p.17 (F).

This deposit was discovered around 1936 by Eugene Simard who worked it during a few months. In 1938, the property was again active under the direction of Ephrem Marcil. Pegmatite lenses intrude into schists and quartzites and contain muscovite of good quality measuring two to three inches in diameter. There is much tourmaline and garnet associated with the feldspar and mica of the pegmatite.

The pegmatite dikes and lenses can be traced over a distance of more than 3,000 feet in a northeast direction west of Lake Sirois, they have not been worked at any other location than on the Simard property but muscovite in large crystals has been observed and further exploration could uncover deposits of interest.

West of Beaver Lake

Ref.: 8 (P.E. Bourret, 1941); 10, no.32, p.20.

This property known as Du Ruisseau Mine was worked in 1941 by Louis-Joseph Fortin. A pegmatite dike was uncovered over a length of 450 feet and a width of 95 to 100 feet. The mica crystals are of good quality and measure three inches average diameter.

South of Lake Denis

Ref.: 2, p.14; 3, p.195; 5, p.22; 6, p.82; 8 (P.E. Bourret, 1937); 9 1929-D, p.84; 9, 1933-A, p.45; 10, no.32, p.21 (F); 11, 1893, p.105; 11, 1894, p.98; 12, 1941, p.22.

This property is known as the Hall Mine or Beaver Lake Mine but it is closer to Lake Denis than to Beaver Lake. It was first worked in 1893 by P.P. Hall and was acquired by the Canadian Mica Company who went bankrupt in 1898. It was reopened in 1938 by the Tidewater Mineral and Mines Co. Ltd. but all work stopped in 1939.

Pegmatite dikes and lenses outcrop at intervals along a N.E. line more than one mile long between Beaver Lake and Lake Denis. Near Lake Denis the zone measures about 400 feet in width with individual occurrences 150 feet wide. The country rock is schist. The mica is of good quality but the books are generally of small diameter attaining 4 inches in some instances.

N.E. of Lake Denis

9, 1933-A, p.46; 10, no.32, p.20 (F).

This deposit is known as the Imbeault mine (or Osler Mine) it lies about one mile N.E. of Lake Denis and a little more than a mile south of Imbeault Lake. Several hundred pounds of mica were extracted in 1933 and 1934 by Albert Chartier.

The pegmatite intrudes paragneiss and schist. The mica is of good quality attaining four to six inches in diameter in books up to one inch thick.

South of Lac à la Mine

Ref.: 2, p.14; 3, p.195; 5, p.23; 8 (P.E. Bourret, 1938); 9, 1929-D, p.85; 10, no.32, p.24 (F).

This mine was first worked in 1892 by Messrs. Dupuis and Latimer. In 1938, Isaac Gourdeau worked the mine and a good road was built to the property. Les Entreprises Equitables Ltée took over the property in 1939 and sold some mica in 1943. The pegmatites are in the form of small lenses, 10 to 50 feet long and 1 to 3 feet wide. Ruby mica of good quality having a maximum diameter of 6 inches but generally not more than 3 inches is found in these pegmatites with apatite, tourmaline and garnet.

Block H

Ref.: 8 (P.E. Bourret, 1943)

In 1943, Henri Bélanger acquired the mining rights on block H and some claims surrounding the Simard Mine. A limited amount of trenching was done to the west of Beaver Lake where pegmatite was uncovered around 1893. No production was ever recorded from these showings.

Block F

Ref.: 5, p.23; 11, 1892, p.89; 12, 1942, p.31.

In 1942, Edouard Boulianne produced a small quantity of mica from this property which was acquired by the Pierre Beauchemin interests. There are two narrow pegmatite lenses on this property containing muscovite in abundance.

Block I (N.E. of Block G)

Ref.: 4, p.83; 5, p.22; 9, 1929-D, p.84; 11, 1893, p.106.

This property known as the Moreau Mine lies about 2,500 feet north of the McGee Mine near Lake Charlotte. Mr. L.A. Robitaille was the owner at the turn of the century. It was worked in 1940 by Willie Simard and J.F. Gauthier who sold a small quantity of mica to the Mica Company of Canada.

BIGELOW Township, Papineau county.

Range V, lot 52

Ref.: 3, p.66; 4, p.66.

This deposit of dark amber mica was discovered around 1910 by W. Parker and worked around 1914 by W. Cameron. In 1942 and 1943, the Micambia Prospecting Syndicate did some work on the property and produced a small tonnage of mica. The phlogopite crystals occur in pyroxenite with white and yellowish calcite. The mean diameter of the crystals is about 6 inches.

Range V, lot 53

Ref.: 13, no.215, p.13.

This property owned by the Wells Mica Prospecting Syndicate was worked in 1942 when a small tonnage of mica was produced. Phlogopite was also discovered on lot 36, range II and lot 10, range V of Bigelow township, no production was recorded from these showings.

BLAKE Township, Gatineau and Papineau counties

Range III, lots 34 to 37

Ref.: 8

In 1953, Odilon Caron reported a small production of phlogopite from these lots. All work ceased in 1955.

Range IV, lot 43

Ref.: 3, p.120; 4, p.66; 13, no. 196, p.16.

Some mica was sold from this lot in 1909 by Cornelius Teeples. The phlogopite is of good quality and is associated with pink calcite.

Range V, lot 1

Ref.: 3, p.120; 13, no.196, p.16.

Worked ans prospected by J.H. McGee in 1910.

Range VII, lots 3, 4, 5, 6, 23

Ref.: 3, p.120; 13, no.196, p.16.

Mica has been prospected and in some cases mined on these lots. On lot 23, Antoine Serré produced a small quantity of mica around 1900.

Range VIII, lots 5, 8, 14, 23

Ref.: 13, no.196, p.16; 8 (P.E. Bourret, 1954).

Mica was noted on all these lots. John Cherney produced about 250,000 pounds of mica from 1951 to 1954 from lot 14; this deposit was opened in 1907 by H.T. Flynn. Three parallel veins in pyroxenite are exposed over a length of 100 feet. The mica is abundant but badly cracked and so the output was sold mainly as scrap to Blackburn Brothers Limited at Cantley, Quebec.

Range IX, lots 6, 16, 22, 23

Ref.: 3, p.121; 11, 1898, p.41; 13, no.196, p.16.

Of these occurrences, lots 16 and 22 are more important. The deposit on lot 16 was worked by Cornelius Teeples and H.F. Flynn

around 1910, only a small production was recorded. Lot 22 was first worked by Mr. Caron who sold to O'Brien and Fowler around 1910. The latter did much development work but no production was recorded. At the surface the mica is iron stained and of little value.

BOISCLERC Township, Temiscamingue county.

6 miles N.E. of Mattawa

Ref.: 4, p.84.

This deposit was mined in the early part of this century by the Mica Company of Canada who produced about 150 tons of muscovite. The mineral is clear, brownish green and crystals up to 14 inches in diameter are said to have been obtained from the workings.

BOUCHETTE Township, Gatineau county.

Range D, lots 14, 15

Ref.: 11, 1897, p.281.

These deposits of phlogopite were worked around the turn of the century by the Webster Company and M. Morin respectively for lots 14 and 15.

Range I, lots 24, 31, 38, 39

Ref.: 1, p.17; 5, p.54; 11, 1897, p.281; 13, no. 183, p.17.

Lot 24 is the Grace Mine opened around 1890 and later worked by Webster & Co. and by Henry Flynn. Webster and Co. also worked on lot 38. Lot 39 had more recent activity when J.H. Poirier and L. McDougall did some development work in 1938 on the old Johnson Mine; no production was recorded from the latter operation.

BOWMAN Township, Papineau county.

Range III, lot 17

Range IV, lots 1, 13, 14

Range V, lots 27, 28

Range VII, lots 18, 19

Ref.: 4, p.65; 11, 1883, p.127; 13, no.223, p.9.

Phlogopite occurrences were noted on these lots. Adelard Morin worked the deposit on lot 17, range III, and Watts and Noble did some work on lots 27, 28, range V. All activity ceased around 1920.

BUCKINGHAM Township, Papineau county.

Range IV, lots 21, 25

Ref.: 3, p.59; 4, p.64; 5, p.47; 7, 1899, p.36; 7, 1900, p.22.

A small production of mica was recorded in 1899-1900 by Messrs Tetreau and Richard. There has not been any activity since that time.

Range VII, lots 26 S½

Ref.: 5, p.47; 7, 1899, p.36.

This deposit was prospected in 1899 by N. Charest.

Range IX, lot 20 S½, 27, 28

Range X, lot 20 S½

Ref.: 14, p.141.

Mica occurrences are reported on these lots.

Range II, lot 33;

Range IV, lot 7

Range IX, lot 35.

Ref.: 4, p.61; 5, p.54; 13, no.196, p.16.

Mica showings.

Range X, lots 10, 11, 12, 24.

Ref.: 5, p.54; 11, 1885, p.116; 11, 1892, p.87.

Muscovite showings.

BOURGET Township, Dubuc county.

Range VII, lot 46

Range VIII, lot 44

Ref.: 10, no.78, p.36; 11, 1897, p.283.

Muscovite occurrences in small pegmatite dikes have been noted on these lots.

BOUTHILLIER Township, Labelle county.

Range VII, lot 55

Ref.: 13, no.187, p.11.

Some prospecting was done in 1941 on this lot near the east shore of David Lake; phlogopite crystals of possible economic interest were found. A small production was recorded in 1960 and 1963 by Mont Laurier Mica Reg'd.

Range XI, lots 26, 28, 36

Ref.: 7, 1903, p.60; 13, 1892, p.87.

J.J. Noble produced a small quantity of mica from lot 28 in 1903; the property was later worked by J.B. Gauthier but we have no record of production by the latter.

Range XII, lots 12, 13, 14

Ref.: 3, p.199; 4, p.64; 5, p.19.

The Pearson Mine was worked mainly for feldspar but large crystals of muscovite are also present; these are highly stained and have little economic value. The last operation recorded on these lots were by J.B. Gorman around 1925.

Range XII, lot 19

The Emerald Mine which was one of the most important phosphate mines produced mica as a by-product in the closing years of the last century.

CALLIERES Township, Charlevoix county

East of La Roche Lake

Ref.: 12, 1942, p.31; 13, no.244, p.6 (F).

In 1942, Roy Kelly Mineral Exploration Partnership did some work on a muscovite prospect at this location. There has been intermittent activity at several locations in this township since 1911.

CAMERON Township, Gatineau county.

Range II, lot 10

Ref.: 3, p.127; 4, p.61; 13, no.196, p.16.

This is the Cleland Mine opened around 1912 and operated on a small scale for a few years; all operations ceased before 1919. The phlogopite is light coloured and is associated with apatite and some pyrite.

Range II, lots 11, 12, 13, 14, 38

Ref.: 3, p.128; 4, p.61; 5, p.55; 7, 1909; 11, 1897, p.283.

These mica showings are known since the early part of the century. They were worked from 1909 by Messrs. Lacroix and Cleland of Bouchette. Lots 11, 12 were at one time the property of Mrs. Moore and lots 13 and 14 belonged to H.T. Flynn, the mine was called the Marguerite. There has been no activity since 1919.

Range III, lots 5, 50, 51

Ref.: 4, p.61; 8 (A.O. Dufresne, 1924); 10, no.50, p.30.

Small scale mining was reported on these lots but all activity has ceased before 1924 at which time J.B. Nault was the owner of the deposit on lot 50.

Range IV, lots 44, 46

Ref.: 8

Work was done on lot 44 as recently as 1938 by L.S. Bernatchez; the mica deposit on lot 46 belonged to Jean Gagnon and has been idle since 1919.

Range VII, lot 47

Ref.: 10, no.50, p.30.

A deposit of phlogopite on this lot has received very little attention.

CAMPBELL Township, Labelle county.

Range I, lot 19

Ref.: 10, no.23, p.53.

Small pockets of phlogopite in paragneiss associated with molybdenite. No production was recorded.

CAWOOD Township, Pontiac county.

Range II, lots 21, 22

Range III, lots 23, 24, 49

Ref.: 7, 1898, p.39; 13, no.346, p.6 (F); 14, p.141.

These locations contain phlogopite deposits which have received more or less attention in the past. As usual the mica occurs in pyroxenite associated with calcite.

Range IV, lots 23, 24, 41, 43, 45

Ref.: 7, 1898, p.39; 11, 1897, p.283.

The most recent operations on these mica deposits was from 1961 to 1965 when Charles Zimmerling and James McNelley produced a small amount of phlogopite from lot 45.

Range V, lots 40, 46

Range VI, lots 12, 13, 14, 18, 43

Ref.: 3, p.132; 4, p.66; 7, 1898, p.39; 7, 1899, p.37; 9, 1909; 13, no.346, p.6 (F).

The Cawood Mine on lot 43, range V, seems to have been developed more than the others with tunnels several hundred feet in length. The Priestley Mine on lot 13, range VI was opened about 1900 by Messrs. Pritchard and Brock and produced only a small quantity of mica. The deposit on lot 14, range VI was worked during a few weeks in 1900 by Messrs. Powell and McVeity.

On lot 18 of the same range Messrs. Brock and Pritchard operated a mine intermittently from 1898 to 1906. Thomas Stephens operated the mine on lot 43, range VI during several years preceeding 1918. One of the openings is 30 feet deep and has produced yellowish amber mica of medium size.

CHARLEVOIX County, Undivided portion

One half mile S.E. of Lake Boulianne or 23 miles N.W. of the Quebec-Malbaie road and near the N.E. arm of Rivière-du-Gouffre.

Ref.: 8 (P.E. Bourret, 1939).

This deposit was developed around 1939 by Godin and Martin Exploration and taken over the same year by Lemargo Mining Co. Ltd. Muscovite occurs in a pegmatite with garnet, apatite and biotite in addition to feldspar and quartz. The crystals of muscovite constitute about 15 per cent of the rock, the largest being about three inches in diameter. Nothing but "scrap mica" was extracted from the deposit.

CHATHAM Township, Argenteuil county.

Range IV, lot 28

Range X, lot 17

Ref.: 5, p.59; 9, 1936-C, p.35; 11, 1892, p.88.

Occurrences of phlogopite noted. The Montcrief Mine prospected around 1892 was on lot 28, range IV.

CHAUVEAU Township, Charlevoix county.

11 miles N.E. of St. Siméon and 1.5 miles of Chicoutimi road.

Ref.: 8 (P.E. Bourret, 1942).

Muscovite of excellent quality but of small size was found at many locations in this area prospected by Moris Maltais around 1942.

CLARENDON Township, Pontiac county.

Range I, lot 14

Ref.: 5, p.57; 11, 1892, p.88.

This location was prospected for muscovite around 1892.

COTE DE BEAUPRE Seigniory, Montmorency county.

Parish of l'Ange-Gardien, Range I, lots 6-1, 8

Ref.: 4, p.67; 5, p.59; 7, 1914, p.47; 7, 1915, p.39; 8 (P.E. Bourret, 1935, 1938, 1941); 9, 1935-A, p.32; 9, 1937-A, p.42; 12, 1940, p.24; 12, 1941, p.21; 12, 1942, p.31.

This deposit known as the Richard Mine was worked intermittently from 1914 to 1943. In 1935, the Laurentide Mica Mines Syndicate Limited was succeeded by the St. Lawrence Mica Mines Ltd. and in 1939 the latter company became the St. Lawrence Mica Corporation Ltd. All operations ceased in 1943. The mica is brownish phlogopite, it occurs with calcite in fractured pyroxenites. From 1914 to 1943 a total of some 250,000 pounds of mica was produced from this deposit having a value of about $30,000.

Parish of Château Richer

Range I, lots 357-360

Ref.: 8 (A.O. Dufresne, 1922)

On these lots, the Sherbrooke Saguenay Mica Co. extracted biotite around 1922. The crystals are said to measure up to 18" in diameter and the selling price was 25¢ per pound. It was used in the manufacture of micanite or mica plate which replaces natural sheet mica for insulation purposes in electrical equipment.

DAIMAS Township, Roberval county.

Range VIII, lots 25, 26

Ref.: 8

In 1942, Saguenay Minerals Reg'd did some work on this property which was taken over in 1943 by the "Cooperative des Minéraux du Saguenay". A small production was recorded in 1943.

DE MAISONNEUVE Township, Berthier county.

Range II, lots 1, 2.

Ref.: 2, p.17; 3, p.200; 4, p.84; 5, p.19; 7, 1906, p.42; 9, 1906, p.24; 9, 1928, p.172; 14, p.141.

The Maisonneuve Mine was opened around 1892 at which time it was called the Baxter Mine. In 1906 the Canadian General Mining Co. Ltd. did some work on the deposit presumably in search of radioactive minerals. In addition to muscovite, the

pegmatite contains biotite, tourmaline, beryl, garnet and samarskite. The mica is generally of small dimension but crystals of 5 inches in diameter have been found. The pegmatite dike measures 36 to 52 feet in width and has been traced over a distance of 900 feet. In recent years, especially from 1940, a number of operators have studied the deposit in view of developing its radioactive and rare earth potentialities.

DENHOLM Township, Gatineau county.

Range B, lots 12, 18, 19.

Ref.: 3, p.119; 4, p.60; 5, p.49; 7, 1900, p.23; 11, 1892, p.87; 12, 1946, p.37; 12, 1947, p.43; 13, no.235, p.7 (F).

Mica was first discovered in range B around 1892; work was done intermittently on the deposits of lots 18 and 19 by various operators. The most recent operations were done by J.B. Gauthier who worked the deposit on lot 19 from 1946 to 1951 and sold a small quantity of mica to J.J. Kenney. The belt of mica bearing pyroxenite is 150 to 300 feet wide and traced for a length of 1800 feet.

Range I, lots 1, 49, 50, 51

Ref.: 3, p.137; 4, p.60; 12, 1944, p.37; 13, no.235, p.5; Canadian Mining Journal, 1946, p.716.

The Erickson Mine on lots 49 and 50 of range I was optioned by A.P. Bood in 1940; intermittent production was recorded from 1936 to 1944. The occurrence is similar to other phlogopite deposits of the Grenville subprovince. The showings on lots 1 and 51 have never been developed to the production stage.

Range V, lots 20, 21, 22

Range VI, lots 26, 27

Range VIII, lots 18, 19

Ref.: 3, p.137; 4, p.60; 5, p.49; 11, 1892, p.87.

These locations are mentioned as containing indications of phlogopite; they have not been developed.

DERRY Township, Papineau county.

Range I, lots 1, 5, 7, 9, 23

Ref.: 2, p.61; 3, p.62; 4, p.65; 5, p.48; 7, 1898, p.40;
7, 1900, p.21.

On these lots the Davis mines (lot 1) the Cameron Mine (lots 5 and 7), the Daisy Mines (lot 9) and the McTierny Mine (lot 23) were worked in the late 1800's and early 1900's by various operators. The more recent operations were by Charles Billings and Wm. L. Parker who worked the deposit on lot 5 around 1918 and 1926 respectively. The deposit on lot 9 was mined by J.N. Wallingford from 1942-44 and the output was sold to W.B. Cross. The phlogopite is generally dark coloured and included in pyroxenite; pyrite is quite abundant in some of the deposits.

Range II, lots 2, 3, 7, 23, 31

Ref.: 2, p.61; 3, p.63; 4, p.65; 5, p.48; 7, 1898, p.40;
7, 1900, p.22.

The deposits on lots 2 and 3 were at one time mined for phosphates; in 1900, phlogopite was mined by the Glen Almond Mica & Mining Co. W.A. Allan worked the deposit on lot 7 around 1907 during a period of 18 months, it was worked by Alban Gold Reefs Co. Ltd. around 1919. The mine on lot 23 has been idle since 1899 when the Glen Almond Mica & Mining Co. extracted several tons of phlogopite.

The most recent operations on lot 31 were by J.B. Gorman around 1928. The mica in all these mines in dark amber and associated with pink calcite in pyroxenite.

Range III, lots 3, 4, 6

Ref.: 2, p.62; 5, p.48; 7, 1900, p.22.

Work on these deposits was done around 1900 by the Glen Almond Mica & Mining Co. A small production of phlogopite was recorded in 1941 by Damase & Hormidas Clement from lot 4.

Range V, lot 1

Range VI, lot 9b

Ref.: 4, p.65 and 84.

The deposit on lot 1, range V, contains muscovite as well as phlogopite and both minerals were produced at one time. E.M. Lapointe was interested in this deposit in the years preceeding 1935. The deposit on lot 9b, range VI was prospected around 1920 by the Detroit Mica Mining Co. Ltd.

DE SALES Township, Charlevoix county.

Near Lacoste Township.

The Pied-des-Monts Mine in adjoining Lacoste township extends southwart into De Sales township. (See Lacoste township).

EARDLEY Township, Gatineau county.

Range IX, lots 1, 2, 3

Range X, lot 2

Ref.: 3, p.137; 4, p.59; 5, p.48; 7, 1899, p.33.

Mica showings are noted on these lots particularly on N½, lot 2, range X, which was prospected around 1900 by Charles Flynn.

Range XI, lots 3, 6.

Range XII, lot 6

Range XIII, lot 9

Ref.: 3, p.137; 4, p.59; 5, p.48; 7, 1899, p.33.

Other known occurrences. The N½ of lot 6 was worked around 1899 and a good quantity of mica was extracted. The property belonged to the gray sisters of Ottawa.

EGAN Township, Gatineau county

Range B, lot 46

Range I, lot 15

Ref.: 10, no.50, p.30.

Phlogopite occurrences are reported on these lots.

Range II, lot 28

Range III, lots 66, 75

Ref.: 3, p.129; 4, p.61; 10, no.23, p.53; 10, no.50, p.30.

The deposit on lot 28, range II, was worked around 1907 by H. Joanis. The phlogopite is clear and the crystals are often quite large. The other deposits in range III have been worked early in this century but there is no record of production.

Range IV, lot 51

Range V, lots 16, 61

On these lots can be seen old workings for which we have no record of production.

GRAND CALUMET Island, Pontiac county

Range VII, lot 6

Ref.: 10, no.18, p.28.

Pegmatite dikes containing muscovite have been observed on Calumet Island. The deposit on range VII, lot 6 was last worked around 1920 by W.D. Holmes who sold mica from the old dumps.

GRENVILLE Township, Argenteuil county.

Range IV, lot 8

Range V, lots 7, 10

Range VI, lots 8, 9, 10, 15

Ref.: 2, p.19; 3, p.200; 4, p.84; 5, p.58; 7, 1928, p.167; 9, 1936-C, p.35; 9, 1928, p.167; 11, 1892, p.88; 13, no. 467, p.9.

There is evidence of phlogopite mining on these lots and the records show that there was activity as early as 1892. The Parker Mine on lot 7, range V was operated around the turn of the century by the Grenville Mining Co. Several tons were extracted by Mr. Webster from lot 10, range V in 1892. The most recent operations on these lots were by Z.E. and H. Chenier who produced mica intermittently between 1936 and 1943 on lot 9, range VI; from this deposit, large mica sheets were extracted in 1853 to be shown at the Paris exposition of 1855.

Range VII, lots 6, 12, 16, 17

Range X, lots 1, 16, 20

Ref.: 2, p.19; 3, p.200; 4, p.84; 5, p.58; 9, 1936-C, p.35; 12, 1941,p.22; 12, 1942, p.31.

The openings on these lots were made around the turn of the century except on lot 16, range X, where the deposit was worked in 1941 and 1942 first by P.G. and J.F. McKenzie and by the St. Lawrence Mining Corporation. The deposit is the property of Canadian Refractories Ltd.

GRENVILLE Augmentation, Argenteuil county.

Range II, lots 2, 3, 4,

Range IV, lot 9

Range X, lot 5

Ref.: 8 (P.E. Bourret, 1942, 1954); 9, 1936-C, p.35.

The deposit on lot 3, range II, was worked from 1942 to 1944 by Leon Constantineau who reported a small production of phlogopite. We have no record of production from the pits on the other lots mentioned. Donald McCabe did some work around 1954 on the deposit in range X, lot 5.

HARRINGTON Township, Argenteuil county.

Range I, lot 18

Range II, lot 18

Range IV, lots 5, 8, 9

Range VIII, lot 18

Ref.: 4, p.84; 5, p.58; 9, 1936-C, p.35; 11, 1892, p.88; 12, 1945, p.37.

There is little information on the numerous pits dug in Harrington township, some have produced mica others were only for exploration. The Frazer mine, on lot 8 N½, range IV, was worked around 1892 and a small quantity of mica was produced. The Courte Mine in range VIII, lot 18, was active quite recently when Come Rousseau produced some mica in 1945 in association with Asbestos Crude and Fibre Mines Ltd. Production resumed from 1950 to 1961, when intermittent shipments were reported by Arundel Mica Company who had optioned the property from Rousseau.

HARVEY Township, Dubuc county.

Range V, lots 15, 16

Ref.: 8 (P.E. Bourret, 1939, 1951)

This mica deposit was first worked in 1939 by Dominique Santis for Roberval Mica Corporation Reg'd. Pegmatite dikes in anorthosite or gneiss have yielded some 30,000 pounds of muscovite of all sizes and grades; of this production, only about 2,000 pounds of finished mica was produced and sold for about 50¢ per pound. Large beryl crystals and some radioactive minerals are also found in these pegmatites.

HINKS Township, Gatineau county.

Range II, lots 7, 21, 22

Ref.: 1, p.17; 2, p.71; 3, p.119; 4, p.60; 5, p.49; 11, 1894, p.97; 11, 1897, p.282; 8 (P.E. Bourret, 1941); 13, no. 196, p.16.

The mica deposits in range II were nearly all known at the end of the last century. The Baumgarten deposit on lot 21 did not produce any mineral but mica of good quality is said to be present. The most important location in range II is on lot 22, where mica was discovered in 1894 by Clemow and Powell; the mine was active intermittently until 1900. In 1939, Ambermica of Canada Limited reopened the mine and a small production was recorded in 1940 and 1941 by the Lake St. Marie Mica Mines Ltd. The property has been idle since 1942.

The mica is dark coloured and sometimes the sheets are quite large attaining four feet in diameter; it occurs at the contact of pyroxenite and crystalline limestone.

Range III, lots 23, 25

Ref.: 3,pp. 119, 136; 4, p.60; 5,p.50; 11, 1897, p.282.

There are good indications of mica on lot 25 but the attention has been concentrated on lot 23. Mr. Emond worked this deposit first in 1906 and sold his rights to Messrs. Pritchard and Sparks. Their was no activity from 1909 until 1927 when Wm. J. Sparks reactivated the mine. Our records show that the latter sold mica from this deposit during the years from 1936 to 1942. The mica is very dark coloured and is associated with calcite and amphibole.

Range IV, lots 1, 2, 3, 6, 17, 18, 30, 31, 36, 37, 38

Ref.: 3, pp. 120, 136, 137; 4, p.60; 5, p.50; 7, 1898, p.37; 11, 1897, p.282; 13, no.196, p.16.

The Paquet mine on lots 2, 3, was opened in 1897 and worked in 1898 by Mr. Watters. More recent activity was recorded in 1938 when Arthur Emond produced some mica from this deposit. On lot no.6, Richer and Company did some work in 1898 but the mica was found too small to be of commercial value. The deposit on lot 31 was worked in 1905 by B. Emond and a small production was recorded, the mica is sometimes very clear in this deposit. The other lots mentioned are mostly all prospects which have not produced any mica.

Range V, lots 21, 22, 23, 35, 36, 37

Ref.: 3, p.137; 5, p.50.

These are mica prospects for which we have no record of production.

Range X, lots 32, 33

Range XI, lots 10, 11

Ref.: 3, p.137; 4, p.60; 5, p.50.

These lots were prospected at the turn of the century notably by T.J. Watters.

Range XII, lot 25

Range XIII, lot 13 W½, 48, 49

Range XIV, lot 47

Ref.: 3, p.137; 4, p.60; 5, p.50; 8 (P.E. Bourret, 1938).

From these lots, we have production reports by Andrew Pritchard in 1909 (lot 25, XII); by M.E. Sparks in 1943 (lot 13 W½, XIII) and by R.E. Spratt in 1938 (lot 47, XIV).

HUDDERSFIELD Township, Pontiac county.

Range IV, lot 22 N½

Range V, lots 21, 22

Ref.: 8 (P.E. Bourret, 1939, 1944)

Calumet Mica Co. operated the mine in range IV before 1923. Adams Martin leased the property and operated the mine until 1938. In 1939, Omer Bérard produced a small quantity of mica and in 1944, the Twin Valley Prospecting Syndicate reported a small production. The property was idle until 1960 when Bazel Reed and James Trudeau sold mica from the dumps to Walter Cross of Hull. This mica deposit was also prospected for fluorite, molybdenite and copper. The occurrences in range V have not been developed.

HUDON Township, Roberval county.

Range I, lot 14

Ref.: 8 (P.E. Bourret, 1940)

A pegmatite dike uncovered over a length of 250 feet and a width of 100 feet cuts through folded paragneiss. Large muscovite crystals measuring up to 2 feet in diameter were found in this deposit, they are often undulated and contain iron oxyde stains at least near the surface. The prospect was worked in 1939 by Louis Pelchat and Associates, it was acquired in 1940 by La Compagnie de Mica Mistassibi Ltée. It was not found possible to find a market for the product and the claims were abandoned around 1952.

Near the center of Hudon township, 1.5 miles north of Lac Noir

Ref.: 8 (P.E. Bourret, 1944); 12, 1943, p.55; 12, 1945, p.38; 12, 1946, p.37; 12, 1947, p.43; 13, no.404, p.11.

Joseph Delisle produced phlogopite from this deposit from 1943 to 1946. The deposit measures 600 feet in length and consists of crystalline limestones more or less altered to pyroxenite by metasomatism.

HULL Township, Gatineau and Hull counties

Range II, lots 7b, 10

Ref.: 8

Lot 7b was prospected by Gatineau Mining Co. before 1925; in 1926 the mining rights were acquired by J.A. Barrett and A. Champagne. Lot 10 was the property of the Laurentide Mica Co. Ltd. who did not report any production.

Range VI, lots 14, 15, 19, 20, 22

Ref.: 2, p.62; 3, p.107; 4, p.59; 5, p.34; 7, 1899, p.37; 7, 1900, p.20; 7, 1903, p.60; 7, 1904, p.36; 7, 1905, p.10; 12, 1945, p.38; 12, 1946, p.37.

The old Morris Mine on lot 14 was operated from 1903 to 1905 by the Kent Brothers of Kingston. In 1945, the property was acquired by the Pink Lake Mica Mines Ltd. who sold 2782 pounds of mica valued at $1169. in 1946.

Victor Trudeau operated a mine in 1940 on lot 15 and recorded a small production.

The Wallingford Mine on lot 19 was discovered around 1899 by Mr. Bogley and worked by Mr. Wallingford for a few years after 1906.

The Cliff mine on lot 20 N$\frac{1}{2}$ was operated from 1899 by the Brown Bros., the mine gave about 40 tons of good quality mica, it was operated only during about 10 months. Brown Bros. also prospected lot 22 in 1900.

Range VII, lots 15, 18, 19, 20

Ref.: 1, p.16; 2, p.63; 3, pp. 107-110; 4, p.59; 5, p.34; 7, 1899, p.31; 7, 1900, p.20; 7, 1902, p.17.

The deposit on lot 15 is known as the Headley mine, the last reported activity at this location was in 1927 when McCannell Consolidated Mines Ltd. sold some mica to W. Cross.

The Fortin and Gravelle mines on lot 18 N½ was opened in 1899 and worked intermittently until 1906. The mine was reactivated around 1922 by the Laurentide Mica Co. Ltd. but no mica was produced. There was a small production in 1951 and 1952 by J.H. Wallingford. The Eva Mine on lot 18 S½ was operated in 1899 and 1900 by the Brown Brothers. The Aberdeen Mine on lot 19 was worked in 1899 and 1900 by the Brown Brothers, in 1904 it was acquired by the Laurentide Mica Company who produced mica from several openings until about 1920.

The Fleury Mine on lot 20 S½ was operated by C. Brown in 1898 and by H. Fleury from 1900 to 1908. A crystal of 500 pounds measuring 24 x 28" was taken out of this deposit; the total production was about 20 tons.

Range VIII, lots 17, 18

Ref.: 3, p.110; 4, p.59.

The mine on lot 17 was the property of James Padden, it was operated for a short period in 1910 by Messrs. Winning and Church. In 1909, H. Flynn operated the mine on lot 18 for a short period.

Range IX, lots 7, 14, 15, 16, 17, 19.

Ref.: 1, p.16; 2, p.63; 3, p.110; 5, p.35; 7, 1902, p.16; 8.

The most recent operation on range IX, was on lot 7 where Oscar Poulin operated a mine in 1957, production continued from 1959 to 1962 when Leo Joanisse extracted mica from this deposit and sold the output to Blackburn Brothers.

The mine on lots 14 and 15 N½ was opened around 1892 by Michael Scott and was operated for phosphates in the early days. M.G. Robertson extracted a few tons of mica from the deposit in 1897.

The mine on lot 15 S½ is also an old phosphate mine opened around 1892 by John Sweeney. Around 1910 Kent Brothers of Kingston worked the mine for mica during a short period.

Mrs. J. O'Neil was owner of the mine on lot 16. Some work was done in 1903 but little mica was produced.

Lots 17 and 19 were mica prospects with good indications, the Wallingford Brothers worked the mine on lot 19 in 1902.

Range X, lots 4, 6, 7, 9-11, 13-17, 19, 23.

Ref.: 1, p.16; 2, p.65; 3, p.95, 111, 112; 4, p.58; 5, p.35, 36; 7, 1899, p.32; 7, 1900, p.21; 7, 1902, p.16.

Mica was produced on several lots in range X, most operations lasted only a short time and have been closed for a number of years some lots are only mentioned in the litterature.

Lot 6 was prospected in 1892 by G. Robertson. Lot 7, was the Foley or "Big Cristal Mica Mine" which was worked between 1892 and 1898 by various operators. Barite was also extracted from this mine until 1903.

Lot 10 was the Nellie and Blanche mine. Lot 11 was first worked in 1897 by C. Church, and in 1904 the Kent Brothers worked the deposit. The last operation took place in 1910 when Winning and Church Co. worked the deposit for a few months. Lot 13 had a deposit in the north half belonging to James Reynolds and another one in the south half belonging to M. May, very little work was done here.

Lot 14 was worked by Thos. Macowley around 1902 and by Narcisse Trudeau around 1914.

Some recent operations were recorded on lot 15 where Victory Mines produced mica in 1944. This deposit has been worked by H. Flynn around 1906 and was abandoned after the production of one thousand tons of mica.

The deposit on lot 16 called the Bradley Mine was opened in 1892 and operated by various person until 1908. The mica is clear and of good quality.

The mine on lot 19 N$\frac{1}{2}$ was worked in 1906 by Mr. Dunlop and around 1912 by R. McCannell. The mica is associated with phosphate and pink calcite.

The Mica Mining and Manufacturing Co. worked the deposit on lot 23 around 1900.

Range XI, lots 5-7, 9, 10, 12-14, 16, 17, 22, 23

Ref.: 1, p.21; 2, p.65; 3, pp. 96, 112; 4, p.59;; 5, p.37; 11, 1892, p.85; 11, 1894, p.97.

The Kearney mine on lots 5 and 6 S½ was worked around 1892 by Messrs. McRae and Allan. J. and P. Kearney had previously worked this mine for phosphats around 1882. W.C. Cross & Co. produced mica from this deposit from 1959 to 1962. Lot 5e was worked in 1891 by Messrs. Powell and Clemow and by various other operators until 1909; no work has been done since that time. Lot 6 N½ has been inactive since 1893 but at that time about 8 tons of mica were extracted by J.W. Perkins.

On lot 10 is the Nellie and Blanche Mine which was opened around 1880 for the production of phosphate, in 1882 J.T. Haycock extracted some mica from the mine. Considerable development took place between 1892 and 1897 when the Lake Girard Mica System took over the property and employed up to 50 men. Around 1936, the Blackburn Brothers acquired the Nellis Estate which comprised lots 9, 10 and 12. There is phosphate on these lots in addition to mica, no activity has been recorded in recent years.

Lots 13 and 14 are also old phosphate mines containing good crystals of phlogopite. There has not been any recent mining activity there. The deposit on lot 16 was opened around 1902 and was acquired in 1907 by the Laurentide Mica Company who operated the mine almost continuously for 5 or 6 years. Phosphate, mica and pink calcite are the main constituants in joints and fissures within pyroxenite.

Another deposit on lot 16 was operated by J.H. Connor around 1902 and by Messrs. Fortin and Gravelle the following year. In 1910 some work was done on this deposit by O'Brien and Fowler. Here also, the mica is associated with phosphate.

Some work was done on lot 17 by Mr. Brown of Cantley around 1897; some years later J. Flynn extracted a few hundred tons of mica. The last operations were in 1908 by W. Charleson of Ottawa.

There was activity on lots 22 and 23 around 1894. The mine on lot 23 was known as the Moore or Wright Mine.

Range XII, lots 1, 4, 7, 10-16, 21

Ref.: 1, p.15; 2, p.65; 3, p.97; 4,p.58; 5, p.38; 7, 1898, p.31; 7, 1899, p.32; 7, 1903, p.59; 7, 1936, p.39; 7, 1937, p.42; 7, 1938, p.43; 7, 1939, p.36; 7, 1940, p.24; 12, 1944, p.36; 12, 1945, p.37; 12, 1946, p.37; 12, 1947, p.43.

The Burke Mine on lot 1 S½ was opened in 1882 for phosphate. Mica was later extracted by various operators until 1894. No work was done on this property until 1942 when the Linmac Mica Ltd. reported a small production in 1942 and 1943. In 1961 and 1963, sales of mica from this deposit were reported by Waldish Duquette.

Indications of mica are reported on lots 4 and 7, the latter contains muscovite in pegmatite dikes.

The Vasavour mine on lots 10 is one of the most important mica mines in Quebec. It had a long history starting around 1878 when Donald Gow of Cantley worked the mine for phosphate during about 6 years. The mine was later worked for mica by the Vasavour Mining Association and by George and Charles Wallingford. The mine was part of the Nellis Estate acquired in 1936 by Blackburn Brothers who operated it continuously until 1948. From then on, work was concentrated on the dumps to recover waste mica for grinding. There are four main veins on the property which have about the same characteristics as the other phlogopite deposits of the area being in pyroxenites associated with pink calcite and apatite.

The mine on lot 11 a was called the Lucky Reserve, it is situated only a few hundred yards northwest of the Vasavour Mine; it was operated from 1906 by the Brown Bros. and was part of the operations of Blackburn Brothers from 1940 to 1943.

Lot 12b was the property of J.J. Egan until 1950 when it was acquired by Blackburn Bros. There was production in 1948 and 1949 by the Cantley Mining Co.; little work was done after that.

Lot 13 was the property of Mr. Hibbard who produced a small quantity of mica before 1912. Lots 14, 15 and 16 have many openings which were made to discover either phosphate or mica. The first work dates back to the 1880's and from that time until 1910 much work was done by various operators in search of good quality mica; the mica occurrences are of small size. These lots were part of the Nellis Estate acquired the Blackburn Bros. in 1936.

The Cascades Mine on lot 21 was operated by A.G. Martin who reported a small production from 1936 to 1939.

Range XIII, lots 1, 3, 4, 9, 11-13, 15

Ref.: 1, p.16; 2, p.66; 3, p.99; 4, p.58; 5, p.39.

Lot 1 contained the Burke Mine which was operated for phosphate as well as mica between the years 1890 and 1905.

On lot 3 is an old phosphate mine operated by John Thibert of Cantley before 1905. American Mica and Phosphate took an interest in the property in the 1930's. Amber mica is associated with the phosphate and calcite in joints of the pyroxene rock.

Lot 4 S½. This mine has produced about 10 tons of mica and some phosphate between 1887 and 1910. The last operator was C. Brown.

Lot 9. Ernest Poulin and Thos. Holmes did some work on this property in the 1930's.

Lot 11, was worked around 1897 by Dr. Graham of Hull who reported a small production. Brown Brothers were interested in this property in the 1930's.

Lot 12 was operated by H. Flynn in 1908 and by B. Fleming in 1910. Lot 12a and 13a, Webster and Co. opened this phosphate mine in the early 90's, it lay idle until 1910 when Winning Church & Co. took over the property and worked it for a few years producing mica. This property was part of the Nellis Estate acquired by Blackburn Bros. in 1936. The mica is of good quality and size.

Range XIV, lots 10, 15-17, 22

Ref.: 1, p.16; 3, pp. 101, 114; 4, p.58; 5, p.39.

The McClelland Mine on lot 10 N½ was first worked for phosphate around 1887. Mica was produced at various times and by various companies until the early thirties. The Gatineau Valley Mica Co. was the last operator but we have no record of production by this company.

The mine on lot 15 was operated by D. and T. Ramsay in 1907. More recently, Edgar Gagné reported production from 1960 to 1964. On lot 22, John Bate started work in 1899 and the mine was idle until 1908 when Mr. Wilson of Cascades reported a small production. The mica is dark amber and occurs in a gray pyroxenite.

Range XV, lots 11-13, 15-17, 22-25, 27.

Ref.: 1, p.21; 2, p.66; 3, pp. 112, 115; 4, p.58; 5, p.39; 7, 1898, p.31; 7, 1899, p.32; 7, 1900, p.21; 7, 1901, p.23; 7, 1936, p.40; 7, 1937, p.42.

On lot 11 was the Daisy Mine operated around 1898. The Dacey Mine was on lot 12a. It was opened around 1890 by Messrs. Chubbock and Rainford and was active until 1904 under the direction of Webster and Co. It was then sold to General Electric Co. who did not operate the mine. In 1918, Calumet Mica Co. were the owners and A.G. Martin was granted a lease on the property, the latter operated the mine until 1936. More recently, Perkins Mills Mica Co. Ltd. produced mica in 1945-46 and Eugene Renaud from 1951 to 1958. The mine contains phosphats in addition to amber mica.

The McAllister Mine on lot 12b has been worked on a large scale in the early years of this century until 1914 when both mica and phosphate were extracted. In recent years, the McLaurin Mica Ltd. produced a small quantity of mica in 1945 and Victor Trudeau sold mica from this deposit in 1959-60.

The Connor Mine on lot 13 was last worked in 1910 by O'Brien and Fowler; it was opened around 1897 and was operated at various time by various people including Messrs Chubbock and Rainford.

The Jamieson mine on lot 15 E½ was not operated in this century but the 75 foot pit attests to important activity in the past.

The Cassidy Mine on lot 15 SW¼ has been active from 1892 to 1901 notably by the Cascades Mica Co. and by Development Mica Mining Co. Large crystals of mica were extracted from this deposit.

On lot 16, two mines were operated, one by Mr. Mottard in the south half and one by Mr. McFarlane in the N½. There has not been any activity there in this century except in 1940 when a small production was reported by H.S. Cross.

The mine on lot 22 was opened around 1899 by John Bate who operated only a few months. In 1908 the mine was reopened by Mr. Wilson of Cascades but the operation was also short lives. The mica is dark amber and many crystals are crushed.

The Cascades Mine was on lot 23, it was opened around 1892 by Mr. H. Flynn and operated intermittently by various people until 1910. A small production was reported in 1947 and 1958 by Low and Co. A mica crystal measuring 5 x 7 feet was extracted from this mine giving 6,300 pounds of hand trimmed mica.

The Moore Mine was on lots 20 and 25; it was first worked in 1890 by W. Powell. The last recorded operation was in 1907-08 when Mr. Keller worked the dumps for mica. During its recorded history, the mine was very active under various operators.

Mr. H. Flynn opened a mine on lot 27 in 1905 and worked it intermittently until 1910.

Range XVI, lots 11-13, 15, 16, 23, 26-28

Ref.: 1, p.17; 2, p.68; 3, p.103; 4, p.58; 5, p.41; 7, 1898, p.32;

The McLellan Mine on lot 11 was worked intermittently between 1892 and 1899. The Moore Mine on lot 12 was worked for phosphate in 1892 and a small quantity of mica was recovered. Some serpentine is associated with the pyroxene at the limestone contacts.

The Wilson Mine on lot 13 was opened by J.A. Wilson in 1892 and worked mainly for phosphates, mica being recovered as a by-product. There was little production after 1914.

The Horseshoe Mine on lots 15 N½, 16 N½ and 17 was worked around 1892 for phosphate. The Lake Girard Mica Company acquired the property in 1891 and did considerable work. Around 1909, the Kent Brothers Company recovered mica as well as phosphate from the deposit. More recently, William Trudeau produced mica from 1935 to 1939 and sold the output to W.C. Cross of Hull. The mica crystals are often very large, they are generally friable and dark coloured.

In the south halves of lots 15 and 16 a mica mine called Cassidy was worked as early as 1893 by the Cascades Mining Co. This mine lay idle from 1901 until 1937 when Jos and Mathew Morris produced mica, from then until 1952 the mine had several active intervals under Adelard Poirier, Charles Osler and Henri Poirier.

The eastern lots 26, 27 and 28 were the property of H. Robertson and Osborn Carman. The last operations were on lot 27 where a small production was recorded in 1940.

JOLIETTE Township, Joliette county.

Range I, lot 2

Ref.: 9, 1936-A, p.40; 9, 1937-A, p.42.

François Bazinet produced light amber mica from this deposit in 1936-37.

JONQUIERE Township, Jonquiere county

Range North, lot 21

Ref.: 11, 1885, p.116; 14, p.141.

Mica was found around 1885 on this lot.

Range III, Anse-à-Caron

Ref.: 3, p.195.

This occurrence of dark mica in large crystals was reported by J. Laflamme in 1882.

Range VI, lots 16, 17

Ref.: 8, 1921.

Muscovite was discovered on these lots around 1921.

Range VII, lot 18

Ref.: 8, 1940.

Crushed mica was sold in 1940 by J.F. Gauthier to Mouture Nationale Ltée.

KENSINGTON Township, Gatineau county.

Range I, lots 44, 45

Range II, lot 53

Range VI, lots 3, 16

Ref.: 10, no.50, pp. 29-30.

Most of these occurrences reported by Aubert de la Rue contain phlogopite and their is evidence that small scale mining was done in the past; the mica is generally highly distorted. On lot 53, range II, a pegmatite dyke was discovered in 1943 by A. Guilbault it contains muscovite crystals up to 5 inches in diameter.

KILDARE Township, Joliette county.

Range VII, lot 12

Ref.: 16, 1895, p.150 J.

Showings of mica reported.

LACORNE Township, Abitibi East county

Range VIII, lots 16, 22

Samples of muscovite with sheets up to 5 inches in diameter have been received from these locations.

LACOSTE Township, Charlevoix county

Near Lake Pied-des-Monts

Ref.: 4, p.84; 7, 1903, p.65; 7, 1906, p.43; 8 (P.E. Bourret, 1936, 1937, 1938, 1941); 11, 1894; 12, p.22, 1941.

This deposit was opened in 1893 by the Canadian Co. From 1905 to 1908, the Canadian General Mining Company did some underground work but apparently did not find commercial muscovite in economic quantities. Around 1936, the Charlevoix Radium and General Mining Co. Ltd. did some work to clean up the old trenches and find the source of the good quality mica lying on the dumps. All this work did not result in the discovery of a mica deposit of economic value.

LA MINERVE Township, Labelle county.

Range XI, lots 54, 57

Ref.: 13, no.441, p.10.

Muscovite was found in two places in the N.W. part of the township near the north shore of Lac Delabre. The mica occurs in joints within crystalline limestone; the crystals are not more than two inches in diameter and represent less than 5 per cent of the outcrop.

LANDRY Township, Abitibi East county.

Half mile west of the Bazin River

Ref.: 9, 1936-B, p.32.

Biotite crystals up to four inches in diameter were found within pegmatites cutting crystalline limestone.

LITCHFIELD Township, Pontiac county.

Range IX, lots 18, 22, 23, 26

Ref.: 3, p.134; 4, p.67; 5, p.58; 7, 1898, p.41.

These are merely mica prospects which have known some activity in the late 19th century. The deposit on lot 26 belonging to Bowling Bros. was worked until 1903, it contains dark brittle mica associated with pink calcite and brown phosphate, about 3 tons of mica were mined from this deposit.

Range XI, lots 20 and 22-B

Ref.: 5, p.58; 7, 1898, p.41; 8 (P.E. Bourret, 1960).

The prospect on lot 20 has not been worked in this century. On lot 22-B, Romain Dagenais did some work in 1960 and uncovered crystals of phlogopite, brittle and dark, measuring not more than 6 inches in diameter; no production was recorded.

LOCHABER Township, Papineau county.

Range VIII, lot 19

Ref.: 4, p.64.

Mica prospect worked by Detroit Mica Co. Ltd. around 1920. J.B. Gorman was a subsequent owner but did little work on the property which lay idle since 1925.

LOW Township, Gatineau county

Range A, lots 29-31

Ref.: 8

Charles Morlot produced mica from lots 29 and 31 from 1935 to 1941. On lot 30 W½ Bruce Robson and the Active Exploration Prospecting Syndicate did some work in 1948 and 1949, no production was recorded.

Range III, lots 24, 25

Range VII, lots 17-22

Range XII, lot 36

Range XIII, lot 36

Ref.: 1, p.17; 3, p.137; 4, p.60; 5, p.49; 11, 1892, p.87.

Active prospection and a small production came from some of these lots in the nineties. Large crystals of clear mica came from the Brock Mine in range XII, lot 36 and from Venosta Mine range XIII, lot 36.

LUSIGNAN Township, Joliette county

On Mattawin River Road near latitude 46°45'

Ref.: 13, no.541, p.12 (F)

Phlogopite crystals up to 4 inches in diameter are found in a fine grained calcareous rock. This rock contains more than 50% phlogopite in some parts.

LYTTON Township, Gatineau county

Range II, lots 21 and 40

Ref.: 3, p.138; 4, p.61; 5, p.55; 7, 1900, p.22; 10, no.23, p.53.

A.Ethier worked the deposit on lot 21 in 1898 and 1899 and Moore and Webster worked it in 1900, a good quantity of mica was extracted at that time. Other extensive workings are seen on lot 40, range II.

Range III, lot 55

Range IV, lots 5, 22, 55

Range V, lots 9, 53

Ref.: 10, no.23, p.53.

Important workings for mica are reported on these lots.

MANIWAKI Township, Gatineau county.

Range II, lot 20

Ref.: 4, p.61; 17, no.136, p.134.

Three excavations were made for mica. The country rock is limestone intruded by pyroxenite. The crystals of mica are now seen in one pit only, their maximum diameter is 3 inches.

Range III, lot 14

Ref.: 4, p.61; 5, p.54; 7, 1898, p.40; 7, 1899, p.37; 17, no. 136, p.135.

H. Flynn produced about 10 tons of mica from this lot in 1898; the following year the deposit was worked by Mathias Joanis who produced a few hundred pounds. The mica is dark amber and the crystals are generally small.

Range III, lot 21

Ref.: 4, p.61; 17, no.136, p.135.

Dark amber mica was mined on a small scale from two pits on this lot. As elsewhere, the mica is associated with pyroxene and calcite; the crystals attain 6 inches in diameter.

MANSFIELD Township, Pontiac county.

Range V, lots 19, 20.

Ref.: 4, p.67.

D. Callaghan mined a small quantity of mica from these lots in the twenties.

MASHAM Township, Gatineau county.

Range I, lot 34

Range III, lots 10, 11, 17

Range IV, lot 1

Ref.: 3, pp.117, 137; 4, p.59; 5, p.49; 7, 1898, p.40; 11, 1892, p.87.

Lot 34, range I was prospected for mica by T.J. Walters in 1898.

Several tons of mica were extracted from lots 10, 11, range III, in 1892.

Lot 17, range III was first worked by F. Biron in 1892; H. Flynn had 6 men working on the property in 1907. The mica occurs in pyroxenite without the usual association of calcite and phosphate. On lot 1, range IV, there are more indications of mica.

MONTAUBAN Township, Portneuf county

Range I, lots 37-46

Ref.: 12, 1950, p.40

Anacon Lead Mines sold a small quantity of powdered mica which was recovered as a by-product of the lead and zinc ore at the Tetreault Mine.

MONTIGNY Township, Labelle county

Range IV, lot 63

Muscovite occurrence in pegmatites. The crystals have a maximum diameter of 1.5 inches and the books are no more than 2 inches thick; they constitute 5 per cent of the rock.

NANTEL Township, Labelle county

Range V, lot 10

Crystals of muscovite were found on a small outcrop of quartzite. The books are one half inch thick and the maximum diameter of the sheets is 3 inches. There is much iron staining at the surface.

NORTHFIELD Township, Gatineau county

Range I, lot 6

Ref.: 3, p.121; 4, p.61.

A small production of dark amber mica came from this lot prior to 1912, the property belonged to H. Ellard.

Range II, lots 25, 32, 33

Ref.: 3, p.136; 4, p.61; 5, p.51; 7, 1899, p.37.

A small quantity of dark amber mica was extracted from these lots in the 1890's. Lot 25 was worked by C.B. Reed.

Range III, lots 31, 32, 34, 36

Ref.: 3, p.121, 136; 4, p.61; 5, p.52; 7, 1898, p.38; 10, no. 67, p.24.

Most of the mica mined on these lots came from lots 31 and 32 mined by J. Moriot in 1898 and V. Clément in 1910 respectively. The mica is dark amber.

Range A, lots 1, 2, 3, 8

Ref.: 1, p.18; 3, pp.122, 136; 4, p.61; 5, p.51; 7, 1898, p.37.

The deposits on lots 1, 2, 3 were opened in 1895 by F. Desjardins and later worked by the Toronto Mica Manufacturing Co. until 1898. The last operations was by Mr. Chabot of Ottawa in 1908. The mica is badly stained in these deposits.

On lot 8, Mr. E. Hamil has mined a few tons of mica.

Range B, lots 12, 13, 19, 20, 21

Ref.: 1, p.18; 3, pp.132, 136; 6, p.61; 5, p.51; 7, 1898, p.38.

The deposits on lots 12 and 13 were first prospected in 1891 and around 1908 by Richard More. A small production was recorded.

Dr. Synek of Gracefield and Mr. Labelle of Hull worked the deposit on lot 19 from 1898 to 1905.

Mica showings are also found on lots 20 and 21.

ONSLOW Township, Pontiac county

Range VII, lots 17, 22

Ref.: 3, p.135; 4, p.67; 5, p.57; 11, 1892, p.88; 13, no.293, p.6

This mine was discovered around 1892 but small scale production started only around 1900. Mr. Chubbock of Ottawa extracted a few tons in 1906. The showings on lot 22 were also known around 1892 and the Calumet Mica Co. did some work there around 1923; no production was recorded.

Range VIII, lots 22, 24

Ref.: 8

Henry Whalen produced some scrap mica from these lots in 1963-64.

PETAIN Township, Abitibi-East county

Ref.: 12, 1944, p.37.

Frank Sigouin mined a small quantity of high grade knife-trimmed ruby mica from a deposit in Pétain township in 1944.

PONTBRIAND Township, Dubuc county

Block A, near Headwaters of Peribonca River

Ref.: 3, p.195; 5, p.24.

Samples were taken out from this prospect around 1890 by Mr. Charlebois who described the occurrence as very big. The muscovite is abundant and of good quality according to reports.

PONTGRAVE Township, Saguenay county

N.E. corner of township near Cossette River

Ref.: 8 (P.E. Bourret, 1943)

This deposit was discovered in 1943 by Eugène Simard. It contains muscovite in large crystals of good quality but many specimens contain biotite inclusions.

PORTLAND E. Township, Papineau county

Range I, lots 1, 2, 4, 6, 7

Ref.: 1, pp. 14-22; 2, p.61; 3, p.60; 4, p.65; 5, p.47; 7, 1900, p.22; 11, 1892, p.87; 11, 1894, p.97; 8 (O.D. Maurice, 1966)

The deposit on lot 1 E½ was prospected in 1893 by J.W. Poupore and again in 1900 for a few months. Several tons of amber mica were extracted. On the W½ of lots 1 and 2, F.S. Shirley worked a phosphate mine around 1900. From that year until 1902, the Glen Almond Mica and Mining Co. did much development work and sold an important quantity of mica.

On lot 4, Venard Bigelow discovered a mica deposit in 1966 but very little workwas done on it. On lots 6 and 7 was the Little Rapids Mine which was worked for phosphate and mica around 1892.

Range III, lots 1, 2

Ref.: 3, p.61; 4, p.65.

In 1887, the France Mining Co. worked this deposit for phosphate. Around 1910, O'Brien and Fowler did considerable development work on this property and large crystals of mica of good quality were extracted; one measured 24" x 18".

Range V, lot 7

Ref.: 4, p.65.

This deposit was discovered in the early 1900's and was worked before 1920 by Detroit Mica Mining Co. Ltd.

Range VI, lot 7

Ref.: 4, p.84.

A little mining for muscovite was conducted on this lot in the early part of this century.

Range VIII, lot 18

Ref.: 4, p.65.

This mine was successively the property of O'Brien & Fowler, Rodrigue Hart and N.B. Davis. In 1941, Robert Bigelow rented the mine from N.B. Davis and produced a small quantity of mica. The mine was called the North Star.

Range VIII, lots 16, 17

Ref.: 3, p.62; 4, p.65.

The Lac Tamo Mine situated on these lots produced both phosphate and mica in the early 1900's. In 1910 it was worked by O'Brien & Fowler.

Range IX, lots 4, 9, 30-32

Ref.: 3, p.62; 4, p.65.

Little is known about the deposit on lot 4. Lot 9 was worked by O'Brien and Fowler around 1910 and was later acquired by Blackburn Bros. Lots 30-32 comprise the Little Chute Mine which has more than 18 openings and which was opened in 1915 by O'Brien & Fowler. Spar Hill Mining Co. produced mica from this deposit in 1939 and D.B. McLean reported a small production in 1940-41. The property was acquired in 1945 by J.W. Glover who worked it for two years and sold it to Hincks and White Fish Prospecting Syndicates.

Range X, lot 27 N½

Ref.: 8

The Banca Mining & Exploration Ltd. did some work on this property in 1943.

Range XI, lots 9, 10

Ref.: 8

This property belonged to Blackburn Bros. No development work is reported.

PORTLAND W. Township, Papineau county

Range I, lots 31, 32

Ref.: 3, p.104.

This property was worked for a short time in 1910 by Mr. Charron on behalf of J. Prud'homme the owner.

Range II, lots 6, 10, 13, 14, 16, 18, 20, 21, 23

Ref.: 3, p.199; 4, p.65; 5, p.45; 11, 1893, p.105.

Most of these locations are phlogopite prospects worked around the turn of the century and not later than 1920. Muscovite showings were discovered on lots 20 and 21 but the mica sheets were highly stained.

Range III, lots 12-16, 24-29

Ref.: 1, p.21; 2, p.59; 2, p.105; 4, p.65; 5, p.46; 7, 1899, p.34; 7, 1900, p.22; 8 (P.E. Bourret, 1943); 11, 1892, p.87; 12, 1945, p.38.

There was much activity in range III from 1892 to recent times (1964).

The deposit on lots 12 and 13 is known as Lake Terror Mine which was first operated in 1892 by the Lake Terror Mining Co.; the mine lay idle from 1894 to 1942 when Sylvanite Gold Mines produced mica for a few months; production resumed in 1945 and 1946 by Perkins Mills Mica Co. Ltd.

The Chabot Mine on lots 14, 15 was opened in 1899 by J.A. Chabot Co.; it was worked for about 5 years and was sold to Progressive Mining Company Ltd. around 1912. Watts & Noble Co. did some work on the property in the 1920's.

On lot 24 was the Lila Mine first worked for phosphate in the seventies by John Doller and sold to the Lila Mica Mining Co. in 1898, this company did considerable work and produced mica intermittently until 1907.

Gaudias Désormeaux produced mica from lots 25-28 in 1961 and 1964 and on lot 29, E. & F. Méthé produced mica in 1939-40, the output being sold to Mica of Canada Ltd.

Range IV, lots 15-18, 26-28, 32

Ref.: 1, p.22; 2, p.60; 3, p.106; 4, p.65; 5, p.46; 8 (P.E. Bourret, 1963); 11, 1893, p.105; 11, 1894, p.97.

The eastern lots (15-18) contain many indications of mica but only on lot 15 was there activity worth noting, this was the property of Mud Lake Mine who prospected the lot in the 1920's.

Lots 26 to 28 contained the old phosphate mine of Fleming and Allan which was worked for mica from 1891 by H. McRae. The mine was active intermittently until 1964; the last operator was Edgar Lavigne who produced mica from 1956 to 1964 from lot 28.

There was also a small production from lot 32 in 1940 by Tarrad & Trépanier.

Range V, lots 24, 25

Ref.: 2, p.60; 3, p.106; 5, p.46.

The Lake Girard Mica System worked these lots in the early 1900's. The property was later acquired by Micaspar Industries Ltd. who did some work in the early 40's.

Range VI, lots 4, 21

Ref.: 4, p.65; 18, p.77.

Gauthier and Guilbault worked lot 4 in the 1920's and O'Brien and Fowler worked the deposit on lot 21 for feldspar and muscovite, from 1911. The latter deposit was prospected at various intervals until 1948, the last interested company was Mica Spar Industries Ltd.

Range VII, lots 3, 4

Ref.: 8

There was production of mica from these lots in 1937 and 1942 by Bush Winning & V. Cameron.

Range VIII, lot7

Ref.: 8

Commercial Minerals Products Co. Ltd. produced mica from this lot in 1942.

Range IX, lots 5, 6

Ref.: 1, p.22; 2, p.60; 3, p.107; 4, p.65; 5, p.46; 7, 1899, p.35; 7, 1900, p.22; 7, 1939, p.37; 11, 1892, p.87.

On these lots was the old phosphate mine worked by the Canadian Phosphate Company; it was operated for mica between 1892 and 1900 by W. McIntosh and Angus Cameron. J.B. Gauthier and Ernest Guilbault did some work on the property from 1936 to 1940. D.V. McLean took over the property in 1940 and produced mica in 1940-41. There was more production from 1954 to 1961 first by Cameron and Sons then by R.A. Nadon.

Range X, lots 1-8, 11, 12, 15, 16, 23.

Ref.: 2, p.60; 3, p.107; 4, p.65; 5, p.47; 7, 1903, p.60; 8 (A.O. Dufresne, 1917); 11, 1892, p.87.

These lots contain mica showings which have been little developed. Canadian Amber Mica Co. was interested in lot 2 in the 1930's; John Burns prospected on lots 4, 5, 6 around 1920; Gauthier and Guilbault did some work on lot 7, around 1925; Peter Cameron and R. Malone produced a small quantity of mica from lots 11 and 12 in 1939 and T.G. McLaurin worked a deposit on lots 15 and 16 in the 1930's. Lot 23 had three prospects one of which was Central Lake Prospect worked by O'Brien & Fowler in 1917.

Range XI, lot 12

Ref.: 8

A mica deposit on this lot was worked by John Stewart around 1918.

RAWDON Township, Montcalm county

Range VII, lot 19

Ref.: 8

A prospect of muscovite was worked by C. McManiman around 1935 on this lot.

REMIGNY Township, Rouyn-Noranda county

Range VII, lot 47

Range VIII, lots 46, 47

Ref.: 8 (M. Lafontaine, 1942)

Muscovite showings were discovered on these lots but very little development work was done. The mica is brittle and difficult to split.

RINFRET Township, Abitibi-East county

Ref.: 12, 1947, p.43 (F)

Fleury Mica Mines worked a muscovite deposit in this township from 1946 to 1949; no production was recorded.

RIPON Township, Papineau county

Range VIII, lots 13, 14

Ref.: 3, p.138; 4, p.65; 5, p.55; 7, 1899, p.36.

This deposit was worked in 1899 by J. Joubert & Co. The amber mica is of good quality but of small size.

ROBERTSON Township, Labelle county

Range IV, lot 25

Ref.: 4, p.84; 10, no.50, p.29.

Muscovite occurs with tourmaline in a large pegmatite dike, it was mined in a small way around 1917. The sheets are two to four inches in diameter.

Range V, lot 25

Ref.: 8 (P.E. Bourret, 1935)

A muscovite occurrence similar to the preceeding but containing smaller crystals was worked in 1935 by J.H. Lamarche and Phrase Arbic.

Range X, lots 27, 28

Ref.: 10, no.23, p.53.

Some amber mica was produced in 1939 on lot 27.

Range XI, lots 27, 29

Ref.: 8 (P.E. Bourret, 1961)

Mont Laurier Mica Reg'd. produced mica from the eastern part of these lots in 1961 and 1963.

SAGAR Township, Charlevoix county

Range III, lots 11, 28

Ref.: 13, no.244, p.6 (F)

Muscovite crystals 4 inches in diameter are common in the pegmatites on these lots; they are frequently associated closely with biotite.

SAGUENAY Township, Charlevoix county.

Eightth Lake Ninth Lake

Ref.: 3, p.195; 5, p.23; 7, 1903,p.62.

On the shore of Rivière aux Canards, several pegmatite dikes carry muscovite generally in small crystals.

SHAWINIGAN Township, St. Maurice, county

Range II, lots 19, 20

Ref.: 8 (P.E. Bourret, 1945); 12, 1947, p.43.

Pegmatite lenses cutting quartzites and garnet gneiss were worked from 1945 to 1947 by Shawinigan Mica Ltd. The muscovite constitutes about 20 per cent of the mineralized part of the deposit, the sheets are of good quality but generally small.

Range III, lots 38-41

Range VII, lots 22-24

Ref.: 8 (P.E. Bourret, 1947)

Muscovite crystals in pegmatites were found in these lots and some development work was done near the showings in range VII, by Eugène Laroche from 1947 to 1949.

SUREAU Township, Pontiac county

N.E. arm of Lac aux Bouleaux

Ref.: 10, no.44, p.33.

Pegmatites containing muscovite in sheets up to three inches in diameter have been observed at this location.

SUZOR Township, Laviolette county

Ref.: U.N. of Toronto Studies; Geol. Series no.42, pp. 47-52, 1939;
8 (A. Deland, 1963; O.D. Maurice, 1967)

This deposit of phlogopite rich rock called suzorite was discovered in 1930 by Carl Faessler, a geologist employed by the Quebec Department of Mines. Siscoe Metals Ltd. worked the deposits in 1937 and in 1946. Suzorite Company Ltd. sold about 750,000 pounds of the fine grained mica from deposits adjacent to those of Siscoe Metals. The latter company and its subsidiary Vermiculite Company continued exploration until 1951 and 4,221 feet of diamond drilling were completed. From 1960, the Laviolette Mining and Metallurgical Corp. developed a deposit southeast of the Siscoe property, and did some diamond drilling in 1964, 1965, 1966.

The mica deposit contain from 60 to 90 per cent phlogopite having an average diameter of 0.5 inches; the reserves are of the order of several million tons.

TACHE Township, Lac St. Jean county

Range V, lots 13, 14

Ref.: 8

La Mine Nationale de Mica Ltée did some work on a mica deposit in the 1920's. No production was recorded.

TEMPLETON Township, Papineau county

Range IV, lots 1, 21, 22

Ref.: 1, p.19; 2, p.55; 3, pp. 67, 86; 4, p.64; 5, p.26; 7, 1898, p.33

Outcrops of mica were noted on lots 1 and 21; on lot 22 was the McVeity Mine first worked for phosphate. Messrs. Taylor and McVeity produced a few hundred pounds of phlogopite in 1898.

Range V, lots 18, 20

Ref.: 1, p.19; 2, p.55; 3, p.87; 4, p.64; 5, p.26; 7, 1898, p.33.

These lots were worked in 1896 by Mr. Smith of Gatineau Point who sold a small quantity of mica.

Range VI, lots 4, 14, 15, 17, 18, 21, 22

Ref.: 2, p.55; 3, pp. 67, 68; 4, p.64; 7, 1901, p.34.

On lot 4, Hormidas Lepine produced a small quantity of mica in 1935 and sold the output to W.C. Cross.

James Brady worked a deposit on lot 14 in 1901 but his main deposit was on lot 15 from which he produced mica and phosphate.

On lots 17 and 21 were the properties of Canadian Industrial Company which were worked mainly for phosphate but which contain good mica indications. On lot 18 S½, J. Cobey sold 18 barrels of light amber mica in 1905 and in the north half of the lot Mr. Perkins produced some mica in 1904.

George W. McElroy of Gatineau Point worked the deposit on lot 22 from 1906 to 1919. Very large crystals of reddish amber mica were extracted from this mine; red phosphate is also present.

Range VII, lots 10, 14, 17, 19

Ref.: 1, p.20; 2, p.56; 3, p.87; 4, p.64; 5, pp. 26-29

The Stevenson Mine on lot 10 was worked by several operators at the turn of the century.

The American Mica Co. of Boston prospected lot 14 in 1893-1894 it was called the Hutchiss Mine.

Lot 17 was the property of the Wallingford Brothers, little activity was reported from this lot but there are good indications of mica.

Lot 19 was worked in the 1920's by the Laurentide Mica Co. Ltd. it was originally prospected in 1899 by Jurkowski and Company.

Range VIII, lots 10, 13-17, 19

Ref.: 1, p.20; 2, pp. 50, 56; 3, p.87; 4, p.64; 5, pp. 20-29; 7, 1898, p.33; 7, 1899, p.30; 7, 1900, p.20; 7, 1903, p.58; 7, 1905, p.10; 11, 1892, p.86; 11, 1894, p.96; 11, 1895, p.60; 12, 1940, p.24; 12, 1941, p.21; 12, 1943, p.55; 12, 1944, p.37; 12, 1947, p.43; (some references mention these mines in range VII).

The Barbutte Mine on lot 10 was worked from 1895. Messrs. Wallingford of Belcourt produced several tons of mica around that time.

Mr. T. Dwyer of Perkins Mills produced mica from lot 13 in 1907.

The early reports (1894) mention mica showings on lot 14.

The deposits on lot 15 have been known recently as the Wallingford Mine owned and operated by Edouard Wallingford from 1936 to 1964. Mica was extracted from many openings on this lot from the year 1891 and phosphate had been produced for many years before that. On the east part of the lot was the Rainville or Dugas Mine belonging to Judge C.A. Dugas in the early days. The Phosphate King Mine was on the west part of the lot and was operated from 1895 by the Lake Girard Mica System and by various other operators for both phosphate and mica.

The Wallingford Brothers worked also on lot 16 begining around 1891; this mine had been opened in 1882 by C.H. Beacon. There are records of production from this mine until 1947.

Lot 17 also owned by the Wallingford Brothers has good indications of mica but the deposits were not extensively worked.

Lot 19 was prospected in 1899 by Jurkowski and Company.

Range IX, lots 4, 7, 10, 11, 13-18, 20, 21

Ref.: 1, p.20; 2, p.57; 3, p.71; 87; 4, p.64; 5, p.29; 7, 1899, p.31; 7, 1900, p.19; 11, 1895, p.59; 11, 1897, p.290.

The Sophia Mine on lot 4 was worked in 1892 by the Lee Brothers. It was later worked by the Lake Girard Mica System and by the honourable P. McLaren; no activity was recorded until 1947 when A.C. Sims resumed the production of mica. In 1951 the property was acquired by Dominion Petroleum Reg'd and production continued until 1953.

A small prospect known as the Charest Mine was worked in 1894 on lot 7 and on lot 10, Silvio Lafontaine Mining Co. did some work around 1929.

Templeton & Ottawa Mining Co. owned the deposit on lot 11 S½ which was prospected in 1894 by W.R. Hitchock. The property was acquired around 1907 by J. Prud'homme who extracted a few tons of mica.

The mica showings on lot 13 were known in 1898 at which time the property belonged to the Perkins Mills Mining Co.; in 1925 it was acquired by G. & C. Wallingford Co. No production was recorded.

Lot 14 S½ was a combined phosphate and mica mine; it was opened around 1891 by M.A. Perkins and worked by Mr. Wellington for phosphate. In 1894, Mr. Pullan worked the mine for mica. The mine was then operated succeedingly by Webster & Co., Mr. Perkins, Jurkowski and Co., the Laurentide Mica Co. and the Loyer Brothers in 1909. Around 1925, Arthur Wallingford and Rodolphe Moreau were the owners of the mine which was sold that year to Jos. N. Wallingford. No production was recorded after 1909.

Lot 15 was worked from 1905 to 1909 by the Laurentide Mica Co.

The Victoria Mine on lot 16 was the property of the Canada Industrial Co.; it was acquired in 1900 by L. McLaurin and J. McLaren and Co. who produced a small tonnage of mica.

The Goldring Mine on lots 17, 18 was first worked for phosphate in 1876 by Johns McLaurin. The mine was acquired later by the Papineauville Lumber Co. Ltd. who worked the deposit intermittently until 1935. Phosphate is more abundant than mica in this deposit.

On lot 20, James O'Hagan worked a deposit of mica around 1900 and in 1906 a small production was reported by Mr. Rainville of Perkins Mills.

Lot 21 was prospected for mica in 1899 by Jurkowski and Co.

Range X, lots 2, 7-10, 15-18, 28

Ref.: 1, p.20; 2, p.57; 3, p.75; 4, p.64; 5, p.30; 7, 1899, p.30; 7, 1900, p.19; 11, 1892, p.86; 11, 1894, p.94; 11, 1897, p.280; 12, 1945, p.38; 12, 1946, p.37.

On lot 2 was the Gilmour Mine worked for a short period in 1907. The mica is generally of small dimension and occurs in pyroxenite associated with pink calcite. A serpentine dike cuts the pyroxenite and contains small veinlets of chrysotile asbestos.

Lot 7 was first prospected in 1900 by McLaurin & McLaren. In 1908, Mr. Greer of Montreal did some work on the property near the surface; only small quantities of mica were discovered.

The Marsolais Mine also known as the Lucky Jack on lot 8 was first worked for phosphate around 1892, it was then the property of the Templeton & North Ottawa Mining Co. E. Charette and E. Julien worked the dumps for mica in 1897 as did B. Haycock and W.F. Powell in 1900. Mr. J. O'Brien acquired the property shortly after but did no work on the deposit.

The east half of lot 9 contained the old phosphate mine called the Post. It was worked from 1892 by the Canadian Industrial Co. and from 1895 by Mr. Whyte of New York. The mine was idle for about 10 years and was reactivated in 1907 by O'Brien and production of phosphate as well as mica was recorded until 1909.

The Jackson Rae Mine on lot 9 W½ is also an old phosphate mine which produced several thousand tons of phosphate before 1890. From that year, mica was the main product generally obtained from the dumps of the phosphate workings. The last work in this period was done around 1910 by J. O'Brien. More recently, O. Prud'homme and V. Sabourin produced mica from 1940 to 1943 and the Perkins Mills Mica Co. Ltd. continued the exploitation in 1945 and 1946.

The Jubilee or Smith Mine on lot 10 N½ was first worked for phosphate. McLaurin and McLaren worked the property for mica from 1894 to 1897. The Routhier Mica Mining Company acquired the property in 1907 and Edouard Smith extracted both mica and phosphate in 1909. More recent production was recorded from 1937 to 1944 by the Perkins Mining Co.

The Murphy Mine on lot 10 S½ was also opened for phosphate, mica was extracted from 1892 by the Watters Syndicate and later by A. Murphy. The Sills Eddy Co. who rented the mine in 1900 did very little work on the property.

The Victoria Mine on lots 15 W½ and 16 was opened in 1899 by McLaurin and McLaren. Phosphate and mica were produced until 1910.

Another mine on lot 16 N½ belonged to the Canada Industrial Company, this mine was worked mainly for phosphate but mica is also present in the workings.

Lots 17 and 18 contains mica showings discovered in 1894 explorations.

Lot 28 was the property of the Canada Industrial Company who produced mica and phosphate in the 1880's.

Range XI, lots 7-12, 14, 16B, 20

Ref.: 2, p.59; 3, pp. 78-81; 4, pp. 62, 64; 5, pp. 31-33; 7, 1899 - 1936; 11, 1892 - 1897; 12, 1937 - 1940.

Lots 7 to 11 contain important mica and phosphate mines which have been exploited by the Blackburn Brothers since the early 1880's. The mine was opened by R. Blackburn and T. McLaren who organized the East Templeton District Phosphate Mining Syndicate Ltd.; the mine known as the North Hill Mine has produced mica without hardly any interruption until 1940. When the mine was abandoned it had a surface opening 400 feet long, 180 feet wide and 150 feet deep; the underground workings were at 60' intervals and were served by three shafts one of which went down 160 feet below the surface workings.

Near the turn of the century when the market for mica was at its best, the company employed up to 120 men at the mine and up to 800 young girls for splitting and cutting. Having exhausted the known reserves in 1940, Blackburn Brothers moved all the equipment to Hull township near the Vasavour Mine which had been purchased in 1936.

Mica showings were found in 1898 on lot 12, these were worked in 1910 by John Steward who produced a small quantity of mica and phosphate. Lot 14 was worked around 1887 by Lee Brothers who extracted some 10 tons of mica. More work was done by Clemow and Powell in 1898 and by A. Têtu and others before 1900. Dr. F. Cornu of Ottawa was the owner of this mine.

Indications of mica were found on lot 16 which was worked by the Laurentide Mica Co. Ltd. and on lot 20 which was prospected in 1898.

Range XII, lots 2, 4, 5, 8, 11-14, 20, 21, 24, 27

Ref.: 1, p.20; 2, p.59; 3, p.82; 4, p.64; 5, p.33; 7, 1899, p.31; 7, 1900, p.20; 11, 1894, p.95; 11, 1895, p.59; 11, 1897, p.280.

Lot 2 was the property of Progressive Mining Co. Ltd. which was sold for taxes in 1929; no work was recorded.

Lot 4 was worked in 1909-1910 by E. Watts who sold the property to O'Brien and Fowler in 1910. The latter did much development work but no production is recorded.

P. Hamilton extracted some large mica crystals from lot 5 in 1908, the property belonged to H. Aylen of Ottawa.

Alex McLaurin did some work on lot 8 before 1920, no production is recorded. Lot 11 was worked by the Progressive Mining Company around 1910 and later by Joseph de Rainville and by the Hamilton Syndicate. This property is idle since 1930.

Lot 12 was prospected in 1894 by Mr. Hitchook, in 1907 Messrs. Cox and Emo produced a small quantity of brownish amber mica.

Lot 13 was first worked for phosphate around 1880 by the Templeton and North Ottawa Mining Company. In 1900 the Star Mining Company leased the property and produced about 5 tons of rough mica. The mine was active at intervals until 1910 having been operated by various people.

Clemow and Powell discovered mica on lot 14 in 1894, they did some work in 1897, no production was recorded.

Lot 16 was prospected for mica by Percy Hamilton in the early thirties.

The Laurin Mine on lot 20 was worked by various people at times in the early part of this century. Mica and phosphate were extracted in small quantity.

Lot 21 was principally a phosphate mine worked during more than thirty years at the end of the last century by the Templeton and North Ottawa Mining Co. Dr. Routhier of Ottawa worked the deposit for mica during a few months.

Lots 24 and 27 were mica prospects worked by F. Haycock and Mr. Hayes respectively before 1900.

Range XIII, lots 3-5, 11, 13-15, 17, 19

Ref.: 1, p.20; 2, p.51; 3, p.87; 4, p.64; 5, p.33; 7, 1898, p.34; 7, 1900, p.19; 7, 1901, p.33.

The Battle Lake Mine on lots 3, 4, 5 was first worked in 1898 by F.E. Leushner, and taken over by the Wallingford Mica Co. in 1900. This mine was worked intermittently from 1900 to the early twenties producing a considerable quantity of mica judging by the size of the mine openings.

Mica prospects were worked at the turn of the century on lots 8, 11 and 13.

On lot 14 is a deposit worked by the Progressive Mining Co. around 1910. Mr. Marcelais opened this mine in 1906 and produced about one ton of mica; the mica crystals are said to be small but clear.

Lot 15 was opened in 1901 by Mr. Lachapelle. The mine was active for about 10 years under the direction of A. Debruyne and R. Snowball. Not more than 30 per cent of the mica was of good quality.

TEMPLETON GORE

Lots 3, 6, 8, 17, 18, 38, 39, 42, 43

Ref.: 1, p.20; 2, p.53; 3, p.84; 4, p.64; 5, p.33; 7, 1898, p.34; 7, 1904, p.36; 7, 1906, p.41.

The Lake Rhéaume Mine on lot 3 was opened in 1901 by the Wallingford Mining Company and worked for about five years producing mica as well as phosphate.

Lot 6 was first worked for phosphate in 1904 by Watts and Noble. Kent Brothers operated the mine for mica around 1910.

The King Edward Mine on lot 8 was the property of Messrs. Wallingford, Cornu and Belcourt. No work was done here after 1912.

Lots 17 and 18 were worked from 1904 to 1910 by the Blackburn Brothers; the production was small.

Lot 38 was worked in 1897 by A. Murphy who extracted both phosphate and mica. The mica is light amber.

The Briggs Mine on lot 39 was worked for phosphates in the 1850's by Mr. Stewart of Ottawa. In 1907, Kent Brothers attempted to recover mica from the workings and dump but with little success. The mica is hard, dark in colour and brittle.

John H. Wallingford produced mica from lots 42 and 43 in 1940-41.

THORNE Township, Pontiac county

Range III, lots 2, 3, 51

Ref.: 1, p.19; 3, p.135; 4, p.67; 5, p.57; 7, 1899, p.37.

The Ferreri Mine on lot 51 was opened around 1899 by P. Ferreri but mining activity lasted only a few months. The mica is dark amber and is associated with a little phosphate. Lots 2 and 3 were prospects.

Range VI, lots 2 SW$\frac{1}{4}$, 3 SE$\frac{1}{4}$

Ref.: 13, no.346, p.6 (F); 8 (T.L. Tantan, 1942)

Ambermica of Canada Ltd. produced mica from these lots in 1938. The mica is dark amber and crystals up to 1 foot in diameter are present.

Range VII, lots 13, 14

Ref.: 4, p.67.

A small amount of mica was obtained from these lots.

Range East, lots 32, 33

Ref.: 4, p.67; 13, no.346, p.6 (F)

Wm. S. Wilson produced mica from these lots from 1942 to 1944.

VIEL Township, Montcalm county

Near N-E shore of Hingginson Lake

Ref.: 7, 1937, p.42; 7, 1938, p.43; 8 (P.E. Bourret, 1937, 1938, 1947, 1950).

This mine was opened in 1928 by Jean Valenti who worked it until 1932. In 1937, Chartier and Lanciault did some work followed in quick succession by Laurentian Mica Mines and Products Ltd. and Viel Mica Mines Products Limited. A small production may have been sold in 1938. There are four lenses of phlogopite and calcite on the property, the country rock is granite gneiss. The mica crystals attain one foot in diameter and the production of 3" x 4" cuttings is possible.

VILLENEUVE Township, Papineau county

Range I, lots 4, 7, 29, 31, 32

Ref.: 2, p.15; 3, p.196; 4, p.84; 5, p.48; 7, 1900, p.22; 11, 1885, p.115; 11, 1892, p.87; 11, 1893, p.105; 12, 1942, p.31; 13, no.223, p.9 (F).

Muscovite has been known to exist on these lots since 1844. Some prospection was done in 1900 on lot 4 and production was recorded from lot 7 by Edouard Larmont from 1952 to 1961. The Villeneuve Mine on lots 31 and 32 is well known; it was opened in 1884 by W.A. Allan and was acquired shortly after by the British and Canadian Mica & Mining Co. Ltd., the latter company producing about 35,000 pounds of mica between 1884 and 1888. The mine was active intermittently from 1890 to 1909 under the direction of S.P. Franchot and O'Brien and Fowler. The last activity took place in 1942 when Orphilia St. Amour sold some mica from this deposit.

The Villeneuve Mine is also known for its feldspar of dental grade and for its uraninite which attracted attention as recently as 1966.

The mica and feldspar bearing pegmatite dike is 150 feet wide cutting through garnetiferous gneiss. In addition to the minerals mentioned, the dike contains green apatite, zircon, purple fluorite, beryl, monazite and gummite.

Range II, lots 2, 6

Ref.: 3, p.64; 4, p.65.

Phlogopite was produced in small quantity from the J.B. Gauthier Mine on lot 2 and from the P. Pichette Mine on lot 6. This activity dates back to the early years of this century.

Range III, lots 6

Range IV, lot 1

Ref.: 3, p.64; 4, p.65; 13, no.223, p.9 (F)

Showings of mica are known on lot 6, range III. The Moose Lake Mine on lot 1, range IV was first worked around 1909 by O'Brien and Fowler who extracted a small quantity of mica at the time. In 1939, N.B. Davis acquired the property but no work is mentioned until 1951 when Haleurie Mining Co. reported a small production. The mine was again idle until 1961 when F. Boissonneault produced a small quantity of mica.

WAKEFIELD Township, Gatineau county

Range I, lots 6, 11-16, 18

Ref.: 1, p.21; 2, p.69; 3, p.88; 4, p.59; 5, p.41; 7, 1898, p.35; 7, 1899, p.33; 7, 1900, p.22.

The McBride Mine on lot 6 was worked in a small way from 1892; Mr. Watts of Perth worked it for phosphate around 1900 and the owner, J. Grimes of Ottawa extracted a small quantity of mica

around 1912 following H. Flynn who had worked the deposit for a few months in 1910.

A prospect of mica was known on lot 11 as early as 1892, it has been little worked.

The Haldane Mine on lot 12 was worked by Mark Haldane in 1892 for phosphate and by Ch. Hugues and L.A. Robitaille for mica. Mr. Brown of Cantley worked the dumps for mica and phosphate in 1909. The mine was reopened in 1952 by Adelard Poirier and there was activity on the property until 1960 when production of mica was reported successively by Poirier, O.D. Wilson and Robert J. Halt. The mica is clear amber but often contains rusty stains.

Mica showings were found on lot 13 in 1892. Mica was recovered from lot 14 known as the Allan Mine in the 1920's.

The Comet Mine on lot 15 was one of the first phosphate mines in Canada; it was opened in the 1870's by Messrs. Chitty and Laken; the dumps were worked for mica by Wilson and Chubbock and by Comet Mica Co. from 1894 to 1899. The mica is light amber and of good quality.

H. Flynn extracted some dark amber mica from lot 16 in 1908.

The prospect of lot 18 was worked in 1900 by the Star Mica Co.

Range II, lots 11, 14-18, 23-25

Ref.: 1, p.15; 2, p.69; 3, p.88; 4, p.60; 5, p.42; 7, 1898, p.35; 7, 1899, p.33; 7, 1900, p.22; 7, 1936, p.40; 11, 1892, p.86; 11, 1894, p.96; 11, 1895, p.60;

A mica prospect was worked in 1892 on lot 11 and many prospect pits were dug on lot 14 uncovering broken mica of poor quality.

A small production was reported from lot 15 in 1939-40 by Sergeant & Killy, the mine was the property of A. Martin.

The Kodak Mine on lot 16 was opened for phosphate in the 1880's and was active intermittently until 1908 producing mica and phosphate. Mr. Wilson was the first operator followed by Webster and Co., Wilson and Chubbock, M. and H. Mining and Development and J.S. King. More recently, A.G. Martin reported a small production in 1936, the mine was acquired by Kodak Mica Co. in 1942 and by Industrial Mica Co. Ltd. who produced some mica in 1942 and 1943. The mica is light amber and of good quality.

The Kitty Lynch or Morris Mine adjoins the Kodak Mine to the east on lot 17 E$\frac{1}{2}$. It was opened in 1892 by Mr. Morris who worked it a few months at that time. In 1907, H. Flynn extracted about 25 tons of good quality mica. A small production was reported by Jos. Morris in 1937-38. Large crystals of mica are frequently large in this mine.

The Seyhold Mine on lot 18 was opened for phosphate by Mr. Seyhold in 1892. In 1903 Mr. McLean of Ottawa worked the mine for mica and in 1907 Messrs. Holland and Moore extracted a small quantity of mica.

The Lake Girard Mine on lots 23, 24 was opened in 1890 by Messrs. Skeade, Paul and McVeity who sold it in 1891 to the Lake Girard Mica Mining System; the latter company produced more than 3,000 tons of mica between 1891 and 1896. The dumps were reexamined and some mica was recovered during the years 1896 to 1904 by the Mica Mining and Manufacturing Co. In 1945-46, Waldick Wallingford reported a small production from this mine.

On lot 25 was a mica prospect worked in 1892.

Range III, lots 1, 9, 13, 16, 17

Ref.: 3, p.95; 4, p.60; 5, p.45; 7, 1898, p.35; 11, 1892, p.86; 8.

William Fairburn operated a small deposit of mica on lot 1 in 1898.

Edward McGarry produced mica on lot 9 from 1936 to 1943 selling the output to Mica Company. Pink Lake Mica Mines Ltd. took over the property in 1946 but no work was reported.

Showings of mica were found on lot 13 in 1892.

The deposit on lot 16 was worked by Kent Brothers in 1906 and from that time until 1910 by Mr. Snowball of Ottawa. The mica is light amber and of good quality.

On lot 17, G. Morris Cleary and A. Poirier produced mica in 1934-36; the deposit was known at the turn of the century but no work had been done on it.

Range IV, lots 14, 15, 18, 19, 23, 25

Ref.: 3, p.95; 4, p.60; 5, p.45; 7, 1899, p.34; 11, 1892, p.86.

Mica showings were found in 1892 on lots 14, 15, 18 and 19.

On lot 23, J. Rainville extracted a few tons of rough mica in 1907.

The only recent work in range IV was on lot 25 where R.J. McGlashan & Co. produced mica from 1939 to 1943. The deposit was prospected in 1899 by Fortin & Co. and a small quantity of mica was extracted.

Range V, lots 25, 27, 28

Ref.: 4, p.60; 8 (P.E. Bourret 1943, 1952)

The deposit on lot 25 was worked from 1899 by Fortin & Co. who also worked the deposits on lot 25 in the adjoining range IV.

In 1935-36, Wm. McGlashan reported a small production and continued to extract mica in partnership with Pierre Deschênes until 1943; Alex Déziel acquired the property in 1943 and leased it to Victor Trudeau who produced a small quantity of mica that year. Alex Déziel reported a small production in 1956 and continued exploration on the property until 1967. The mica is light amber and a good proportion is of excellent quality.

Some important workings also exist on lots 27, 28. David De Rainville did some work there in 1936 but no production was reported.

Range VI, lots 12, 21, 22, 26, 27, 29

Ref.: 3, p.95; 4, p.60; 5, p.45; 7, 1898, p.35.

Lots 12, 21 and 22 contain mica outcrops explored around the turn of the century. The deposit on lot 26 was opened in 1905 by R.W. Eady who worked it continuously until 1912. Jos. De Rainville did some work at this mine around 1927 but no production was recorded. The mine was also rich in phosphate.

On lot 27, a deposit discovered in 1898 produced mica from 1939 to 1943; the operator was R.J. McGlashan who also worked a deposit on lot 29.

Range VII, lot 25

Ref.: 3, p.199; 4, p.88; 5, pp.19, 45; 7, 1899, p.38; 7, 1926, p.55; 14, p.140.

The Leduc Mine on lot 25 is known since 1884 when about a ton of lepidolite was extracted from the deposit. This mine is famous for the variety of minerals found in the pegmatite; green feldspar (amazonite), peristerite, garnet, red and green tourmaline which was tentatively extracted as a gem. Small quantities of fluorite, gummite and uraninite are also present.

Range VIII, lots 20, 25, 27, 28

Ref.: 3, p.95; 4, p.60; 5, p.45; 7, 1898, p.35; 11, 1892, p.86.

The most important workings were on lot 25; the other lots contain mica outcrops but no work was done on them.

Range IX, lot 19

Ref.: 3, p.95; 5, p.45.

Mica outcrop were known at the turn of the century.

WALTHAM Township, Pontiac county

Range A, lots 7, 8

Ref.: 1, p.18; 3, p.138; 4, p.67; 5, p.58.

A small amount of mica was extracted from these lots in 1900.

WELLS Township, Papineau county

Range I, lots 46-50

Ref.: 4, p.66; 8 (P.E. Bourret, 1942, 1943); 12, 1946, p.31; 12, 1943, p.55; 10, no.68, p.18.

Dark amber mica occurs in lenses within pyroxenite on these lots. The White Mica Mine started operations in 1941 and produced several thousand pounds of knife trimmed mica in 1942 and 1943. Twelve men where employed at the mine and another 20 persons were employed in the cutting plants at Notre-Dame-du-Laus and Notre-Dame-de-la-Salette.

Range II, lots 18, 48

Ref.: 10, no.68, p.18

On lot 18, there are pits which were dug for phlogopite but there is no record of production. On lot 48, J.B. Gauthier opened a mine in 1940 and produced mica until 1945.

Range III, lots 14, 30

Ref.: 4, p.66; 10, no.68, p.18

The Oriole Mine on lot 14 was worked in the 1920's and reopened in 1942 when E.J. McCabe produced some mica which he sold to W.C. Cross.

On lot 30, there is evidence of prospection for mica but no production is recorded.

WENWORTH Township, Argenteuil county

Range I, lot 22

Ref.: 8 (P.E. Bourret, 1944); 12, 1944, p.37.

On this lot L.P. Dessureault and Leo Joanisse produced phlogopite in 1944, Louis Gagné took over the property that same year and mica production was resumed under his direction until 1951 when his mining rights were sold to C.C. Pitre. Production continued intermittently until 1961, the last operator was Alex Poitras. The mica is dark amber and occurs frequently in large sheets. The output was sold to Mica Company of Canada in Hull.

Range VII, lots 22, 24

Range VIII, lot 23

Ref.: 5, p.59; 9, 1936-C, p.35; 11, 1892, p.89.

Lot 22 was prospected in 1892; some mica and phosphate was found in the pyroxenites. Mica is also mentioned as occurring on lot 24, range VII and lot 23, range VIII.

Range X, lots 19, 20, 21

Ref.: 4, p.67; 7, 1901, p.33; 7, 1935, p.32; 7, 1937, p.42; 9, 1936-C, p.34.

A mica mine was opened on lot 19 by Charles Guertin in 1901; William and Thomas H. Argall took over the property shortly after and operated the mine for a number of years. In 1925 the mine was sold to Georges l'Heureux who sold it to Laurel Mining Co. Ltd. in 1928. Mr. l'Heureux continued to manage the property until 1931. Work and production cintinued until 1952 in short

periods by J.I. Gourdeau in 1935; by Quebec Mica Co. Ltd. who reported a small production in 1937; by the Big Four Mica Syndicate Reg'd who did some work in 1938; and by Ph. Richard who produced a small quantity of mica in 1952. The mica is dark amber and of medium size.

Another small mica prospect occurs on lot 21 E½, work was done there around 1915 by E. Radier.

WRIGHT Township, Gatineau county.

Range V, lot 12

Ref.: 1, p.18; 3, p.25; 4, p.61; 5, p.54; 7, 1898, p.36; 7, 1899, p.36.

This mine was opened in 1897 by Richard Moore who worked it until 1904. The mica is medium amber and of small dimension.

Range VI, lots 5, 47

Range VII, lot 13

Ref.: 3, p.126; 4, p.61; 5, p.54.

The mine on lot 5 was opened in 1905 by Allan Thayer who worked it until 1910. The colour of the mica is mixed, the sheets are often of good dimension but fracturing is common. White mica (muscovite) is reported to occur on lot 47, range VI and on lot 13, range VIII.

Range A, lots 6-8, 37

Ref.: 1, p.18; 2, p.71; 3, p.123; 4, p.60; 5, p.52; 7, 1898, p.36; 7, 1900, p.21; 7, 1901, p.33; 7, 1903, p.59.

The Chaibee Mine on lot 6 to 8 was opened in the early 1890's by the Lake Girard Mica Co. from 1898, T.J. Watters operated the mine until 1900 when it was sold to Webster & Co., the latter did very little work and sold its interests in the mine to General Electric Company in 1902. The mine was idle until 1961 when Wm. Trudeau and Charles Boland produced some mica which was sold to W.C. Cross. The mica is dark amber and occurs at the contact of pyroxenite and gneiss.

The Faure Mine on lot 37 was prospected in 1897 but no production is recorded.

Range V, lots 15-19

Ref.: 4, p.61; 8 (A.O. Dufresne, 1929).

These are mica prospects with no record of production.

Range D, lots 14-16

Ref.: 2, p.72; 3, p.124; 4, p.60; 5, p.52; 7, 1898, p.35; 7, 1899, p.36; 7, 1900, p.21; 11, 1892, p.88; 13.

The important mine on these lots is the St. Antoine Mine also known as the Father Guay or Morin Mine. It was opened in 1891 by C. Guay who produced a considerable amount of mica until 1899. At that time, the mine was leased to W.H. Sills Mica

Co. for one year. There was no activity until 1908 when the mine was leased to Labelle and Boisvert who worked it for 9 months. Phil. Laurin and later H.T. Flynn did some work on the property in the early 1920's but no production is recorded. The mica is amber of medium colour. The maximum dimensions are 5 to 7 inches in diameter.

There are small mica deposits in the adjoining lots 14 and 16. Webster & Co. produced a small quantity of mica from lot 14 in 1893 and on lot 16 Mr. L'Ecuyer discovered mica around 1892 and leased the property to various operators among which was H. Flynn who was the last to work the deposit in 1910.

OCHRE AND BOG IRON ORE

Iron oxides and hydroxide used as natural mineral pigments are called ochres. The iron minerals are usually mixed with clay and other siliceous materials and depending on the percentage of mixture and the type of iron mineral present, the colour will vary from yellow to red.

The yellow ochres found near Siena in Italy are often called Siennas, they contain hydrated iron mixed with clay. The colour quickly changes to brown when sufficient heat is applied to dehydrate the iron mineral.

Another town in Italy, Umbria, produced brown ochre which is called Umber. The colour is mainly due to the presence of manganese in the mixture.

Natural red ochres are only found in Persia and Spain, the colour is due to the presence of the mineral hematite in abundance.

There are many known occurrences of ochre in Quebec and the only canadian production recorded has been from this province. The years immediately following world war II have been the most active for the industry when more than 10,000 tons per year were produced; this activity lasted until 1954 and from then on the production curve decreased steadily until 1968, less than 100 tons were produced in the vicinity of Trois-Rivières.

The bog iron deposits near Trois-Rivières are known since the early days of colonization in Canada. De La Portardière mentions them in 1667 and Frontenac in 1672. Canons and canon balls were important items of export to France from 1749 to 1756.

The mining history of these deposits as pigments coincides with the history of Canada Paint Company from 1887; production was continuous until 1966 when Sherwin Williams of Canada Limited, the parent company of Canada Paint Company, sold the property to Red Mill Industries. The latter ceased all operations in 1968 after reporting a small production during two years.

The origin of the iron is about the same in all the ochre deposits in Quebec. Streams dissolve the iron in older formations and deposit a precipitate where physical and chemical conditions are favourable. The iron oxydes often form concretions ranging in size from very small up to 8 inches in diameter. The beds are horizontal and lie near the surface on sand or clay often covered with peat and vegetable matter, their thickness varies from a few inches up to 20 feet.

After calcination at temperature of about 1600°F, the ore is rid of all organic matter and the ferric oxyde content may vary from 75 to 93 per cent. The milling operations include grinding and often air flotation to obtain a product passing through 300 mesh.

Natural iron oxides have been used as pigments since prehistoric times and many art objects of ancient civilization attest to the beauty and durability of the colours. They are often used as polishing material and are known as jewellers rouge. In Quebec, many producers operated mines and prepared a product of inferior quality for the purification of coal gas.

Natural iron oxide pigments are no longer produced in Quebec, they have been replaced by synthetic pigments which are more expensive but are nevertheless preferred because of the uniformity of colour, chemical composition and grain size. They are also easier to grind, have a high covering power, and are appreciated for the lasting qualities of the colours, their good protection against ultra-violet light and their resistance to acids and alkalis.

In the United States, the tendency of replacing the natural pigments with manufactured ones is not so apparent. In 1958, for instance the finished iron oxide pigments sold by processors amounted to a total of 98,422 tons valued at $15,822,000. Natural pigments accounted for 30,553 tons valued at $2,463,000. and thus represented about 31 per cent of the total tonnage and 15.6 per cent of the total value. In 1967, the figures were 127,338 tons valued at $26,720,000. for the total, and 58,520 tons valued at $6,033,000. for the natural pigments. The natural pigment portion of the total had thus increased to 46 per cent in volume, and 22.5 per cent in value.

All this to show that the industry is not dead at least in the United States and may possibly be revived in Quebec where there are still some deposits of iron oxides with considerable reserves.

Principal References

(1) Quebec Department of Colonization, Mines and Fisheries, Annual Report.

(2) Canada Dept. of Mines, Mines Branch, Summary Report.

(3) Quebec Dept. of Mines, Geological Report no.

(4) Geological Survey of Canada, Annual Report.

(5) Geology of Canada 1863

(6) Office Files

(7) Quebec Bureau of Mines, Annual Report.

(8) Mines & Minerals, Quebec, by Obalski, 1889.

(9) Mining Operations in the Province of Quebec.

(10) Geological Traverses in the counties of Maskinongé, Saint-Maurice, Champlain, Portneuf, Quebec, Montmorency, Department of Colonization, Mines and Fisheries, Quebec, 1928, p.8.

(11) Mineral Pigments of Canada, G.S.C. 1906.

(12) Geological Survey of Canada, Report of Progress.

LIST OF OCCURRENCES

ACTON Township, Bagot county

Ref.: 8, p.25.

A deposit of bog iron in this township furnished the ore for the operations of J.M. McDougall and Co. from 1880 to 1905 near the shore of the St. Francis River in Grantham township.

AMHERST Township, Terrebonne county.

Range VI, lot 6.

Ref.: 1, 1923, p.70; 2, p.8, 1922.

Yellow ochre bed with clay base lying under a bed of gravel three or four feet thick. No development work was done on this deposit.

ARNAUD Township, Duplessis county.

Ruisseau Rouge

Ref.: 3, no.11, p.22.

Ochre of good quality but in small amount occurs along Ruisseau Rouge, a small tributary of Marguerite River one or two miles north of the St. Lawrence.

ASCOT Township, Sherbrooke county.

Range IX, lot 16.

Ref.: 4, vol. IV N.S., p.117K

A deposit of ochre on this lot was never developed and little is known about it.

ASTON Township, Nicolet county.

Near St. Wenceslas

Ref.: 8, p.25.

Bog iron ore was recovered from this deposit for the operations of J.M. McDougall & Co. from 1880 to 1905 (see Grantham township).

BAGOT Township, Dubuc county.

Range II

Ref: 8, p.27.

Bog ore is said to occur in range II of this township.

BATISCAN Seigniory, Champlain county.

Des Forges Range

Ref.: 6; 8, p.27.

An ochre deposit was worked in the 1930s by Montmorency Paint Products Co. Ltd; work was abandonned around 1937 apparently because of exhaustion of the deposit.

First concession north of Batiscan River,

lots 61-66, 154, 155.

Ref.: 6 (A.O. Dufresne).

Deposits of ochre of which little is known are on these lots.

BEGIN Township, Dubuc county.

Along Rivière-des-Aulnais and Bear River

Ref.: 4, 1883 (J.C.K. Laflamme)

Ochre reported at this location but little is known about the deposit.

BERGERONNES Township, Saguenay county.

Range I, lots 8, 9

Ref.: 7, 1929, pt. D, p.103; 7, 1930, pt. B, pp. 105, 106, 110, 111.

This deposit was first described by C. Faessler in 1929. In 1951, Strategic Materials Corporation studied the occurrence in detail and found 5 small ochre areas along a line 1,300 feet long in an E.W. direction and averaging less than 100 feet wide. The ochre bed lies beneath a thin cover of peat, it measures from 10 to 20 inches in thickness. The proved tonnage was about 1,500 tons of material analysing over 95% Fe_2O_3.

BETSIAMITES Township, Saguenay county.

Blocks H, I, J, K, L and adjoining lands.

Ref.: 7, 1931, pt. C, pp. 33-40; 1932, pt. D, pp. 130-132; 8, p.36.

These ochre deposits near Ilets Jérémie are known since 1889 and are mentioned in a report by J. Obalski (ref. 8). C. Faessler (ref. 7) sampled them in 1931 and 1932 and found ideal conditions for the accumulation of ochre.

The Grande Savane deposit west of Block H was sampled over a length of 1,200 feet and a width of 190 feet which represents only part of the marsh. The thickness of the ochre bed varies from a few inches to more than 11 feet. The mean of 104 analyses showed 87.32% Fe_2O_3. The colour varies from red to grey-black to blue.

Another deposit situated about 1,000 feet south of the Grande Savane covers an area of about 6,000 square feet in which the ochre bed is more than four feet. An average of seven analyses gave 69.84 per cent Fe_2O_3.

A narrow ochre deposit occurs along the Fortin creek in blocks I, J, K, L; it measures 2760 feet in length and averages 50 feet in width. The average thickness is 4.5 feet. The mean of 117 analyses showed 72.1 per cent Fe_2O_3.

There are many other smaller deposits in the vicinity and there is little doubt that a careful search would disclose more such accumulations of ochre.

BOURGET Townshin, Dubuc county.

Along Rivière-des-Aulnaies.

Ref.: 4, 1883 (J.C.K. Laflamme)

Ochre reported at this location by Laflamme.

BOURG LOUIS Seigniory, Portneuf county.

Fer à Cheval Concession, lots 612, 613.

Ref.: 2, 1919, p.18; 6 (A.O. Dufresne, 1916, P.E. Bourret, 1958)

9, 1921, p.50 (F).

This deposit was first worked by Patrick Allan and Napoléon Piché around 1896; they produced a few barrels of a calcined material which was used for painting cottages. In 1958, and the following years until 1965, Bruno Gelinas produced a small tonnage which was sold in Quebec for the purification of coal gas. The deposit is located between the road and the Ste. Anne River on the side of a hill. The excavation is small, measuring 20' x 15' and and 7 feet deep. An analysis of the calcined material in 1916 gave 90.83 per cent Fe_2O_3.

Concession V, S.W.

Lot 658

Ref.: 10, p.9.

Several ochre deposits are found near the Ste. Anne river but it is most abundant on lot 658, concession V, southwest. An average of 50 analyses gave 42 per cent Fe_2O_3 for calcined material.

CACOUNA Seigniory, Rivière-du-Loup county.

Ref.: 8, p.27.

Locality mentioned as containing bog iron ore.

CAP DE LA MADELEINE Seigniory, Champlain county.

Concession Côteau St-Pierre, parish of La Visitation, lots 339-346, 380-392 and 346.

Concession St. Malo, lots 442-475 and 485.

Ref.: 6 (O.D. Maurice, 1967); 2, 1919, p.17; 8, p.34.

These lots contain the most important ochre deposits in Quebec from which a considerable tonnage of material was extracted since 1884, when Williams Johnson Co. of Montreal started to manufacture a special paint called "Johnson Magnetic Iron Paint". In 1887, the processing plant and property were sold to Canada Paint Company who produced mineral pigments continuously from that year. Other operators on these lots were the St. Maurice Metallic Paint Co., the Champlain Oxyde Co. and Thomas H. Argall who produced for a number of years and eventually sold out to Canada Paint. From 1931 the operations are conducted by Sherwin Williams of Canada which is the parent company of Canada Paint. In 1966 James A. Bradley who was manager of the operations for Sherwin Williams at Red Mill, takes over the property and continues production on a reduced scale under the name of Red Mill Industries; his efforts to revive the ochre industry in the area were not to be successful principally because of the reduced demand for natural pigments.

These ochre deposits lie under one or two feet of overburden, their thickness varies from one foot to 18 feet; the top layers are yellowish and the bottom ones are black, in between the colour varies from green to brown to red. The uncalcined material contains approximately 50 per cent Fe_2O_3.

St. Michel concession, Parish of N.D. du Mont-Carmel

lot 746, 904

Ref.: 3, no. 97, p.41; 6 (A.W. Waddington, 1946; P.E. Bourret, 1941).

This deposit was worked between 1935 and 1958 by Charles Girardin who sold his production in Montreal mainly for the purification of coal gas. It was sampled elaborately in 1944 and 1945 over an area of 200 acres, the mean Fe_2O_3 content of the ore as extracted was 62 per cent. The maximum thickness encountered was 16 feet.

Lots 547, 548, 550
Parish of St. Louis de France
Ref.: 6 (P.E. Grenier, 1955)

These deposits situated near the St. Maurice river between Rapide-des-Forges and Bâtture-à-la-Piastre was worked between 1947 and 1953 by J.H. Haessler and Oscar Léveillé. In 1955, Charles Girardin took over the operations and produced some ochre during a short period. Under 5 feet of clay, a horizontal layer of ochre varies in thickness from one to 15 feet. The opening measures about 400 square feet.

Parish of St. Maurice
St-Felix Range, lots 710-715
Ref.: 3, no. 97, p.41; 8, p.25.

This deposit is important not because it has furnished material for mineral pigments but because it was one of the sources of iron for the Radnor Forges. These foundry works were built in 1860 at Radnor and were active until 1910. Around 1865 they were producing about 2,000 tons of pig iron from 4,000 to 5,000 tons of ore

taken largely from the St. Felix range. The bog iron deposit measured about one mile wide and three or four miles long. An analysis of the bog iron from this deposit is given in reference 3, no. 97, p.49.

	Wt %
Fe_2O_3	60.74
MnO	1.18
Al_2O_3	2.59
CO_2	3.47
MgO	0.93
P_2O_5	0.64
SO_2	0.19
SiO_2	13.94
L.O.I.	16.49

CARLETON Township, Bonaventure county.

Ref.: 11, p.17.

A deposit of ochre is mentioned which is free from grit and from which good quality paint was produced. The dimension of the deposit is not known.

CAXTON Township, St. Maurice county.

Range III, lots 1, 2

Ref.: 12, 1952-53; 8, p.27.

Five patches of yellow ochre were found in this vicinity, the largest is only six square yards and the thickness of the bed is 12 to 15 inches.

CHAMPLAIN Seigniory, Champlain county.

Des Chutes Range I, lots 284-288

Ref.: 8, p.27; 6 (M. Boyer, 1930)

Thos. A. Argall worked these lots for a number of years until 1931. The ochre was used exclusively for the purification of illuminating gas.

COTE DE BEAUPRE Seigniory, Montmorency county.

Parish of Ste. Anne de Beaupré,

Range I, lot 38

Ref.: 2, 1919, p.18; 6 (A.O. Dufresne, 1922); 7, 1921 to 1929.

The Montmorency Paint Products Co.Ltd produced high quality ochre at this location between 1922 and 1930. The deposit apparently was exhausted when the company moved to the region of Trois-Rivières at "Les Forges" in 1930.

DE MONTS Township, Saguenay county

St. Augustin Cove

Ref.: 3, no. 11, p.21; 6 (B.T. Denis, 1950).

The ochre deposit is found at about sea level at the foot of steep slope. The accumulations of ochre are washed away by the tide as soon as formed.

DURHAM Township, Drummond county

Range IV, lot 4

Ref.: 8, p.36; 2, 1919, p.18; 9, 1913, p.59.

The ochre deposit is small but the material is of good quality. The ochre was traced along a zone 30 feet wide for a distance of 450 feet, the depth is one to four feet.

FOSSAMBAULT Seigniory, Portneuf county

Range V, lots 369, 370

Ref.: 6 (G.W. Waddington)

Several small deposits of ochre in this vicinity. One of these measures 50 feet in diameter and has a maximum thickness of 15 feet. A sample assayed 69.25 per cent Fe_2O_3.

GENTILLY Seigniory, Nicolet county

Parish of Ste. Marie de Blandford, lot 869

Ref.: 2, p.18; 6 (P.E. Bourret, 1963).

One extensive deposit of sandy ochre between the base of a high sand hill and the Gentilly river was worked near the turn of the century by Ouellet and Thibodeau. In 1963, Omer Thibodeau was interested in this deposit and has an analysis made at the Pilot Plant in Quebec; the results were as follows.

SiO_2	24.54
Al_2O_3	1.82
CaO	1.8
MgO	0.25
Fe_2O_3	51.64
L.O.I.	18.85

GRANTHAM Township, Drummond county.

Range I

Ref.: 8, p.24; 13, LN 1748, 1-2 (1933).

This deposit was one of the sources of bog iron ore for J.M. McDougall and Company which operated blast furnaces near the St. François River in Grantham township from 1880. These furnaces were in continuous operation until 1905 under the direction of J.M. McDougall, from that time the control of the iron metallurgy of the province of Quebec passed to the Canadian Iron Corporation Ltd who continued to operate the furnaces of Grantham for a few years only.

In 1933, Armand Martel submitted two samples from the deposits of Grantham to the laboratories of the Mines Branch in Ottawa. The dark brown ore was found to be suitable for the production of mineral paints.

GRENIER Township, Saguenay county.

Near Baie-des-Pêcheurs

Ref.: 3, No. 11, p.22.

Small ochre deposit near the junction of two small brooks. The deposit covers an area of 700 feet by 60 feet and may contain about 50,000 cubic feet of ochre as indicated by bore holes. The ochre is of very good quality.

GRENVILLE Township, Argenteuil county.

Range VII, lot 17

Ref.: 4, vol. XII, N.S. p.136J, 1899; 7, 1936, pt. C, p.28.

This deposit lies on the east side of a serpentine ridge; no work has been done there since the 1890's.

HAM SOUTH Township, Wolfe county

Range I, lot 28

Ref.: 8, p.27.

A deposit of bog iron ore is reported on this lot.

HARTWELL Township, Papineau county

Range I

Ref.: 3, no.33, p.27 (F).

East of the village of Chénéville, a coarse sand rich in iron has been used locally for making paint. This area offers good possibilities for the discovery of important bog iron ore deposits.

HULL Township, Gatineau county

Range X, lot 15

Ref.: 4, vol. IV, N.S. p.116; 11, p.23.

Several acres of ochre are found underlying a clay soil. The ore is slightly gritty but makes a good brownish-red paint when ground in oil.

IBERVILLE Township, Saguenay county.

Range I, lot 18

Range II, lots 21, 22

Range III, lot 23

Ref.: 7, 1930, pt. B, pp. 103-105; 8, p.35; 2, 1920, p.11; 9, 1916, 1917, 1918, 1921 and 1922.

This deposit has had a long history starting in 1883 when Thos. H. Argall prepared ochre for the market until 1889. The area was again active between 1916 and 1923 when several operators, notably the Paint River Oxide Company Reg'd installed facilities for the production of ochre on a large scale.

The deposit measures 400 feet by 1,500 feet: it was sampled in 1930 and found to contain 450,000 square feet of ochre averaging one foot in thickness and 86.88 per cent Fe_2O_3.

ILE VERTE Seigniory, Temiscouata county

Ref.: 8, p.27.

Bog iron ore is reported to occur at this location.

IRELAND Township, Megantic county

Range IV, lot 12

Ref.: 8, p.27.

Locality mentioned by J. Obalski as containing bog iron ore.

KILDARE Township, Joliette county

Range I, lots 7, 8

Range II, lots 7, 8

Range IV, lot 7

Range V, lot 7

Range X, lot 11

Ref.: 8, p.27; 4, vol. VIII, N.S. p.145J (1895).

These localities are mentioned by J. Obalski as containing bog iron ore. Near the surface to a depth of one foot the ochre is dark yellow and impure being mixed with sand, lower down it has a purer character.

KILKENNY Township, Terrebonne county

Range VII, lot 7

Ref.: 4, vol. VIII, N.S. 1895.

This ochre occurrence near the edge of the Morin anorthosite is of no economic importance.

LABRECQUE Township, Lac St. Jean county

Near upper portion of Mistook River

Ref.: 4, 1883 (J.C.K. Laflamme).

Ochre reported at this location but little is known about the deposit.

LAC DES DEUX MONTAGNES Seigniory, Deux Montagnes county

At. St. Eustache

Ref.: 8, p.27.

J. Obaslki reports the presence of bog iron ore at this location.

LACHENAIE Seigniory, Joliette county

At Ste. Elizabeth

Ref.: 11, p.18, 25

Slightly gritty ochre which produces a raw sienna when ground in oil.

Ste. Rose and Ste. Emilie ranges

Ref.: 11, p.18.

Small patches one to three inches thick of a gritty ochre. A very smooth paint is obtained when ground in oil giving a golden bright colour.

LAUZON Seigniory, Levis county

At St. Lambert

Ref.: 8, p.27.

Bog iron ore is reported at this location.

LAVIOLETTE Township, Maskinongé county

Near Rivière-du-Moulin

Ref.: 4, 1892.

A deposit of ochre was worked prior to 1892 on the east shore of Rivière-du-Moulin, 3.5 miles northwest of Lac-des-Pins.

LEEDS Township, Mégantic county

Range XIII, lot 17

Ref.: 4, Vol. IV, N.S. p.118K.

A soft talcose slate showing yellow and greyish-white bands has been used locally for painting. The yellow bands are due to the presence of iron hydroxides.

LESLIE Township, Pontiac county

Range II, lot 30

Ref.: 11, p.19; 14, no.74, p.134.

Slightly gritty ochre which gives a paint approaching raw sienna when ground in oil.

LORANGER Township, Labelle county

Range VII, lots 58 and 59

Ref.: 3, no 23, p.41.

A "paint mine" is reported to occur near the line separating lots 58 and 59. It is probably a small deposit.

LOTBINIERE Seigniory, Lotbinière county.

Near the mouth of Grande Rivière du Chêne

Ref.: 4, N.S. IV, p.117K

A deposit of ochre is reported at this location.

LYNCH Township, Labelle county

Range III, lots 18-21

Range IV, lots 18-21

Ref.: 2, 1919, p.18; 7, 1921, pp. 58-59: 7, 1934, pt.E, pp. 43-45.

These are a well known ochre deposits which were probably exploited by the indians as well as by early settlers. The first modern work seems to have been done in 1917 when Paint Products Co. Ltd. did considerable exploration to prove a workable deposit and continued exploitation for a few years. Other operators succeeded each other until 1926 when the plant burned down and all activity ceased. A brief period of activity was registered around 1933 when Canadian Siennas tried to prove a process of separating colours by gravity, there has been no work done in this area since that time.

Four bogs are known to exist on these lots only one of which has been exploited; more than 200,000 tons of commercial grade ochre is estimated to exist in these bogs. The thickness of the deposits varies from a few feet to nearly 50 feet.

MANICOUAGAN Township, Saguenay county

Block A, lots 1 to 6

Ref.: 2, 1920, p.11; 7, 1932, pt.D, pp. 135-139; 8, pp. 35, 36.

The ochre deposits at Paint Bay between Manicouagan point and Paradis point have been known at least since 1866 when letters-patent covering three of the lots were granted to Mr. McDale.

The ochre occurs at the base of small escarpments near the St. Lawrence River, These are small deposits separated by large expanses of swamp which do not contain any ochre. The average thickness found in fifty-one soundings war two feet four inches. The average of sixty one analyses is as follows:

Organic matter	26.44
SiO_2	15.46
Fe_2O_3	79.04
Mn	0.152

In 1950 there was an attempt at revival of these ochre deposits by Amalgamated Mines and Minerals Corp. and its subsidiary Manicouagan Pigments Corp. Although the engineering reports and the

geological studies indicated an encouraging situation, the project was allowed to lapse and no more work was done on these deposits which are still almost intact.

MANSFIELD Township, Pontiac county

Grand Marais

Ref.: 8, p.36.

Ochre occurs in considerable quantity in the Grand Marais opposite the northern extremity of Calumet Island.

MARCHAND Township, Labelle county

Range SW of Rivière-Rouge, lots 74, 75

Range NW of Rivière-Rouge, lots 76, 77

Ref.: 6 (A. Mailhot, 1920); 15, 1940, pp. 25-29.

This ochre deposit near l'Annonciation was the subject of a report by A. Mailhot in 1920. In 1934, Eugène McNicoll started to extract a small quantity of ochre from the north part of the deposit. Laurentian Iron oxyde took over the property in 1935 and Iron Oxyde Products Co. Ltd. succeeded the latter in 1937. A total of about 1,200 tons of ochre were produced in the few years of activity between 1935 and 1940.

The deposit lies in the old bed of the Rouge River, less than one thousand feet to the west of its present course. A crescent

shaped swamp some 2,200 feet long and 200 to 600 feet wide contains the ochre deposits. A total of 204 bore holes were made in 1940 to delineate the ochre deposits in this swamp, three pockets of ochre were found and the total volume estimated was 595,500 cubic feet lying under one to 12 feet of peat. The average thickness of the ochre bed is about 39 inches; the mineral is often mixed with a large quantity of peat or sand.

MARGANE Township, Duplessis county

Near Dock Bay, between Rivière-au-Tonnerre and Rivière Jupitagan

Ref.: 7, 1899, p.10 (F)

Near the sea shore, a layer of black sand ten inches thick is overlain by five inches of yellow ochre.

McGILL Township, Papineau county

Range VII

Ref.: 3, no.68, p.18.

A small deposit of ochre is reported a little to the south of Serpent river.

NEUVILLE Seigniory, Portneuf county.

Range Ste. Marie, lot 188

Ref.: 6 (C.W. Waddington, 1946)

Concretions of limonite up to 2 inches in diameter are found on the property of Antoine Martel; sand and gravel pebbles are cemented with iron oxyde. Small deposits of ochre are found near streams.

NEWPORT Township, Gaspé South county

Along the West river

Ref.: 9, 1912, p.123.

Patches of red ochre are found at the foot of cliffs. The oxide of iron originates in certain beds intercalated in schistose rocks and carried down stream to be deposited at favourable locations. None of the ochre patches found had any volume of interest.

ONSLOW Township, Pontiac county.

Range III, lot 7

Ref.: 4, vol. VII, N.S. p.61 A.

An extensive deposit of ochre of excellent quality is said to occur on this lot.

PELLETIER Township, Roberval county

Range I, lots 5, 6

Ref.: 6 (H. Girard, 1951).

An ochre deposit 1,800 feet long and 50 feet wide occurs at the foot of a steep bank near the shore of the Mistassini River. Some pockets may have accumulations of 1.5 to 2.0 feet in thickness.

PETITE NATION Seigniory, Papineau county

Near Bourassa road

Ref.: 3, no.33, p.27 (F)

A small ochre deposit of good quality is found near a small stream discharging lake Benjamin. The deposit measures 150 feet by 40 feet, the thickness of the ochre bed is two feet or a little more at some places. An analysis has given the following results.

Fe_2O_3	83.76 per cent
MnO	0.46 per cent
SiO_2	7.60 per cent.

POINTE DU LAC Seigniory, St. Maurice county

Range L'Acadie, lots 364, 365, 379, 380

Range St. Nicholas lots 505, 506

Ref.: 6 (A.W. Waddington, 1945; A.O. Dufresne, 1921) 11, 1906, p.25.

This ochre deposit was worked for a number of years from 1931 by Thos. A. Argall; the deposit was nearly exhausted at the time of Mr. Argall's death in 1945; his widow continued to buy and sell ochre until 1957.

PORTNEUF Seigniory, Portneuf county

Parish of Cap Santé

Ref.: 8, p.27.

J. Obalski mentions the occurrence of bog iron ore at this location.

RADNOR Township, Laviolette county

Lac-à-la-Tortue, ranges VIII and IX

Ref.: 3, no.97, p.41; 8, p.25.

This lake deposit was very productive from about 1860 and furnished the ore for the blast furnaces at Radnor and Les Petites Forges. It covers most of the bottom of Lac-à-la-Tortue and extends unto the beaches. Near the outlet of the lake, it seems that the ore is continuously being deposited and the deposits are rapidly replenished after mining. The ore consists of flat concretions composed of concentric layers of iron oxydes and a core of silica. No dredging has taken place since 1910 when the "Radnor Forges" closed down.

Range Grande Ligne

Lots 38-42

Ref.: 2, 1919, p.17; 3, no.97, p.41; 4, Vol. V, N.S. p.48-A.

This deposit, at the headwaters of Black creek, covers an area of about one square mile. The Radnor Paint Co. mined it around 1890 but the main production was taken up by the blast furnace operations at Les Petites Forges on the Mékinac-du-Sud river. The ore consists of spongy masses made up of hydrous ferric oxides, a little manganese and organic matter.

RIGAUD Seigniory, Vaudreuil-Soulanges county

Range III, lots 12-14

Ref.: 8, p.27.

Bog iron ore is said to occur on these lots.

ROY Township, Abitibi-East county

Point Mountain

Ref.: 4, 1885, p.31-D; 9, 1904, p.13.

Small deposits of ochre are present half way up the N.E. face of the mountain; the oxydes are probably derived from the decomposition of iron pyrites which are found in abundance further up. These deposits have little value as ochre.

STE ANNE Seigniory, Champlain county.

Parish of St. Adelphe, St. Emile range, lots 351, 36, 37, 727-729.

Ref.: 6 (P.E. Bourret, 1944; G.W. Waddington, 1945).

William Vennes produced ochre from these deposits from 1939 to 1951 under the name of Mauricy Oxide Company. The output was sold for the purification of coal gas. Two deposits were mine one of them measured 70' x 60' the other 150 feet distance measured 100' x 100'; the thickness was 2 to 3 feet of brown yellow to black ochre. The best parts of the deposits have been mined out.

Parish of Ste. Thècle, range B, lots 56, 57

Ref.: 1, 1885, p.104; 8, p.36; 6 (G.W. Waddington, 1945).

On the south shore of the small lake calle Paint Lake about half way between St. Tite and Ste. Thècle a deposit of ochre measures 50' x 12' and is about one foot thick. An analysis gave:

Fe_2O_3	63.5%
Insolubles	7.5%
MnO_2	1.04%
L.O.I.	26.3%

Parish of St. Prosper

Range IV, north of Ste. Anne River, lot 311

Ref.: 6 (G.W. Waddington, 1949).

A small ochre deposit 20' in diameter and 2 feet in thickness lies under a thin layer of peat and rests on sand.

ST. ETIENNE Seigniory

Des Forges Ranges

Ref.: 8, p.27; 6 (M. Boyer, 1931)

This seigniory was originally granted to Etienne Lafond in 1655; in 1737 it became the property of Les Forges du St. Maurice and the range Les Forges is the location of the first iron furnaces on the American continent. The ore to feed the furnaces came from various locations nearby.

In 1931, Montmorency Paint Products which had been successful in operating this type of deposit near Montmorency below Quebec, moved their equipment to St. Michel des Forges and continued to operate on a small scale for a few years. They mined a deposit at the foot of a hill which was about 400 feet long and of variable width and depth; the average depth was 12 inches.

ST. MAURICE Township, St. Maurice county

Range I, lots 7 to 11, 15 to 17

Ref.: 6 (P.E. Bourret, 1949; G.W. Waddington, 1953).

René Bégin produced ochre from a deposit on lot 15 from 1948 to 1951. This deposit was sampled by G.W. Waddington in 1949. It covers an area of about one acre, and has an average thickness of 11 feet; the average analysis of 28 samples was 72.11 per cent Fe_2O_3 and 13.34 per cent insolubles. The estimated reserves were calculated at 100,000 cubic feet of ochre.

On lot 7 to 11 Charles Girardin mined a deposit of ochre intermittently from 1936 to 1958.

SICOTTE Township, Gatineau county

Range I, lots 28-34

Ref.: 3, no.23, p.41

An ochre deposit is said to occur on these lots near Curtis lake half a mile east of the Gatineau river. There is no record of production.

SIMARD Township, Dubuc county

Range IV, lots 24-26

Range V, lots 26-28

Ref.: 1, 1884, p.92; 6,(P.E. Bourret, 1942; G.W. Waddington, 1948); 9, 1913, p.59; 8, p.36.

In a depression occupied by the N.W. arm of Rivière-des-Vases an ochre deposit occurs entirely under water. The area of mineralization measures some 40,000 square feet. Two samples taken by P.E. Bourret gave 57.16 and 60.40 per cent Fe respectively.

SIMPSON Township, Drummond county

Range II, lot 11

Range XII, lot 8

Ref.: 2, 1922, p.8; 8, pp. 25, 27.

The bog iron ores situated on these lots were used extensively to supply the blast furnaces of J.M. McDougall and Co. situated on the banks of the St. Francis River in Grantham township from 1880 to about 1905. Iron ochre occurs associated with the hard bog ore and the area is good prospecting ground for such deposits.

STANBRIDGE Township, Missisquoi county

Range VI, lot 13

Range VII, lot 27

Ref.: 8, p.27

These lots are mentioned as containing deposits of bog iron ore.

STANSTEAD Township, Stanstead county

Range III, lot 24

Range IX, lot 13

Range XI, lot 16 E½

Range XIII, lot 24

Ref.: 4, vol. IV, N.S. p.117K; 6 (R. DeBlois, 1959); 8, p.27; 11, p.25.

There are many occurrences of ochre and bog iron ore in Stanstead township. Some of them have been used locally to prepare paint for domestic use; no large scale exploitation has taken place.

STOKE Township, Richmond county

Range XIV, lot 12

Ref.: 4, vol. IV, N.S. p.117-K

A deposit of ochre of considerable area and of unknown thickness is said to occur on this lot. The colours are yellow and brown and the quality is said to be very good. Samples were taken at 3 feet in depth but did not reach the bottom of the bed.

TERREBONNE Seigniory, L'Assomption county

Near Hamlet of La Plaine and on lot belonging to Mr. Lancaster

Ref.: 4, 1851-52 and 1858.

A small quantity of yellow ochre occurs at the Hamlet of La Plaine and on a lot belonging to Mr. Lancaster in 1858, a bed of red ochre one foot thick rests on top of an eight foot bed of bog iron ore.

TREMBLAY Township, Dubuc county

Near Tributary of aux Bases River

Ref.: 4, 1883, J.C.K. Laflamme.

At the source of a tributary of aux Vases River, an ochre deposit 3 to 12 feet in thickness occupies an area some 2,300 feet long by about 1,000 feet wide. The ochre is rusty yellow at the surface but the lower strata are greenish-brown. There is little silica in the ore.

VAUDREUIL Seigniory, Vaudreuil county

Côte St. Charles, lots 16, 17

Ref.: 8, pp. 25, 36; 9, 1913, p.59; 11, p.18.

The ochre deposit is one foot thick and overlies a bed of bog iron ore which was one of the sources of iron for the furnaces J.M. McDougall & Co. near the St. Francis River in Drummond county. The ochre, when ground in oil, makes a good raw sienna paint which darkens on exposure.

VIGER Township, Rivière-du-Loup county

Ref.: 8, p.27.

This area is mentioned as containing a deposit of bog iron ore.

WENTWORTH Township, Argenteuil county

Ref.: 8, p.27.

J. Obalski mentions the occurrence of a bog iron ore deposit in the township.

WICKHAM Township, Drummond county

Ref.: 8, p.25.

Bog iron ore deposit in this township were a source of iron for the furnaces of J.M. McDougall & Co. near the St. Francis River.

WOLFE Township, Terrebonne county

Range VIII, lot 26

Ref.: 6 (P.E. Bourret, 1965)

In 1965, Theodule Levert did some work on an ochre deposit on this lot but there is no record of production.

YORK Township, Gaspé South county

Range II, lots 22 and 26

Ref.: 8, p.27.

Bog iron ore is said to occur on these lots.

SANDSTONE FOR BUILDING

Definition

What is called sandstone is usually a fine grained rock containing hard minerals such as quartz, feldspar and garnet. It is formed as all other sedimentary rocks by the transport and accumulation of erosion products, sand grains are gradually compacted and cemented by iron oxides, clay, calcite or quartz to form a sandstone.

Main properties

The value of sandstone as a building material is determined by its resistance to crushing, by the ease of extraction and dressing and by its appearance.

The resistance to crushing is greatly dependent on the cementing material, the colour and ease of dressing are also influenced by the same factor, a silica cement will give a hard and resistant stone which will be difficult to dress, calcite cement, on the other hand will give a stone easy to work but much less resistant and durable. Iron oxides are mainly responsible for colour, their cementing action is intermediary between quartz and calcite. Sandstones with clay cements are unattractive and their resistance to crushing is poor.

Porosity

Porosity is an important factor in sandstones, these rocks tend to be more porous than others and thus are more subject to deterioration

in our rigourous climate. That is why it is usually recommended to let the stones dry for a few months after they have been quarried; if the stone can rid itself sufficiently of pore water leaving about 10 per cent of open space, no injury should occur due to freezing. The subcapillary openings will probably be enlarged after the first few freezing cycles leaving sufficient open space to take care of expansion due to freezing.

Production

Sandstone for building and monuments has never been an important item in the tables of mineral production in Quebec. The best year was 1935 when 8,000 tons were produced, since then, there were many years when the quarries were idle and most often the annual production was less than 1,500 tons. Domestic sandstones have never been used for large constructions because the deposits are rarely capable of furnishing stones of uniform colour and texture in great quantity and it is usually difficult to extract blocks of large enough dimensions; most deposits were worked to supply the local market and the stones were used mainly in residential construction. For the latter purpose they constitute an ideal stone, very attractive, sufficiently resistant and available at many places especially in the Paleozoic formations of the St. Lawrence Lowlands.

PRINCIPAL REFERENCES

(1) Canada Dept. of Mines, Mines Branch, Publ. no.

(2) Mining Operations of the Province of Quebec.

(3) Office files

(4) Department of Natural Resources, Quebec, P.R. no.

(5) Bureau of Mines, Quebec, Geol. Report no.

(6) Mines & Minerals of the Province of Quebec, by J. Obalski 1889-1890

(7) Department of Energy Mines and Resources, Mines Branch, Ottawa, Investigatigation Report no.

LIST OF OCCURRENCES

ARMAGH Township, Bellechasse county

Ref.: 2, 1921, p.97.

Sillery sandstones were extracted at St. Raphaël and Armagh in the early part of this century.

AWANTJISH Township, Matapedia county

Range I, lot 18

Ref.: 5, no 9, p.38.

On this lot there are "outcrops of rose coloured very fine grained sandstone that would furnish excellent stone for construction". Near St. Cleophas, in the northern part of the township, sandstone slabs have been used by farmers to make foundations for barns and for patios; the latter sandstone is grey with bluish or greenish tints.

BEAUHARNOIS Seigniory, Beauharnois county

Ref.: 1, no. 279, p.121.

Some sandstone was quarried for building purposes west of the village of Beauharnois. A four foot bed of solid stone is present 6.5 feet below surface layers of flinty stone. More recently, these quarries have been worked as silica deposits and no attempt was made to extract large blocks for building purposes.

BEDARD Township, Rimouski county

Range V, near St. Guy

Ref.: 4, no. 493, p.8

Silurian sandstones of the Robitaille formation outcrop abundantly near St. Guy; a few houses and one hotel was built with this stone in the village of Lac des Aigles. Quarrying is difficult because of the scarcity of joints.

CABOT Township, Matapedia county

Lot 52, range N.E. of Matapedia Road.

Ref.: 3, O.D. Maurice, 1955; 5, no. 9, p.38.

The church of St. Moïse was built in 1914 with a gray sandstone from a quarry less than a mile north of the village. The stone is very hard making it difficult to quarry economically.

CASUPSCULL Township, Matapedia county

Range I, lots 24, 25.

Ref.: 1, no. 279, p.135; 3, (O.D. Maurice, 1955).

A very attractive brown stone, fine grained and uniform in colour, was quarried at this location in the early part of the century. It was used in buildings in Montreal and in small construction in the Matapedia Valley. At one time, 200 men were employed in this quarry.

GUIGUES Township, Temiscaming county

Range I, lots 18-20.

Ref.: 1, 279, p.132; 2, 1910, p.75; 3 (O.D. Maurice, 1955).

Mr. Ed. Wright of Hailebury opened a quarry at this location on the shore of lake Temiscaming in 1909; the stone was used for building the Presbyterian Church at Hailebury, Ontario.

The stone is very porous and contains a high percentage of dolomitic limestone; the presence of ferrous oxides would cause the stone to be spotted with rusty patches and stringers after being exposed to the weather.

LAUZON Seigniory, Levis county

Parish of St. Jean Chrysostome

Ref.: 1, no. 279, p.124; 3 (O.D. Maurice, 1955); 6, p.154.

This greenish sandstone belonging to the Sillery formation has been quarried extensively for building purposes beginning in the 1880's. One quarry was located about one mile south of the church of St. David and others existed in the general vicinity, notably at St. Joseph de Levis.

Some old buildings in Quebec and on the south shore were built in whole or in part with this stone: the church of St. David, the college of Levis, the basement of the parliament buidings in Quebec, the forts at Levis. For many years, the quarries have yielded only crushed stone for aggregate.

LAVERLOCHERE Township, Temiscaming county

Range I, lots 19, 20-A

Ref.: 3 (P.E. Bourret, 1958).

A greenish-gray quartzite has been uncovered over a length of 150 feet and a width of 50 feet. The beds are flat lying and may be separated easily to give flagstones of large dimensions. The stone is very hard, the joints are well separated and vertical. A small production was reported by Bearn Quarry Ltd. in 1956-57.

LEPAGE & THIBIERGE Seigniory, Matapedia county.

At Grand Remous on the Metis River

Ref.: 3, (O.D. Maurice, 1955); 5, no. 9, p.37.

The church at St. Angèle was built with sandstone from a quarry situated on the east bank of the Metis River about 3 miles N.W. of St. Angèle. The stone is coarse grained, very hard and contains numerous grains and veinlets of pyrite which makes it quite unsuitable as a building stone. In addition to the church at St. Angèle, the stone was used in the piers of the railroad bridge over the Metis River.

L'ISLET Seigniory, l'Islet county

Two miles below l'Islet

Ref.: 1, 279,p.126; 3, (O.D. Maurice, 1955).

The sandstones which outcrop at many places along the St. Lawrence River have been quarried near l'Islet to build the church and school at this locality. At least three varieties of sandstone are present, the most abundant being grayish-green, but red and purple varieties are also available.

MANN Township, Bonaventure county

Range I, lot 1

Ref.: 1, 279, p.136; 3 (O.D. Maurice, 1955).

Devonian sandstones outcrop near Pointe-à-Boudreau in Chaleur Bay apposite Campbelton, N.B. The stone is olive green, medium grained, the quartz and feldspar grains are cemented with argilaceous cement and ferrous iron accounts for more than three per cent of the rock which makes it susceptible to staining when exposed to the atmosphere. The stone was used in the building of the church at Mission Point apposite Restigouche.

MURRAY BAY Seigniory, Charlevoix county.

At Pointe-au-Pic near the wharf and at Cap-à-l'Aigle.

Ref.: 1, 279, pp. 128-132; 3, (D.D. Maurice, 1955); 6, p.154.

Sandstone beds with quartz grains cemented by calcite occur at the base of the Trenton formation in the Malbaie area; this sandstone has been used to build the church at la Malbaie and for the front of the Quebec Court House; Adjutor Simard has been operating a quarry at Pointe-au-Pic since 1937, for a number of years he has produced crushed stone exclusively. The stone varies greatly in texture and colour from one location

to another, it is generally quite durable judging by the buildings mentioned above which are almost one hundred years old.

NICHOLAS RIOUX Seigniory, Rimouski county.

Parish of St. Mathieu, lots 174, 176, 177 N.W. ½, 158, 359, 360.

Ref.: 3 (O.D. Maurice, 1965); (P.E. Bourret, 1964, R. Sirois, 1966); 7, no. 66-75.

Near the shore of Lake Simon, two quarries have been reopened recently to furnish stone for residential construction. The quarry on lots 176-177 N.W.½ is operated by Real Dionne since 1966, the beds in this quarry are generally less than 6 inches thick. Some stone is also taken from lot 174 where the beds are up 5 feet in thickness. There are several varieties of stone, gray, rose and brick red in colour; the grain is medium to coarse. The stone has been used for residences and two monuments in the Village of St. Mathieu.

The other quarry on lots 158, 359, 360 was opened around 1965 by Elzéar Gagnon who sold a small quantity for residential purposes. This is an older quarry which has furnished the stone for the churches of St. Mathieu and Ste. Françoise and for the piers of a railroad bridge over the Trois-Pistoles River. The stone is quite durable judging by the negative effect of weather on the older buildings. In appearance, it is similar to that of the other quarry described above. Samples of this stone were submitted to the laboratories of the Mines Branch in Ottawa and the stone was found to be of good quality and of pleasing appearance.

PETITE NATION Seigniory, Papineau county

St. Angelique Parish, lot 67

Ref.: 1, 279, p.121; 3 (O.D. Maurice, 1955).

The sandstone quarries between Papineauville and Montebello have been active at various intervals for more than 100 years; some old buildings of the parliament in Ottawa were built with this stone. On lot 67, Alfred Bissonnette then Willie Poirier furnished stone for residences in Montreal, Sherbrooke and Three Rivers between 1946 and 1957. The stone is fine grained, the rounded quartz particles are cement by iron oxides which give the stone attractive colours of red, green and gray. After exposure to weather, the stone assumes a uniform gray colour. The church and presbytary at Montebello are good examples of utilization.

ST. MICHEL Seigniory, Bellechasse county

At St. Raphael

Ref.: 2, 1921, p.97.

Sillery sandstone has been quarried here in the early part of the century.

ST. ROCH DES AULNAIES Seigniory, L'Islet county

Parish of Ste. Louise, lots 304-314

Ref.: 3, (P.E. Bourret, 1961).

In 1961, Mr. Paul Marier opened a quarry on these lots to obtain stone for building his residence at Ste. Louise. The quarry is a short distance north of Lac-des-Prairies. The stone is medium to fine grained, rose to grey in colour and is quite suitable for small constructions.

SILLERY Seigniory, Quebec county

Parish of Ste. Foy, lot 320

Ref.: 1, 279, p.126; 3 (O.D. Maurice, 1955).

This quarry which was operated by Jean Vezina until 1932, furnished stone for many old buildings in Quebec notably the walls of the Citadel, the base of the Parliament building. St. Mathews Anglican church and some parts of the Chateau Frontenac. The stone, as elsewhere in the Sillery formation, is fine to medium grained, greenish, hard and durable.

QUARTZ AND SILICA SAND

The mineral quartz (SiO_2) is one of the most common in the earth's crust; it is an essential constituant of many igneous and sedimentary rocks, it occurs very often in pure six sided crystals which are used extensively for many industrial applications such as in electric and optical equipment; it occurs also in great masses such as veins, dykes, and whole sedimentary formations very often in pure enough form to be used without beneficiation in industry. The mineral is hard and resistant to the forces of erosion and is likely to be left behind on beaches and elsewhere when the other constituents of the rock are broken down and carried away in solution or suspension.

This chapter is concerned only with the deposits of industrial quartz which are able to furnish the enormous requirements of industry; the list of known occurrences of commercial grade silica or quartz will include first the consolidated deposits such as sandstones, quartzites or veins and the unconsolidated natural quartz sands that are met on beaches recent or old, fload plains, or in deposits left behind by the melting glacier.

Silica is not an expensive commodity and the possibility of working a deposit economically is often linked to its distance from the consuming center. However, water transport is cheaper and some deposits lying close to main water ways can sometimes compete with deposits closer at band especially if the product is pure and beneficiation less expensive.

Uses of silica

Silica has many uses which are related to the particular properties of the mineral quartz. It is a hard mineral therefore it is used extensively as abrasive in sand blasting, glass grinding or stone sawing. It is obtainable in very pure form and when melted with various other ingredients gives a transparent glass. The silicon in quartz may combine with various other elements to give useful products such as sodium silicates or silicon carbide. In Canada, the main consumption of silica is in the smelting of base metal ores where it is used as a flux forming a slag containing iron and basic oxyde impurities. The manufacture of ferrosilicon and other alloys is also an important outlet for silica. All these uses require a more or less pure silica, varying in size from coarse to very fine but one of the main qualities is that the product be quite uniform in composition. The producer of silica who wants to serve many different industries must be equiped to furnish silica of many sizes, and must be able to beneficiate his product to the highest degree of purity. Following are a few specifications for some of the main uses.

Glass

Size should vary from minus 30 mesh to plus 100 mesh; 2 per cent minus 100 mesh is tolerated. Fe_2O_3 content should not exceed 0.02 per cent for high quality flint glass, one per cent Fe_2O_3 is tolerated for dark coloured, MgO + CaO may vary from 0.1 to 0.5 per cent from high to low quality; alkalis should be very low. Uniformity of composition is very desirable.

Ferrosilicon

Lump silica is required from 3/8" to 5", the shapp is not significant, Fe_2O_3, Al_2O_3 and MgO + CaO should not be more than 0.2 or 0.3 per cent. Phosphorous and arsenic form dangerous toxic gazes. Larger quantities of impurities can be tolerated if present in uniform quantities.

Silicon Carbide

The size should vary from 20 to 100 mesh. Fe_2O_3 and Al_2O_3 should be kept under 0.1 to 0.2 per cent. Phosphorous, lime and magnesia should be absent.

Foundry sand

The size should vary from 30 to 140 mesh 90 per cent should be from 40 to 100 mesh. The shape is significant for some not critical for others. Does not require a high purity silica but the latter is preferred.

Metallurgical Flux

The size should be minus 5/16". Fe_2O_3, Al_2O_3 and other impurities should be uniform but not necessarily very low.

Reduction of Phosphate Rock

The material should pass a screen of 1¼ inch and not more than 5% should be minus 1/4". Fe_2O_3 and Al_2O_3 are tolerated to a limit of 1.5 per cent, MgO and CaO should not exceed 0.2 per cent. Opaline silica is undesirable.

Sodium Silicate

The size should vary from minus 20 mesh to plus 100 mesh. The purity should be the same as that for flint glass that is limits of 0.02 per cent Fe_2O_3, 0.2 per cent Al_2O_3, 0.05 per cent MgO - CaO and 0.01 per cent alkalies.

Refractory use:

The size should be 100 per cent minus 100 mesh, the impurities should be limited to 0.2 to 0.4 per cent Fe_2O_3, 0.4 per cent Al_2O_3, 1.0 per cent MgO - CaO and 0.5 per cent alkalies. Opaline silica is undesirable.

Silica Brick

The size should be minus 8 mesh, 1.5 per cent Fe_2O_3 is tolerated, Al_2O_3 should not exceed 0.1 per cent, other impurities should be low.

Abrasives

The size should vary from minus 4 mesh to plus 100 mesh, round grains are preferred for some uses, angular grains for others, the material should be relatively pure avoiding adhering clay or coatings, flat or soft particles.

Aggregates

The color is the most important feature; white is preferred but other colours may also be in demand.

Of all those uses, four are outstanding because they represent more than half of the consumption of high grade silica in Quebec; these are glass, silicon carbide, ferro silicon and reduction of phosphate rock.

Indusmin produces glass sand at the St. Canut plant; the mineral comes from two quarries situated at St. Canut and St. Donat respectively; it is presently the only producer of this commodity in Quebec and is able to fill the requirements of the glass industry in the province. The average yearly consumption of silica in the glass plants of Quebec is less than 150,000 tons, how much of this sand is produced in Quebec and how much is imported is not exactly known but it is noted that the production of glass sand has increased notably in recent years equalizing if not exceeding the consumption.

Silicon carbide is manufactured in three plants near Trois-Rivières, Quebec; the average yearly requirement of silica for these plants is 70,000 to 80,000 tons. Indusmin supplies these manufactures with silica from the quarries at St. Donat and St. Canut; little silica is imported into Quebec for that purpose.

Union Carbide (Canada) Company Limited produces ferrosilicon in two plants situated in Beauharnois and Chicoutimi, Quebec; it operates a quarry near Beauharnois and buys part of its requirements from E. Montpetit near Beauharnois and Baskatong Quartz Company near Mont Laurier.

Electric Reduction Company of Canada Limited utilizes an important quantity of silica in a plant situated at Varennes, Quebec.

The silica serves as a reducing agent in the production of phosphorous and comes from a quarry operated by Armand Sicotte in the parish of St. Malachie in Beauharnois county.

Prices

Silica of the highest purity sells for about $10.00 per ton in the vicinity of Montreal; much less is paid for silica containing appreciable amounts of impurities. Quartz particles of various sizes used in the manufacture of artificial stones commands prices of up to $30.00 per ton especially when the material is white. Since silica is not generally a very expensive commodity, it cannot suffer long distances of transportation especially by road or rail; many known deposits are not economical at the present time because of their remoteness from the consuming centers.

The following list includes all the known deposits of silica although it must be realized that many of these are not economical for various reasons but mostly because there is no consumer nearby, they could become economical if a consuming plant were built in the vicinity or if dock facilities were built to permit water transportation or in various other circumstances.

Principal References

(1) Canada Dept. of Mines, Mines Branch no.

(2) Mining Industry of the Province of Quebec.

(3) Mining Operations in the Province of Quebec.

(4) Quebec Department of Natural Resources, office files.

(5) Quebec Department of Mines, Preliminary Report.

(6) Quebec Department of Mines, Geological Report.

(7) Department of Mines and Resources, Ottawa, Mineral Dressing and Metallurgical Laboratories.

(8) Geological Survey of Canada, Memoir no.

(9) Department of Mines and Technical Surveys, Ottawa, Mines Branch, Investigation Report no.

(10) Geological Survey of Canada, Report of Progress.

(11) Quebec Bureau of Mines, Annual Report.

(12) Quebec Dept. of Natural Resources, Inspection Reports.

LIST OF OCCURRENCES

AMHERST Township, Papineau county.

Range VIS, lots 4, 5, 6 and 12

Ref.: 1, no. 555 pp. 55-57; 2, 1947, p.49; 3, 1922, p.82; 3, 1923, p.66; 4, P.E. Bourret, 1934, 1937, 1948, 1958; O.-D. Maurice, 1969.

Mining of these kaoliniferreous quartzites started in 1912 and was continued more or less actively until 1958. The main operators were Canadian Kaolin Silica Products Limited from 1930 to 1942 and Canada China Clay and Silica Ltd. from 1942 to 1948. During these years, 11,898 tons of kaolin and 642,921 tons of silica were produced. From 1952 to 1958, Laurentian Silica Mines Co. Ltd. became the owner of the deposit on lot 12 S½ (mining concession no. 294) and sold about 90,000 tons of silica to Canadian Cement in Montreal; this silica came mostly from rejects of previous operations. In 1967, mining concessions 92, 93 and 294 which included these silica deposits, were reworked and were later staked by Germain Drouin of Huberdeau.

The deposits extend over a length of 8,000 feet across lots 2 to 12, range VI south, the width may reach several hundred feet at places; kaolin is always present in the rock or in veins a few feet to over one hundred feet wide. On lots 5 and 6 the ore was mined by open pit and underground methods; most of the silica come from an open pit on lot 12. The opening measures 600 feet long, 200 feet wide and is 100 feet deep.

L.H. Cole gives the following analyses of the ore unwashed and washed. The granulometric analyses is after crushing until the whole sample passed through an 8 mesh screen; this is true of all the other analyses reported by L.H. Cole and reproduced in this report.

GRANULOMETRIC			CHEMICAL		
Mesh	Unwashed	Washed		Unwashed	Washed
Retained on 10	18.50	--	SiO_2	96.30	99.09
14	15.30	--	Fe_2O_3	0.46	0.32
20	13.40	--	Al_2O_3	1.49	0.12
28	13.20	3.72	CaO	0.20	0.09
35	8.40	3.57	MgO	tr.	tr.
48	7.30	12.70	L.O.I.	1.10	0.20
65	6.43	24.93	Total	99.55	99.82
100	5.25	33.07			
150	1.70	8.22			
200	3.82	12.07			
through 200	6.70	1.72			

Range VIII, lots 28 to 31

Ref.: 4, P.E. Bourret, 1965; 4, O.D. Maurice, 1965.

Pure translucid quartzite is said to exist on these lots. The deposit was prospected around 1965 by Tremblay Marble and Granite Quarries Limited who intended to use the material in pre-cast concrete blocks.

ARUNDEL Township, Argenteuil county.

Range VII, lots 25-28

Range VIII, lots 25-30

Ref.: 2, 1950, p.36; 4 (P.E. Bourret, 1950, 1951)

This deposit is similar to that of St. Remi d'Amherst in that kaolin occurs as a filling between quartz grains and as pockets and lenses in fracture plains. The quartzite is granular and highly shattered, it is generally gray in colour; most of the deposit is drift covered.

Twelve shallow holes were drilled in 1969 by J.M. Huber of Georgia on lots 26 to 28, range VII, owned by G. Drouin. The purpose was to prove a deposit of kaolin but little of that mineral was intersected. The deposit could be of economic interest as a source of silica rather than kaolin; until now, only the latter mineral has attracted attention.

AWANTJISH Township, Matapedia county

Range I, lots 15-22

Range III, lots 4-13

Ref.: 5, no.430, p.14.

The Val Brillant quartzite formation of Silurian age crosses this township in a direction about east-west. Some of these quartzites could possibly be used as a source of silica and they offer the advantage of being near the St. Lawrence River about 12 to 30 miles from the dock of Pointe-au-Père. A 21 pound sample collected by J. Béland from range I, Awantjish township gave the following analysis.

SiO_2 . . . 98.7%	$CaCO_3$ . . . nil	$MgCO_3$ . . . nil
Fe_2O_3 . . . 0.31%	Al_2O_3 . . . 0.26%	S . . . 0.01%

BARIL Township, Laviolette county

About 7 miles from the confluence of the Wessonneau and St. Maurice rivers

Ref.: 4 (M. Boyer) 1933.

A pegmatite dyke some 200 feet wide and of unknown length; about three quarters of the dyke is clear quartz.

BASKATONG Township, Gatineau county.

Range VIII, lots 3, 4B, 5, 6.

Ref.: 4, A. Deland, 1962; 4, P.E. Bourret, 1961; 4, O.D. Maurice, 1966; 6, no.23, pp. 53-55; 7, I.R. no 2339.

This silica deposit is located in the west half of lots 3 and 4, range VIII, within the limits of mining concessions nos 475 and 487 granted in 1961 and 1962 respectively.

This "White Mountain" as it is known was staked on several occasions from 1941 but it became better known after the report by Aubert de la Rue in 1948. About that time, George Loucks of Dolgeville, N.Y. staked the claims on behalf of Forbes D. Mutchler and others of Ibion, New York. Samples were collected and sent to the Mineral Dressing and Metallurgical Laboratories in Ottawa. From 1957 to 1961 a small amount of work was done by J.W. Yates who had acquired the mining rights on the deposit.

The first beneficiary of mining concession no. 475 was Baskatong Mining Corporation. The mining rights were later transferred to Auley Mines Ltd. and five other companies, and the deposit was mined during a short period by International Minerals & Chemical Corp. Ltd. Since 1962, the operator is Baskatong Quartz Products and there has been some production each year.

The quartz deposit is an enormous lens some 600 feet long striking about north-south, the maximum width is at least 300 feet. It is worked from benches some twenty feet high from the shore of Philomène Bay in Lake Baskatong.

The quartz is very pure, very white and very hard, it is used mostly as aggregate in ornemental pre-cast concrete blocks and for the manufacture of ferrosilicon.

Aubert de la Rue gives the results of six samples taken every hundred feet along the length of the deposit. The following table reproduces these results and gives a granulometric analysis made on a twenty pound sample passing through a 20 mesh screen, the latter analysis was calculated from ref. 7, I.R. no 2339, p.3.

GRANULOMETRIC		CHEMICAL			
Mesh	Unwashed sand		SiO_2	Fe_2O_3	TiO_2
Retained on 20	0.13	1	99.93	tr.	nil
28	10.75	2	99.93	tr.	nil
35	21.20	3	99.95	tr.	nil
48	17.30	4	99.88	0.06	nil
65	12.52	5	99.74	0.06	nil
100	9.02	6	99.67	0.07	nil
through 100	29.08				
total	100.00				

BEAUHARNOIS Seigniory, Beauharnois county

Ref.: 6, nos 46 and 122; 8, no. 241, p.13.

The Beauharnois Seigniory covers a great part of both Chateauguay and Beauharnois counties, it is underlain completely by rocks of Cambrian and Ordovician age. T.H. Clark (ref. 6, no. 122) has described the stratigraphy in this area and has recognized several formations of which the Cairnside of upper Cambrian age would be the most suitable for obtaining silica useful to the industry. It is made up of a gray-white stone, in thin beds almost horizontal, and the rocks are pure orthoquartzites with siliceous cements in general. Feldspar crystals are rare.

All the areas which have produced silica in Chateauguay county lie in the Cairnside formation, those of Beauharnois county lie north of the Chateauguay area and of map 1569 by T.H. Clark published in 1966 by the Department of Natural Resources. When mapping the Montreal area, Lachine sheet (map 801, Quebec, Dept. of Mines, 1952); T.H. Clark used the name of Marsh formation for the sandstone beds lying near Melochville and which have been extensively quarried for silica. The term Marsh was originally used by A.E. Wilson (ref. 8) to describe transitional beds lying between the Potsdam sandstone and the Beekmantown dolomites. Near Melochville, these beds are highly siliceous and are very similar in composition to those of the Cairnside formation described by Clark in the Chateauguay area to the south. The revised unpublished map of the area shows the region around Melochville and Beauharnois to be underlain by Potsdam sandstone.

These silica rich beds cover an extensive area just south of the St. Lawrence near Montreal, they could represent important reserves especially for industries that do not require rigid specifications as to the content of impurities.

Ranges I and II, lots 302, 303, 307, 308, 310, 399-405 and near the town of Beauharnois.

Ref.: 1, no.555, p.53; 4, P.E. Bourret, 1946, 1963; 4, O.D. Maurice, 1967; 9, nos. 64-70, 65-5.

The first reports of activity in this area date back to 1922 but the first quarrying probably took place before that time since L.H. Cole (ref. 1) mentions in 1923 the presence of many quarries near Melocheville, the most important being that of Consolidated Sand & Supply Co. Ltd. Euclide Montpetit started to operate a quarry on lot 301, in 1926 and worked this quarry almost continuously until 1946. From 1964, E. Montpetit & Sons Ltd. obtained a mining concession (no. 509) on lots 305 to 308 and from then on, the quarrying was done from this property.

The quarry of Union Carbide on lots 400 and 401 was opened in 1944 by St. Lawrence Alloys and Metals who operated there for about ten years; from 1954 to 1959 a subsidiary of Union Carbide Co. called Electro-Metallurgical Co. operated the quarry until Union Carbide took over the operations and continued them until now without hardly any interruption. Mining concession no. 530 covering lots 400, 401, 402 and 405 was granted to the company in 1966.

In earlier days, the production of silica served partly for the glass industry but for a number of years almost all has been consumed by manufacturers of ferrosilicon. Following are some analyses taken from different sources.

Chemical Analyses

	1	2		3		4
		Washed	Unwashed	Unwashed	washed	Unwashed
SiO_2	97.82	97.08	98.24	98.07	98.80	97.48
Fe_2O_3	0.50	0.39	0.64	0.35	0.12	0.60
Al_2O_3	0.61	0.55	0.50	0.10	0.18	0.26
CaO	0.30	0.13	tr.	0.03	--	0.48
MgO	0.52	0.20	0.32	0.27	--	0.41
L.O.I.		0.31	0.32	0.32	0.40	0.44

1 - Analysis from the Montpetit quarry furnished by the buyers in 1955.

2 - From reference 1, old quarry of Consolidated Sand and Supply Co. Ltd. east of Melocheville.

3 - From reference 1, old quarry west of the town of Beauharnois operated by Wm. Robert.

4 - Same as 3.

Investigations on this material in the laboratories of the Mines Branch in Ottawa have shown that it can be upgraded to 0.07 per cent Fe_2O_3 by scrubling and washing and high intensity magnetic separation; the iron remaining is in extremely fine pyrite particles which cling to the quartz pebbles.

Following are granulometric analyses taken from reference 1, on samples 2, 3 and 4, above, after crushing to pass an 8 mesh screen.

	2		3		4	
Mesh	Unwashed	Washed	Unwashed	Washed	Unwashed	Washed
Retained on 10	--	--	--	--	--	0.30
14	--	0.25	--	--	2.15	3.35
20	2.93	3.80	2.07	1.34	4.61	6.76
28	10.68	12.70	11.92	5.60	4.75	4.70
35	14.35	34.85	15.39	16.50	9.95	13.35
48	29.44	38.85	23.90	28.06	19.05	27.05
65	22.74	21.80	18.28	22.35	17.27	22.95
100	11.48	8.40	14.22	19.76	18.50	19.25
150	1.96	0.75	2.92	3.69	4.30	1.60
200	3.49	0.30	4.65	2.65	7.35	0.65
through 200	2.93	0.05	6.65	0.05	12.07	0.15

BEAUHARNOIS Seigniory, Chateauguay county

Range VI, lots 430 to 444, Parish of St. Jean Chrysostome

Range VI, lot 1142, Parish of St. Malachie

Range VI, lots 1193, 1195, Parish of St. Malachie

Ref.: 1, no.555, p.51; 4, P.E. Bourret, 1956, 1962; 4, O.D. Maurice, 1967.

Electric Reduction Co. of Canada opened a quarry in 1953 on the property of Adolphe Schink of Howick. Later, the quarrying was done by Wm. Wallingford and Armand Sicotte; today, Armand Sicotte & Sons are the sole operators and their production is sold entirely to Electric Reduction Co. of Canada Ltd. who use it at Varenne for the reduction of phosphatic rocks. The fines are generally sold to Canada Cement.

There are three quarries on lots 439, 440 and 1142 respectively. The sandstone is medium grained, quite compact and grey to buff in colour.

Following are a few chemical analyses of the rock from these quarries and vicinity.

	2	3	4	5	
				Washed	Unwashed
SiO_2	97.95	99.25	99.07	97.82	96.56
Fe_2O_3	0.15	0.10	0.03	0.10	0.29
Al_2O_3	0.70	0.12	0.33	1.00	0.90
MnO	0.00	0.00	--	--	--
CaO	0.00	0.00	0.03	0.10	0.10
MgO	0.10	0.08	0.02	0.04	0.12
L.O.I.	0.26	0.14	--	0.28	0.19

Sample 2: from quarry on lot 439

3: same as 2

4: Analysis furnished by the buyers in 1955

5: Analysis taken from ref. 1, representing sample collected on lot 1193 or 1195, range VI.

L.H. Cole gives a granulometric analysis of sample 5 after crushing to pass on 8 mesh screen.

Granulometric Analysis

Sample 5

Mesh	Unwashed	Washed
Retained on 10	--	--
14	--	--
20	3.20	1.96
28	15.28	10.61
35	13.87	18.15
48	17.58	21.40
65	14.63	17.54
100	19.27	25.06
150	5.12	4.71
200	5.87	0.51
through 200	5.08	0.06

Range II, lots 1118-1122, Parish of Ste. Clothilde

Ref.: 4, (P.E. Bourret, 1956)

Radius Exploration Ltd. did some exploration work on some quarrying on these lots between 1955 and 1957; the total production was 8715 tons valued at $17,196. In 1961 and 1962, Moulin Silice et Brique Ltée mined the deposit on a royalty basis and produced 1642 tons valued at $6,568. The product was used mainly as an ingredient in Siporex, a cellular product made with silica, lime or cement and aluminum powder.

Range III, lots 1173-1176, parish of Ste. Clothilde

Ref.: 4 (P.E. Bourret, 1964, T. Salman 1964, 1965, 1966); 9, I.R. 65-82, Sept. 1965, by R.K. Collings.

In 1956, a hole was drilled on this property to a depth of 40 feet by Silica Company of Quebec Ltd. In 1964, En Ola Exploration acquired the property and did some exploration and testing. Nine diamond drill holes were drilled in 1965 to a depth of 50 feet and one to a depth of 500 feet, the average analysis of the core in each hole was reported as follows:

Hole No.	SiO_2	Fe_2O_3	Al_2O_3	L.O.I.
1	95.54	0.21	0.41	1.37
2	97.19	0.17	0.25	0.81
3	97.10	0.13	0.32	0.80
4	95.97	0.16	0.41	1.11
5	94.89	0.17	0.25	1.58
6	95.63	0.21	0.41	1.25
7	95.85	0.21	0.45	1.09
8	95.79	0.19	0.46	1.29
9	97.41	0.19	0.36	0.72
10	97.51	0.12	0.31	0.64

The drilling covered an area 1250 feet long and 750 feet wide and the tonnage of silica proved was of the order of 7,735,000 tons.

Investigations at the Mines Branch have shown that the product can be beneficiated by electrostatic separation. Other tests have shown that the impurities are mostly in the fine portion after grinding and that a greatly improved product is obtained by simply discarding the slimes.

In 1966, Vitroc Sandstone Corporation did some work on the property with the object of preparing a quarry to produce building stone; no activity has been reported since then.

BEAUPORT Seigniory, Montmorency county.
St. Ignace range, lot 100°SE
Ref.: 4 (R. Laliberté, 1961, 1963).

A quartzite band some 600 feet long and 100 feet wide was prospected in 1961 and 1963 by Les Mines Laval Compagnies Ltée. Four diamond drill holes totaling 571 feet intersected quartzites with mica and hornblende as the main impurities; some sections were very pure quartz.

BERGERONNES Township, Saguenay county.
Near Lac-des-Sables and Lac-des-Grandes-Bergeronnes
Ref.: 4 (L. Germain, 1953).

The pegmatite dykes containing muscovite have also attracted the attention of mining concerns for their content of quartz. Strategic Metals held several claims in this area around 1953 and did some development work on the dykes; no production was recorded.

BLAIS Township, Matapedia county.

Range IV, lots 45-47

Ref.: 5, no. 465, p.13.

The Val Brillant sandstone exposed on these lots is composed almost entirely of quartz and may be suitable for silica extraction.

BOURBONNAIS Township, Pontiac county

One mile west of mile 18 on county line

Ref.: 4 (P.E. Bourret, 1938).

A pegmatite dyke is exposed over a length of 300 feet and a width of 20 feet. Clear vitreous quartz suitable for the production of fused quartz occurs in the pegmatite. International Crystal Company held a claim at this point around 1938 but apparently did very little work on the prospect.

BRASSARD Township, Berthier county.

Range I, lots 12-14

Range II, lots 11-16

Ref.: 4 (O.D. Maurice, 1965); 5, no. 552, p.13.

Superior Silica Mines Ltd. drilled 14 holes totalling 1744 feet in 1964 on a quartz lens situated in range I near the boundary of lots 12 and 13; the deposit outlined by the drilling measures 180 feet in length 70 feet in average width and 56 feet deep. The total tonnage calculated would be 28,200 tons. In 1966, 500 tons of this material was sold to a manufacturer of artificial stone who used it as an exterior decorative coating.

BUCKINGHAM Township, Papineau county.

Several pegmatite dykes in Buckingham township which have been mined principally for feldspar also contain quartz in appreciable amount; where this quartz occurs in separate pockets it is recoverable and is often of very high grade.

Range VI, lot 23 N½

Ref.: 1, no. 731, p.66; 4 (M. Bayer, 1930).

Ottawa Valley Mines Ltd. shipped a few tons of quartz to Electric Reduction Co. at Buckingham in 1930.

Range VII, lots 19 B and 21 S½

Ref.: 4 (P.E. Bourret, 1954, M. Bayer, 1930).

These pegmatite dykes contain an appreciable amount of quartz. Lot 19 B was worked around 1954 by Joseph Martin and lot 21 S½ in 1930 by J.B. Gauthier.

Range VIII, lot 8

Ref.: 4 (P.E. Bourret, 1954)

In 1949-50, Claude Pigeon extracted about 20 tons of quartz from this deposit; the pegmatite dyke is exposed over a length of 75 feet and a width of 20 feet; the center of the dyke contains a mass of quartz some 55 feet long.

Range VIII, lot 27

Ref.: 4 (P.E. Bourret, 1952)

This deposit was worked for quartz and feldspar by Bon Ami Ltd. in 1940.

Range IX, lot 11

Ref.: 1, no. 731, p.66.

In 1922, feldspar and quartz were mined from a deposit on this lot by J. Cameron.

Range IX, lot 16

Ref.: 4 (P.E. Bourret, 1942)

United Mining Industries mined feldspar and quartz from this deposit from 1941 to 1946; the quartz was sold to Electric Reduction Co. in Buckingham. The pegmatite contains large pockets of quartz and feldspar.

Range X, lot 8

Ref.: 1, no. 731, p.67.

This deposit was mined for quartz in the twenties.

Range X, lot 28 A

Ref.: 4 (A.J. Hough, 1958)

Three dykes were explored by the Templeton Development Co. in 1952 and 1957; one of these contains 10 per cent of clear quartz.

Range XI, lot 16

Ref.: 2, 1945, p.44.

A quartzite occurring on this lot was quarried in 1945 by William Hill; the product was used as pebbles in a grinding mill operated by the Canadian Flint and Spar Company at Buckingham.

Range XII, lots 12 and 13

Ref.: 4 (A. Deland, 1957).

A pegmatite dyke some 400 feet long and 50 feet maximum width contains 35 per cent quartz in lenticular masses; it was worked in 1957 by Adéodat Malette.

Range XII, lot 14 ½E

Ref.: 1, no. 731, p.68; 4 (P.E. Bourret, 1938).

This is one of the better known feldspar deposits in the Buckingham area the Pednaud Feldspar Property. It was mined intermittently from 1910 to 1961 by various operators who produced quartz as well as feldspar. Electric Reduction Co. of Buckingham was a good client for the quartz.

CHARLEVOIX County.

West of Lacoste township

Ref.: 4 (P.E. Bourret, 1964; O.D. Maurice, 1966)

This quartz deposit has been prospected since 1946 and was visited in 1956 by P.E. Pourret who took a representative sample of the outcrop, the analysis gave 98.67% SiO_2 and 0.64% total iron.

In 1964-65, Leeds Metals Company undertook a systematic programme of diamond drilling consisting of 19 holes for a total length of 5364 feet. The quartz deposit outlined by drilling would have a minimum length of 2,800 feet, a minimum width of 400 feet and a minimum depth of 500 feet; the minimum proven reserves would be of the order of 33,000,000 tons having an average grade of 98.69% SiO_2 and 0.139% Fe_2O_3.

A 50 ton sample was submitted to the laboratories of Lakefield Research of Canada Limited in 1965 for autogeneous grinding and magnetic separation tests and the results seemed to indicate that a high purity product could be obtained by simple beneficiating procedures.

The deposit lies some 24 miles from Baie St-Paul and some 220 miles from Montreal which is the center of consumption for silica in Quebec. There are no docking facilities nearby on the St. Lawrence River which would allow ship transportation by large tonnage boats, this would seem to be an important consideration for anyone wishing to mine the deposit.

CHAVIGNY Township, Portneuf county.

Range I, S.W., lots 5, 6

Ref.: 1, no.555, p.57.

Massive bed of quartzite on the north side of the Batiscan River. L.H. Cole gives the following granulometric and chemical analyses from a sample taken from the outcrop.

GRANULOMETRIC		CHEMICAL	
Retained on 10	5.10	SiO_2	97.67
14	8.37	Fe_2O_3	0.22
20	9.17	Al_2O_3	1.93
28	14.00	CaO	0.13
35	12.87	MgO	0.13
48	14.70	L.O.I.	0.21
65	11.89		
100	9.10		
150	2.40		
200	5.85		
through 200	6.55		

CLIFTON Township, Compton county

Range X, lots 5A, 5B, 6A, 6B

Ref.: 12, 1966, 1967

This quarry operated since 1964 by Paul Bourque is located a short distance from the Village of St. Edwidge near the road to Coaticook. Operations are intermittent and the output has been used mainly for exterior coatings of artificial stones. The quartz vein or lens is exposed over a width of about 80 feet and over a length of 400 feet

in a N-S direction; the dip is about 50° westward and the county rock is schist and slate. There appears to be many rusty spots but pure white stone is readily available.

CLYDE Township, Labelle county

Range Rivière Rouge West, lots 45, 46, 49-51

Ref.: 2, 1953; 4 (P.E. Bourret, 1954); 10, 1858, pp. 30, 67; 11, 1935-C, p. 69.

Quartz mountain named by Logan rises some 200 feet above the Rouge River on the west side of the Montreal - Mont Laurier highway. Heavily jointed, banded quartzite, high in silica, glassy and milky white constitutes most of the mountain. Certain bands in the quartzite contain kaolin, mica, magnetite and ilmenite.

In 1953, Dominion Silica Corporation did some development work especially on lot 50 and mined some 20,000 tons of quartzite which was subjected to a concentration test at the company plant in Lachine. No further work was done on this deposit.

COURCELLES Township, Berthier county

Range III, lots 24-26

Ref.: 4 (O.D. Maurice, 1954)

A quartz vein up to 30 feet wide runs parallel to highway 43 about 100 feet to the east and extends over the whole width of lots 24 to 26. The quartz is impure and contains iron minerals, mica and some graphite. It was worked from 1949 to 1954 by Ludger Champagne who produced about 17 tons of this material which was sold for exterior coatings of artificial stones.

CUOQ Township, Matane county

Range I, lots 8-18

Range II, lots 8-18

Ref.: 6, no. 121, p.164.

The Val Brillant quartzite formation occurring in this township is sometimes remarkably pure and could constitute a source of silica.

DEQUEN Township, Roberval county

Range VIII, lots 2, 3S½

Ref.: 2, 1944, p.43; 1945, p.44; 2, 1952, p.58; 2, 1953, p.56; 4, (P.E. Bourret, 1934, 1944, 1954; O.D. Maurice, 1967); 11, 1933, pt. D, p.96 (F).

This silica deposit measures some 600 feet in length and 150 feet maximum width; it was opened in 1933by "Produits Silica Canadiens Ltée" who sold some silica to paint manufacturers and to Canadian Carborundum. In 1942, Industrial Silica Corporation took over the operations and produced some 6,700 tons of silica which were sold to St. Lawrence Alloys. Dominion Silica was the owner of the mining rights for a short period in 1952 and 1953 but did not produce any silica during that time. The deposit lay idle until recently when Leo Martineau acquired the mining rights and started to produce silica for the Lake St. John market.

Samples collected in 1933 at 13 different locations gave a silica content varying between 99.65 and 99.44 per cent, part of the iron impurities can be eliminated by magnetic separation.

DERRY Township, Papineau county

Range I, lots 11, 13

Range II, lot 15

Range VII, lot 2

Ref.: 1, 731, pp. 72, 73; 4 (P.E. Bourret, 1937, 1945, 1963);
2, 1946, p.33.

Many pegmatite dykes in Derry township have been sources of quartz as well as feldspar. The best known locations listed above have been worked by A. Parcher, Harry S. Low, International Minerals and Chemical Company and by François Charette. In these deposits, the quartz appears as massive individual bodies easily separated from the feldspar.

DRUCOURT Township, Duplessis county

Watshishou Hill

Ref.: 2, 1944, pp. 43-45; 6, no. 42, pp. 27, 28.

Watshishou Hill rises some 130 feet above sea level between Watshishou River to the west and little Watshishou River to the east. A priliminary examination was made by J. Claveau in 1944; he describes a lens shaped body more than 2,000 feet long and 200 feet maximum width. Grab samples taken along four sections gave excellent grade quartz. The deposit was staked in 1965 by J.M. Yates who conducted an explanatory programme including four diamond drill holes in 1966. This work permitted a more precise outlining of the high grade lenses which are surrounded by zones rich in feldspar and iron streaked.

DUHAMEL Township, Temiscamingue county

Range I, lots 54-57

Range III, near Ville Marie

Ref.: 4 (P.E. Bourret, 1961).

Several quarries on the east shore of Lake Temiscamingue have furnished quartzites for construction and other industrial purposes since 1918. Lots 54-57, range I were staked in 1961 by René Legault for the purpose of extracting these quartzites for the glass industry; no production was ever recorded. The quarries in range III were worked from 1918 to 1935 by O. Hébert who sold the quartzite as building stones and monument bases.

EATON Township, Compton county

Range IV, lot 16

Ref.: 4 (P.E. Bourret, 1959, 1960, 1965).

This quartz deposit was first worked in 1922 in gold prospection. The first shipments of quartz for industrial purposes were made in 1940 and the last shipments were made in 1962 by Bulwer Quarry Inc.

A small knoll some 200 feet long, 100 feet wide and about 15 feet high consists of schists intruded by numerous quartz veins in all directions. The quartz is pure milky white but mining requires close scrutiny to avoid shipping pieces of quartz with schist inclusions.

From 1958 to 1962, 9,500 tons of excellent material valued at $67,500. were used in the manufacture of ferro-silicon at Beauharnois and for exterior surfaces at artificial stones.

EGAN Township, Gatineau county

Range I, lot 58

Range II, lot 64

Ref.: 6, no.23, p.55.

These occurrences are groups of white quartz veins, generally of small size and probably not of economic value. The occurrence on lot 64, range II is about 50 feet wide and contains many rusty patches.

FLEURIAU Township, Rimouski county

Range III, lots 21-24

Ref.: 5, no.430, p.14.

The Val-Brillant quartzites occurring on these lots are rich in silica and could probably find some use in industry.

FRANKLIN Township, Huntington county

Range I, lot 6

Range III, lots 6-14

Ref.: 1, no.555, p.51.

L.H. Cole sampled three locations in Franklin township which is largely underlain by Potsdam sandstones. Sample 1 below was collected on lot 6, range I, near Franklin Centre and represents 15 feet of strata; sample 2 comes from lot 6, range III; it is a white sand derived from the erosion of the surrounding sandstone; sample 3 comes from an outcrop on lot 14, range III, one mile west of Maritana.

GRANULOMETRIC ANALYSES

Mesh	1 Unwashed	1 Washed	2 Unwashed	3 Unwashed	3 Washed
Retained on 14	--	--	6.85	--	--
20	6.94	11.25	5.95	4.60	2.31
28	19.67	28.30	12.24	21.28	19.76
35	18.46	23.40	18.74	17.85	23.51
48	18.53	20.90	35.15	17.74	24.21
65	10.78	8.39	14.12	12.65	17.24
100	9.27	6.50	2.70	10.56	11.91
150	3.07	0.85	0.57	2.48	0.89
200	6.19	0.05	1.39	5.76	0.15
through 200	7.09	0.36	2.29	7.08	0.02

CHEMICAL ANALYSES

	1 Unwashed	1 Washed	2 Unwashed	3 Unwashed	3 Washed
SiO_2	93.12	93.23	94.80	89.62	92.08
Fe_2O_3	0.81	0.26	0.40	0.85	0.44
Al_2O_3	2.57	2.71	0.10	3.73	3.30
CaO	0.22	0.19	1.50	0.26	0.25
MgO	0.20	0.13	0.36	0.15	0.11
L.O.I.	0.35	0.40	0.30	0.69	0.58

GUIGUES Township, Temiscamingue county

Range II, lots 18, 19, 20

Ref.: 1, Laboratory reports 1930, 1931; 3, 1935, p.34; 4 (A.O. Dufresne, 1935; R.H. Taschereau, 1936); 8, no. 201, p. 35.

This loosely cemented sandstone is said to have been discovered in 1919 by Aldor Talbot, it was first staked in 1930 by James Masson and acquired in 1937 by Hill Clark and Francis Ltd. Around 1934-1935, it was worked by Flint Sands Ltd. who extracted about 5,000 tons for foundry purposes. The claims are now owned by Yvon Brousseau of Noranda, Quebec.

The deposit lies near the eastern end of lot 19, it consists of loosely cemented ordovician sandstones averaging more than 97 per cent SiO_2, the washed sand contains 0.07 per cent Fe_2O_3 and 0.03 per cent TiO_2 according to one analysis.

The grains in the sandstone are rounded to angular. A granulometric analysis made at the Mines Branch in Ottawa gave the following results.

Mesh	Per cent
+ 4	0.10
+ 5½	1.18
+ 14	15.50
+ 20	25.39
+ 26	19.21
+ 35	18.12
+ 42	9.98
+ 60	8.04
- 60	2.48

HAVELOCK Township, Huntington county.

Range I, lot 30

Range III, lot 120

Range IV, lot 173

Sample 1, below, was taken from lot 30, range I, near the Havelock fault separating the Covey Hill formation from the Cairnside, sample 2, is from lot 120, range III, in the upper Cairnside formation and sample 3 is a very fine sand resulting from the erosion of surrounding rocks.

GRANULOMETRIC ANALYSES

	1		2		3
Mesh	Unwashed	Washed	Unwashed	Washed	Unwashed
Retained on 14	--	--	--	--	2.70
20	6.65	6.06	2.37	1.85	4.55
28	18.50	21.40	12.58	9.80	10.50
35	10.25	16.55	11.85	12.95	14.68
48	11.56	13.89	18.52	27.66	23.50
65	10.86	14.98	17.08	23.67	20.94
100	15.85	20.40	20.73	23.26	9.75
150	4.68	4.86	2.96	0.70	1.36
200	10.76	1.80	7.07	0.06	2.61
through 200	10.89	0.06	6.84	0.05	3.41

CHEMICAL ANALYSES

SiO_2	88.70	89.02	96.48	97.31	89.70
Fe_2O_3	0.94	0.36	0.66	0.16	0.65
Al_2O_3	4.42	4.09	0.32	1.14	5.45
CaO	0.25	0.09	0.25	0.18	2.10
MgO	0.24	0.23	0.20	0.06	0.48
L.O.I.	0.13	0.29	0.20	0.39	0.80

HEMINGFORD Township, Huntington county

Range II du Clergé, lot 3

Range V, lot 191

Ref.: 4 (P.E. Bourret, 1956); 1, 555, p.51

A quarry was opened in 1955 by Louis Montpetit on lot 3, range II du Clergé, some 6,000 tons of silica were produced in 1955 and 1956 and were sold to Electro Metallurgical Co. in Beauharnois. A mean analysis of 3,000 tons of this sandstone was as follows: SiO_2, 99.27%, Fe_2O_3, 0.10%; Al_2O_3, 0.13%; CaO,0.03%; MnO and MgO 0.01%; L.O.I., 0.26%.

A sample collected by L.H. Cole on lot 191, range V, gave the following analyses.

GRANULOMETRIC			CHEMICAL		
Mesh	Unwashed	Washed		Unwashed	Washed
Retained on 20	1.67	0.85	SiO_2	97.54	98.79
28	7.95	2.12	Fe_2O_3	0.24	0.08
35	12.45	12.35	Al_2O_3	0.28	0.26
48	24.47	31.22	CaO	0.10	0.06
65	22.62	27.75	MgO	0.10	0.06
100	19.50	24.36	L.O.I.	0.14	0.20
150	3.32	1.31			
200	4.25	0.01			
through 200	3.77	0.03			

HUDON Township, Roberval county

Near N.W. shore of Lac Brulé

Ref.: 4 (P.E. Bourret, 1958); 5, no.404, p.12.

A quartz vein some 20 to 25 feet wide and traced for a length of some 300 feet was discovered in 1958 along an escarpment some 25 feet high. The country rocks are Grenville limestones and quartzites.

Quebec Silica Mines Limited drilled 13 holes in 1958 and 1959 totalling 1050 feet to find the extension of the vein in depth. No production was recorded from this property. Samples 1 and 2, below were collected by P.E. Bourret in 1958, no.1 from the foot of the escarpment consisted of white milky quartz pieces and no.2 along the vein at intervals of two feet consisted of milky white quartz with vugs often filled with gray and rusty clay.

	Sample 1	Sample 2
SiO_2	99.16	99.16
Fe_2O_3	0.14	0.16
Al_2O_3	0.34	0.31
CaO	0.01	0.01
MgO	0.09	0.14
L.O.I.	0.09	0.12

ILES DE LA MADELEINE County

Ref.: 3, 1903, p.73; 4 (O.D. Maurice, 1966).

The islands of the archipelago are joined by sand dunes which have long attracted attention because of the light colour of the sand. O.D. Maurice sampled these sands at five places in 1966; sample 1 (below) came from dune du Nord one mile from Cap-aux-Meules; sample 2 came from dune du Sud, four miles from Alright island; sample 3 came from dune du Nord, two miles northeast of Ile-au-Loup; sample 4 came from Ile de l'Est, 2 miles north of Coffin island; sample 5 from dune de l'Ouest, 500 feet south of Cap-aux-Meules island.

GRANULOMETRIC

Mesh	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
+ 40	0.1	7.0	0.2	1.8	0.9
+ 50	23.0	38.5	27.3	40.9	37.9
+ 70	73.0	48.2	67.3	53.0	51.6
+ 100	3.8	6.2	5.1	3.7	9.2
+ 100	0.1	0.1	0.1	0.6	0.4

CHEMICAL

SiO_2	94.03	94.47	95.20	94.40	93.10
Fe_2O_3	2.03	1.42	1.89	2.04	2.17
Al_2O_3	1.68	1.87	1.59	1.82	1.85
CaO	0.23	0.24	0.14	0.31	0.30
MgO	0.10	0.12	0.10	0.10	0.21

It thus appears that the dune sands could not be used without costly beneficiation for the manufacture of flint glass since many of the dark particles in the sand appear to be pyroxenes and the high percentages of Al_2O_3 and CaO are due to the presence of feldspars.

The sands were tested and used successfully as flux in a base-metal plant in New Brunswick; a small production for testing purposes was recorded in 1966; since then, Silica Sands Limited has obtained a mining lease on Dune du Nord but no report of production has yet been received.

ISLE PERROT Seigniory, Vaudreuil-Soulanges county

Pointe du Domaine, cadastral lot 167

Ref.: 1, 555, p.53.

The Potsdam sandstones of Isle Perrot were sampled by L.H. Cole and the analyses are reproduced below.

	GRANULOMETRIC			CHEMICAL
	Unwashed	Washed		Unwashed
Retained on 10	- -	0.20	SiO_2	95.08
14	2.55	4.65	Fe_2O_3	0.33
20	5.63	10.65	Al_2O_3	0.67
28	7.00	12.70	CaO	1.60
35	14.50	17.90	MgO	0.44
48	21.35	20.70	L.O.I.	1.40
65	17.65	16.90		
100	12.90	10.70		
150	2.95	2.40		
200	6.50	2.70		
through 200	8.97	0.50		

JOLY Township, Labelle county

Range H, lot 29

Ref.: 11, 1934-E, p.46.

A quartz vein is exposed over a width of 50 feet and a height of 50 feet. It contains biotite, pyrite and tourmaline associated with the quartz. Some sections appear to be quite free of impurities.

KAMOURASKA Seigniory, Kamouraska county

Near St. Pascal

Ref.: 1, 555, pp.59, 60.

The Cambro-Ordovician quartzites near St.Pascal were sampled in three places by L.H. Cole. Sample 1 (below) came from a ridge some 3¾ miles from St. Pascal Station on the Canadian National railway, sample 2 came from a ridge three miles southeast from the wharf at Kamouraska and sample 3 came from a ridge three miles southwest of the station of St.Pascal about 1/2 mile from the railroad.

GRANULOMETRIC

	Sample 1	Sample 2	Sample 3
Retained on 10	10.55	10.02	4.80
14	11.20	11.05	7.65
20	6.70	7.37	7.00
28	6.40	6.95	7.30
35	6.50	8.12	5.30
48	10.65	10.30	8.32
65	11.80	11.09	10.38
100	13.55	12.90	14.80
150	5.00	4.10	5.25
200	4.95	7.35	4.75
through 200	12.70	10.75	24.45

CHEMICAL

	Sample 1	Sample 2	Sample 3
SiO_2	95.40	96.80	95.42
Fe_2O_3	0.35	0.32	0.42
Al_2O_3	1.65	1.13	0.68
CaO	0.86	0.60	0.80
MgO	0.75	0.43	0.62
L.O.I.	0.30	0.35	0.30

KILKENNY Township, Montcalm county

Range I, lots 751, 752

Range II, lot 797

Ref.: 2, 1947, p.49; 4 (P.E. Bourret 1943, 1946, 1947).

This deposit was discovered around 1939 by J.R. Bonhomme who tried to develop the property after that year and until 1948.

In 1947, Consumers Industrial Minerals Limited was organized and went into production selling crude quartzite for rock wool manufacturing, moulding sand and other uses, all operations closed in 1948.

The quartzite deposit was uncovered over a length of 600 feet and an average width of 100'; the quartz is fractured, gray to white in colour with many rusty patches especially along joints. The contacts with the surrounding gneiss are irregular and small bands of the latter rock occur in the quartzite. It was not possible to find an economic method to beneficiate this ore to make it suitable for use in the manufacture of flint glass.

LAC DES DEUX MONTAGNES Seigniory, Deux Montagnes county

Parish of St. Canut, lots 125-130, 145, 146.

Parish of St. Benoit, lots 206, 207, 210-214

Parish of Ste. Scholastique lots 291-304

Ref.: 1, no.555, pp.125-130; 3, 1917, 1918, 1920, 1933;

4, O.D. Maurice, 1967.

The Potsdam sandstone in the vicinity of St. Canut constitute the most important source of silica in Quebec. The area had a long history starting around 1917 when Stinson-Reeb Builders Supply Co. opened a quarry on lot 130. From 1920, the mine and mill were operated by Cascade Silica Products who sold the property to Silica Ltd. in 1924. In 1929, Canadian Carborundum acquired the property and operated the mine until 1954 when it was sold to Canadian Silica Corp.

A new mill was built in 1955 capable of producing 100,000 tons of silica products annually.

The mill was enlarged in 1962 and brought to a capacity of 300,000 tons. Finally in 1965, control of the company was acquired by Industrial Minerals of Canada who had already acquired some property in the nearby parished of Ste. Scholastique and St. Benoit. The new International Airport to be built north of Montreal is to be constructed near the silica mines of St. Canut so that the company is presently negociating the displacement of all its operations to the area of Ste. Scholastique where the deposit lies outside the zone of influence of the new airport.

Silica products of all specifications have been prepared in the mill at St. Canut and it is expected that beneficiation will be easier yet at Ste. Scholastique since there is no pyrite in the ore.

Following are a few analyses of the ore from different sources. Sample 1 is the unwashed product from Ste. Scholastique, sample 2 is the same product washed, scrubbed and passed through a magnetic separator, sample 3 is from lot 130, St. Canut (Reference 3, 1918).

	Sample 1	Sample 2	Sample 3
SiO_2	99.10	99.60	99.42
Fe_2O_3	0.08	0.025	0.12
Al_2O_3	0.45	0.20	0.16
CaO	0.04	0.03	0.07
MgO	0.01	0.01	0.09
Na_2O	0.04	0.03	
K_2O	0.02	0.02	
TiO_2	0.03	0.02	
L.O.I.	0.20	0.10	

LAFLECHE Township, Saguenay county.

Two miles south of St. Joseph Lake

Ref.: 4 (O.D. Maurice, 1970); 5, no.481, p.5; 11, 1933-D, p.185 (F).

Precambrian quartzites outcrop at several places in Laflèche township along the Manicouagan River and near the road leading north from Baie Comeau to the Hydro-Electric dams of the Manicouagan complex. The latter location was staked around 1962 and a company was formed in 1969 to develop these quartzite deposits. Universal Minerals Corporation conducted a substantial programme of diamond drilling in 1969 and 1970 and sufficient ore of high quality was discovered to furnish a lively exploitation during several years.

The main impurities in the quartzites are mica and feldspar and gneiss inclusions as well as basic dykes often constitute annoying conditions which could cause some problems in mining the ore. Bulk samples were extracted in 1970 and concentration tests are being made in various plants notably in the pilot mill of the Quebec Department of Natural Resources.

LANGIS Township, Matapedia county

Range IV, lots 5-10

Range V, lots 5-10, 36- 37

Range VI, lot 40

Range VII, lots 40-42

Ref.: 6, no. 121, p.164.

Both the Kamouraska formation and the Val Brillant formation in this township are possible sources of silica.

LORANGER Township, Labelle county

Range I, lots 19, 20

Ref.: 2, 1951, p.50; 4 (P.E. Bourret, 1950, 1952, 1954); 11, 1934 E, p.46.

Quartzite bands in this township have been noted by F.F. Osborne in 1934. The band on lots 19 and 20, range I, is 300 feet wide and was traced for a distance of 1,500 feet in an east-west direction,

it dips 35° southward. The quartz is coarse, glassy white to gray in colour, it is often cut by numerous syenite dykes. Three holes were drilled in 1951 for a total length of 1336 feet; hornblende and feldspathic bands are the main impurities, the numerous joints are quite rusty. Operations were suspended in 1953 at which time the property was owned by Dominion Silica Corporation.

LUSSIER Township, Montcalm county

Range II, lots 27, 28

Range III, lots 11-21

Ref.: 4 (A.O. Dufresne, 1939; P.E. Bourret, 1963, 1965; O.D. Maurice, 1966); Gill, J.E. 6th Commonwealth Mining & Metallurgical Congress, p.222.

This silica deposit is known since 1939 when A.O. Dufresne reported on this occurrence. It was first acquired in 1952 by Dominion Silica Corporation who operated the mine almost continuously until 1963. In 1963, a new company, Dominion Industrial Minerals undertakes the construction of a mill at St.Donat to replace the mill at Lachine which had proven to be uneconomical. Other companies operated the mine and mill until 1966 when all operations ceased for a while until the property was finally acquired by Indusmin.

A band of pure quartz some 1,500 feet long and averaging 225 feet in thickness extend to a minimum depth of 250 feet. A typical analysis of this quartz given by J.E. Gill follows:

SiO_2	99.38	Fe_2O_3	0.015	Al_2O_3	0.467
CaO	0.008	MgO	0.006	K_2O	trace

This band of quartz lies within a larger impure quartzite band which is itself surrounded by schists and gneisses; the central core of pure quartz has been leached of its impurities along fracture zones leaving a much more porous rock with the pores often lined or filled with kaolinite.

MARCHAND Township, Labelle county

Range II, lots 14-16

Ref.: 11, 1934-E, p.46.

The quartzite band which was mined for a short period in 1952 and 1953 in Loranger township extends eastward into Marchand township where it has not been developed.

MATANE Township, Matane county

Ranges XII, XIII

Ref.: 6, no. 121, p.164

The Kamouraska quartzites occur along the Bastien Brook in ranges XII and XIII. No work was done on these quartzites but they are potential sources of silica.

MILLE ISLE Seigniory, Deux-Montagnes county

St. Eustache Parish, lots 205-212, 215-217

Ref.: 4 (A. Deland, 1963)

Prospecting work including diamond drilling (3 holes totalling 298 feet) was done in 1963 on Potsdam sandstone occurrences on these lots. This work was done by Corporation Administrative Services Ltd. The sandstone in the drill core as well as on the outcrops is often tinted by iron oxydes easily recognisable by red and brown streaks on an otherwise light gray surface; no work was done there after 1963.

MONTAUBAN Township, Portneuf county

Ranges IV, V, S.W.

Ranges IV, V, N.E.

Ref.: 1, no.555, p.57; 4 (P.E. Bourret, 1954)

Wide bands of Grenville quartzites occur in several lots near the village of Notre-Dame-des-Anges; the rock is generally granular, vitreous and gray but it contains at places interstratified schist bands which make it unsuitable for any industrial use. Elsewhere the schist bands are clearly defined and quite narrow. L.H. Cole sampled one outcrop on lot 1, range V, N.E., the results of analysis are reproduced below.

	GRANULOMETRIC		CHEMICAL
Retained on 10	8.35	SiO_2	97.67
14	11.75	Fe_2O_3	0.22
20	9.90	Al_2O_3	1.93
28	12.00	CaO	0.13
35	10.85	MgO	0.13
48	10.65	L.O.I.	0.21
65	12.61		
100	8.50		
150	2.25		
200	5.77		
through 200	7.37		

PILGRIM ISLANDS Seigniory, Kamouraska county

Ref.: 1, no.555, p.59; 4 (E.W. Greig, 1945).

These islands, situated near the south shore of the St. Lawrence River about 100 miles below Quebec City, are often known as the Islands of the Three Pilgrims. The only inhabitant is the lighthouse keeper and his family who live on Long Pilgrim Island 8 or 9 months of the year. The group comprises five islands composed essentially of quartzite formation belonging to the Quebec group of Cambro-ordovician age.

An average of 7 samples collected by E.W. Greig in 1944 gave the following results.

SiO_2	Fe_2O_3	Al_2O_3	TiO_2	CaO	MgO	P_2O_5	As_2O_5
98.72	0.26	0.69	0.046	0.2	0.088	0.01	0.002

In thin section, the minerals hematite, magnetite, pyrite and probably ilmenite constitute the fine opaque material but positive identification is not possible because of the small particle size.

No serious attempt was made to mine the quartzite on these islands; some staking was done in 1966 by Paul Charbonneau followed by some trenching and stripping but apparently no large scale beneficiation tests were made.

POPE Township, Labelle county

Ranges I, II

Ref.: 6, no. 23, p.55.

In the northeast part of Pope township, several boulders of rose quartz up to two feet in diameter were found. The veins from which these boulders are derived are probably close by since narrow veins of the same material were found in place in the same township. This material could be used for ornemental purposes if it were found in quantity.

PORTLAND Township, Papineau county.

Ref.: 4 (P.E. Bourret 1942, 1944)

The many pegmatite dykes in Portland township which have been mined principally for feldspar often contain quartz in appreciable amounts and sufficiently detached from the feldspar to make possible the extraction of the quartz. Some of the better locations are in Portland East, range III, lots 11 and 12 and in Portland West, range V, lots 2, 7, 8, range VII, lot 5 and range IX, lot 14. The latter location was mined for quartz in 1941-42 by Rodrigue Hart who sold the product to Electric Reduction Company of Buckingham.

PROVOST Township, Berthier county

Range XIII, lots 5, 6 SE$\frac{1}{2}$

Range XIV, lot 1 NE$\frac{1}{2}$

Range XV, lot 1 SW$\frac{1}{2}$

This deposit is located about 2 miles northeast of Saint-Zenon. Exploration work including trenching and 15 diamond drill holes was done

in 1965 by Superior Silica Mines Ltd. The quartz band is inserted between garnetiferous quartzites and biotite gneiss; this band would be 15 feet wide and 1650 feet long according to company reports.

RIGAUD-VAUDREUIL Seigniory, Beauce county

Range I, N.E., St. François Parish, lot 185

Ref.: 4 (P.E. Bourret, 1948; 8, no 127, p.83

There are numerous quartz veins in Rigaud-Vaudreuil seigniory and vicinity varying in width from a few inches to more than 25 feet. They have been prospected and analysed for their possible gold content but never for their possible use as a source of silica.

The vein on lot 185 is exposed over a width of 25 feet by 10 feet; the quartz is massive, milky white and apparently very pure away from the wall rock. A chip sample from the middle portion of the vein gave the following analysis: SiO_2, 99.09% et Fe_2O_3, 0.01%.

Work on this quartz deposit dates back to 1866 when the "DeLery Gold Mining Company" explored this vein in shallow underground workings; the quartz was found to be barren of gold.

RISBOROUGH Township, Frontenac county

Range IX, lots 8-B, 9 N½

Ref.: 4 (P.E. Bourret, 1959); 6, no.131, p.45.

An east-west striking quartz lens has been uncovered over a length of 215 feet and a width of 166 feet. The country rock is sericite schist. The quartz is milky white containing few inclusions of the country rock and few rusty patches. The mine is operated intermittently by Jos. Dupuis and Paul Veilleux of Robertsonville, much of the output has been sold to Electro-Metallurgical Company of Beauharnois.

ROBERTSON Township, Labelle county

Ranges IX, X, XI

Ref.: 6, no.23, p.55.

Large boulders up to two feet in diameter of rose quartz were encountered at several places in these ranges. The area is good prospecting ground for this valuable ornamental material.

STE. ANNE Seigniory, Champlain county

Range Price, St. Adelphe Parish, lots 761-763

Ref.: 4 (O.D. Maurice, 1966)

This quartzite deposit was prospected in 1966 by Patrice Vandal of St. Adelphe. Quartzite bands can be followed readily along a 30 foot high embankment over a distance of 1500 feet. The outcrops contain many interbeds of schists but high purity zones are possibly present, no rust was seen in the fissures and joints.

SAINT DENIS Seigniory, Kamouraska county

Ref.: 5, no.494, p.5

The quartzites of the Quebec group of Cambro-Ordovician rocks outcrop in extensive NE trending bands near St. Philippe-de-Néri and Rivière Ouelle Junction; some of these could be considered as possible sources of industrial silica.

SOULANGES Seigniory, Vaudreuil-Soulanges county

Cascades Point

Ref.: 1, no.555, p.53.

A quarry was operated at this location before 1919 by the Cascades Silica Products Co. Ltd. That year, the company moved its plant to St. Canut where the rock was easier to grind.

L.H. Cole collected two samples at Cascades Point, sample 1 (below) is a 15 pound sample obtained by quartering 200 pounds of crushed rock from the mill and sample 2 represents the washed sand produced at the mill.

GRANULOMETRIC	Sample 1 Unwashed	Sample 2 Washed
Retained on 10	10.32	--
14	8.30	--
20	6.50	1.15
38	8.72	2.30
45	11.35	7.80
48	11.92	14.70
65	15.00	28.50
100	7.47	21.50
150	2.20	6.30
200	7.32	13.35
through 200	10.90	4.40

CHEMICAL	Sample 1 Unwashed	Sample 2 Washed
SiO_2	92.40	94.40
Fe_2O_3	1.05	1.05
Al_2O_3	2.95	1.66
CaO	0.50	1.00
MgO	0.29	0.18
L.O.I.	0.70	0.40

STUKELY Township, Shefford county

Range X, lot 23

Ref.: 4 (P.E. Bourret, 1958 to 1960)

Narrow veins and lenses of quartz were uncovered by tranching in 1958; numerous large blocks are seen in the vicinity. One lens measures some 12 feet in width and was uncovered over a length of 20 feet; the country rock is shale. In 1959, a shipment of 176 tons was made by Adams Quartz and Crystals to the plant of Electro-Metallurgical Company in Beauharnois. The quartz is milky white and quite pure but precautions must be taken to avoid shale particles which occur as inclusions in the mass.

TEMPLETON Township, Papineau county

Range I, lots 14-15

Ref.: 1, no.555, p.55; 4 (P.E. Bourret, 1934-1949).

This sandstone deposit was worked from 1927 to 1930 by Canada Glass Sand Ltd; from 1931 to 1941 by Ottawa Silica and Sandstone Ltd; in 1942, Industrial Sands and Minerals Corporation worked the deposit for a few months. The property lay idle until 1949 when Ottawa Silica & Rock Wool Ltd. attempted to revive the exploitation, spending considerable sums to improve milling facilities; no production was recorded from this latter operations.

The sandstone is high in silica but must be beneficiated to eliminate the iron sulphides. During the productive years, the output was sold mainly as blast sand and foundry sand.

L.H. Cole sampled these sandstones and reported the analyses in 1923. Sample 1 (below) is a general surface sample collected over a large area and sample 2 was taken from a pile of broken material which had recently been quarried.

GRANULOMETRIC

	SAMPLE 1		SAMPLE 2	
	Unwashed	Washed	Unwashed	Washed
Retained on 10	2.07	--	2.25	4.75
14	2.62	--	2.72	3.35
20	2.57	2.21	3.53	4.90
28	7.75	4.75	11.30	8.60
35	15.30	24.21	26.01	24.45
48	27.30	40.30	31.95	38.50
65	13.99	16.84	11.22	10.40
100	10.30	10.95	6.30	4.35
150	2.60	0.65	1.23	0.45
200	5.10	0.04	1.73	0.20
through 200	10.40	0.05	1.76	0.05

CHEMICAL

	SAMPLE 1		SAMPLE 2	
	Unwashed	Washed	Unwashed	Washed
SiO_2	98.75	98.10	97.76	---
Fe_2O_3	0.56	0.62	0.09	---
Al_2O_3	0.24	0.38	1.07	---
CaO	--	--	--	---
MgO	0.15	--	0.17	---
L.O.I.	0.20	0.50	0.91	---

Range XII, lot 20 S½

Ref.: 4 (P.E. Bourret, 1950)

A pegmatite dyke is uncovered over a length of 400 feet and a width of 200 feet, it forms a ridge about 100 feet high. It was worked intermittently from 1930, for both feldspar and quartz, first by Frank Toutloff then around 1950 by Arthur Wallingford.

The northeast part of the dyke contains mostly vitreous quartz, highly fractured and a little rusty in the joints. The output was sold to Electric Reduction Co. in Buckingham and to St. Lawrence Alloys and Metals in Beauharnois.

WOLFE Township, Terrebonne county

Range II, III, lots 25, 26

Ref.: 11, 1935-C, p.70.

A pit sunk on a pegmatite dyke a short distance north of Cordon Lake revealed some very pure quartz; the extent of the dyke is not known. A sample was analysed in the laboratories of the Quebec Bureau of Mines giving 99.82% SiO_2 and 0.10 per cent Fe_2O_3.

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FOUNDRY SANDS

There are, in Quebec, some forty establishments engaged in foundry work such as grey iron castings, non ferrous castings, cast iron soil pipes and fittings, plumbing fixtures etc. These foundries require a refractory sand which should not only resist sintering but also be highly permeable, strong in compression shear and tension both in the green state and at very high temperatures. Silica sand is the best material for this purpose, very often it is a high purity sand or crushed sandstone to which is added a binding clay or the sand already contains the clay bond in which case it is a natural molding sand.

In recent years, all the foundry sand produced in Canada came from the silica producers in Quebec but the quantity produced is insignificant compared to the figures of consumption as shown in the following table compiled from figures of the Dominion Bureau of Statistics.

FOUNDRY SAND PRODUCTION AND CONSUMPTION

	Production Canada	Production Quebec	Consumption Canada
1959	39,833	3,923	179,145
1960	16,790	3,667	150,463
1961	24,798	770	131,249
1962	17,115	770	169,156
1963	26,420	3,579	246,617
1964	39,154	17,743	235,340
1965	30,193	17,193	377,728
1966	17,418	17,418	765,215
1967	4,092	4,092	670,108

The deposits of natural moulding sands in Quebec are generally small and have furnished on occasion some material for local or nearby foundries; the sand has been used for moulding small pieces of ferrous and non ferrous metals. No deposit of coarse sand suitable for steel castings is known in Quebec.

Following is a list of deposits of natural moulding sands and some of their characteristics.

Principal References

(1) Canada Department of Mines, Mines Branch, No.

(2) Quebec Bureau of Mines, Annual Report

(3) Office files

(4) The Mining Industry of the Province of Quebec

(5) Mines Branch Investigation Report.

LIST OF OCCURRENCES

ACTON Township, Bagot county

Range IV, lots 32, 34 and 35

Range V, lots 30, 52

Ref.: 1, no.767, p.34; 3, (H. Girard, 1935); 2, 1936-E, p.21.

On lots 34, 35 at Acton Vale on the south side of Moose River, a fine grained sand was sampled at three places at 150 feet intervals. The mechanical analysis is shown below (sample 1).

Another sample (no.2 below) was taken from a small deposit on lot 30, range V, 1.5 miles N.-E. of Acton Vale on the west side of Moose River.

Sample 3 below was taken from lot 52, range V, 3.5 miles N.E. of Upton Village, this deposit is estimated to contain about 20,000 cu. yards of fine grained brown sand with much more clay than the analysis shows because the sample contains a mixture of two types of sand, one of which is poor in clay.

GRANULOMETRIC

	Sample 1	Sample 2	Sample 3
Retained on 12	0.25	---	0.02
20	0.69	0.07	0.03
40	0.65	1.02	0.29
50	2.41	3.78	4.79
70	6.69	8.44	11.77
100	22.52	20.71	15.51
140	17.74	18.91	10.53
200	16.52	18.15	14.91
270	4.61	4.55	5.25
through 270	19.36	17.53	26.10
clay substance	8.20	6.38	10.30

	Moisture	Permeability	Compr. Strength lb./square inch
Sample 1	4.2	9.4	7.6
	6.0	13.5	6.5
	8.0	15.5	4.9
	9.9	14.9	4.1
Sample 2	4.1	16.6	4.7
	6.0	18.6	4.4
	7.5	18.6	4.0
	7.8	18.0	4.0
Sample 3	4.5	4.3	7.7
	6.5	6.7	7.6
	8.0	7.8	7.5
	9.9	7.6	6.5

ARGENTEUIL Seigniory, Argenteuil county

Parish of St. Andrews East, lot 48A

Ref.: 2, 1936-C, p.57.

This deposit covers an area of about 500 square feet, the sand band has a maximum thickness of one foot, another pit 300 feet distant contains a yet smaller lens-like deposit of thickness up to two feet.

The sand is relatively coarse grained and highly permeable, the compressive strength is quite low. It possibly could be used for medium weight castings.

A sample taken by H.W. McGerrigle in 1936 gave the following analyses; the permeability tests were made according to the standard method described in "Testing and Grading Foundry Sands" March 1931 edition, pages 40 and 41, published by the American Foundrymen's Association.

	Granulometric	Moisture per cent	Permeability	Compressive Strength lb/scuare inch
Retained on 12	0.12	4.5	3.32	2.00
20	12.84	6.0	5.69	1.35
40	58.21	7.5	3.23	2.00
50	6.21	8.1	3.34	1.25
70	7.20			
100	2.71			
140	1.86			
200	2.44			
270	0.69			
through 270	3.02			
clay substance	4.56			

BOUCHERVILLE Seigniory, Chambly county
Boucherville Parish, Range I, lot 4
Ref.: 2, 1936-E, p.34.

Near the highway between Boucherville and Varennes, a layer of moulding sand lies under 1.5 feet of soil, its thickness is about three feet at this point, it is fine grained, light brownish-gray and composed essentially of quartz, basic minerals, feldspar and little mica. The reserves are estimated at 10,000 cu. yards. Sample 1, below, represents a mechanical analysis of this sand.

St. Bruno Parish, Rabastalière concession, lots 144, 165, 173, 174
Range II, lot 486
Ref.: 2, 1936-E, pp. 30-32.

A sand pit on lot 144, 500 feet west of the road to St. Bruno mountain contains moulding sand under six inches of soil, the thickness of the layer is one to two feet. The reserves may be quite high.

S2, below was taken from the N-E edge of the pit and S3 from the S-E corner.

On the S-W side of Mt. St. Bruno, on lot 165, a sample (S4) was taken from a layer of medium to coarse sand lying under six inches of soil, the thickness of the layer at the point of sampling was one foot.

Another sand pit occurs on the east side of the road going to the mountain from St. Bruno on lots 173, 174. A layer of moulding sand underlies one half to one foot of soil, its thickness varies from one to three feet. S5, below, was taken from the west side of the pit and S6 toward the east end. The estimated reserves are of the order of 5,000 cu. yards.

On concession II, lot 486, about 2 miles southeast of St. Bruno, a sample (S7) was taken from a layer of moulding sand two feet thick probably restricted in size. The sand is fine grained, light brownish and cross bedded.

GRANULOMETRIC

	S1	S2	S3	S4	S5	S6	S7
Retained on 6	--	0.02	0.51	--	--	0.68	--
12	0.13	0.13	3.16	0.01	0.29	2.58	0.01
20	0.25	1.97	13.41	0.80	3.72	8.25	0.34
40	0.76	25.32	32.41	28.99	30.74	19.67	1.55
50	1.46	23.16	19.61	23.94	24.17	12.15	1.45
70	6.85	25.73	14.66	24.51	22.11	24.38	3.11
100	15.71	10.31	2.39	8.12	5.46	9.46	6.99
140	12.60	1.26	0.72	1.70	1.11	1.81	9.15
200	13.46	0.71	0.77	0.98	0.99	1.33	14.59
270	1.42	0.04	0.01	0.02	0.04	0.02	1.03
through 270	26.12	2.11	3.41	2.08	3.27	0.51	44.37
Clay substance	20.98	9.06	8.69	8.44	7.82	13.03	17.12

	Moisture per cent	Permeability	Compressive Strength lb/square inch
	4.6	4.5	13.0
Sample 1	6.2	6.0	12.3
	8.0	7.6	10.8
	4.8	46.3	5.1
Sample 2	6.3	115.8	4.9
	8.1	143.2	3.9
	4.8	194.1	4.1
Sample 3	6.1	267.1	3.0
	7.8	255.7	1.9

	Moisture per cent	Permeability	Compressive Strength lb/square inch
	5.0	45.2	2.7
Sample 4	6.9	69.9	4.5
	8.2	104.0	4.1
	4.5	73.2	4.5
Sample 5	6.5	103.8	5.8
	8.3	172.1	3.9
	4.8	30.1	7.0
Sample 6	6.5	47.4	7.7
	8.2	92.6	5.2
	4.0	4.5	6.3
	5.5	6.1	6.1
Sample 7	6.0	7.1	6.3
	7.5	8.4	5.8

BOURCHEMIN Seigniory, Bagot county

St. Hugues Parish, East Range, west end

Ref.: 2, 1936-E, p.25

A small deposit of sand about two feet thick in irregular lenses and poorly sorted is found 5.5 miles west of St. Hugues, on the west bank of a small stream, on N-E side of road parallel to the Yamaska River (See analysis below).

Granulometric		Moisture	Permeability	Compressive Strength
		per cent		lb/square inch
Retained on 6	0.22	4.7	29.2	5.5
12	0.26	6.4	46.7	4.5
20	1.44			
40	9.19			
50	10.09			
70	17.02			
100	18.23			
140	11.80			
200	7.51			
270	1.24			
through 270	9.41			
clay substance	13.20			

CHAMBLY Seigniory, Chambly county

Chambly Parish, Concession I, lot 327

Ref.: 2, 1936-E, p.34.

The deposit is on the west bank of the Richelieu River, two miles south of the Chambly bridge. The estimated reserve is about 10,000 cu. yards over an area 2,000 feet long, 150 feet wide and an average of one to one and a half feet thick. About 6 inches of soil covers the moulding sand which is fine grained with a high clay content (see analysis below).

Granulometric		Moisture per cent	Permeability	Compressive Strength lb/square inch
Retained on 6	1.64	4.5	4.1	8.6
12	1.59	6.2	7.1	9.3
20	1.89	8.1	8.1	8.5
40	3.53			
50	2.50			
70	5.12			
100	9.50			
140	9.69			
200	15.65			
270	1.63			
through 270	29.68			
clay substance	17.46			

CHATHAM Township, Argenteuil county
Range I, lots 12, 13

Ref.: 2, 1936-C, pp. 58, 59

The deposit measures 400 feet by 50 feet in its widest portion, the band of sand is suitable for light weight castings. The analyses below represent the average of three samples.

Granulometric		Moisture	Permeability	Strength lb/sq. inch
Retained on 40	0.05	4.5	4.2	6.5
50	0.31	6.4	5.5	6.8
70	0.76	8.1	6.8	7.1
100	3.02	9.8	6.7	7.0
140	9.30			
200	22.76			
270	8.17			
through 270	42.65			
clay substance	12.47			

Range VIII, lot 6

Ref.: 1, no.767, p.34; 2, 1933, pt.A, p.83; 2, 1936 pt.C, p.57, 58.

The deposit occurs on the east side of a small stream, it runs for a length of 2,000 feet in a north-south direction, the width varies from 50 to 500 feet and the maximum thickness is 1.5 feet. Sample 1 below, represents the sand in the northern part of the deposit and sample 2 represents a wide area to the south. T. McOuat and Son Machine Shop at Lachute has extracted some sand from the northern part of the deposit.

	Granulometric		Moisture	Permeability	Compr. Strength lb/square inch
	Sample 1	Sample 2		Sample 1	
Retained on 6	--	0.31	4.8	1.3	7.7
12	--	0.28	6.8	1.8	7.8
20	--	0.51	8.6	2.3	7.6
40	0.13	0.58	10.4	2.7	9.2
50	1.22	0.36			
70	3.52	0.90		Sample 2	
100	3.35	3.82	5.1	4.1	6.5
140	3.71	7.01	6.2	6.3	7.8
200	15.78	25.85	8.2	8.6	7.3
270	7.74	10.45	9.8	9.8	6.9
through 270	46.32	40.93			
clay substance	17.85	8.86			

CONTRECOEUR Seigniory, Verchères county

Contrecoeur Parish, Range I, lots 110, 153-155

Ref.: 2, 1936-E, p.33

Sample 1 (below) was collected alongside the main highway, 2.5 miles north of Contrecoeur on lots 153-155, range I. The moulding sand occurs in lenses and the reserves are not believed to be large.

Sample 2 (below) was taken from a roadside sand pit, 3/4 mile west of St. Roch Station on lot 110. The moulding sand layer lies under one to two feet of earth, it is two to three feet thick. The reserve is probably large.

Granulometric			Moisture	Permeability	Compr. Strength lb/square inch
	Sample 1	Sample 2		Sample 1	
Retained on 6	0.34	--	5.3	15.0	4.9
12	0.18	0.01	6.5	17.2	5.5
20	0.59	0.04	8.4	16.9	5.1
40	2.78	0.81			
50	2.47	1.64		Sample 2	
70	1.68	7.58	4.2	33.4	3.2
100	5.80	27.95	6.0	40.1	3.0
140	15.54	23.78	7.8	39.3	2.9
200	27.04	17.51			
270	7.37	1.00			
through 270	29.78	14.51			
clay substance	5.99	4.93			

DASSERAT Township, Rouyn-Noranda county

Mining Concession no.296, SW corner of township

Ref.: 3, P.E. Bourret, 1938; 3, John Campbell 1938.

A deposit of sand of considerable extent occupies a great part of two claims in this area. Noranda Mines is said to have used some 40 cars of this material as flux in the early thirties. A sample of this sand analysed as follows: SiO_2, 81.0%; Al_2O_3, 11.8%; Fe, 1.6%.

The deposit was explored around 1938 by Mary-Ann Breen and at last report (1969) some exploration was being done by Daniel Breen for Laurentia Silica Mines Co. Ltd.

DURHAM Township, Drummond county

Range IX, lot 15

Ref.: 1, no.767, p.50.

Three bands of clayey sand occur in a sand and gravel pit; the top layer about 4 feet thick lies beneath 6 inches of overburden, the two other layers lie some 50 feet lower and are 5 to 8 feet thick.

Samples 1 and 2 collected by C.H. Freeman in 1929 and representing the top and lower layers respectively were analysed as follows.

Granulometric			Moisture	Permeability	Compr. Strength lb/square inch
	Sample 1	Sample 2		Sample 1	
Retained on 12	0.42	0.25	4.1	69.1	2.2
20	5.10	0.98	5.9	76.3	2.9
30	6.86	1.90	8.0	100.7	2.6
40	9.16	3.50			
50	15.22	7.53		Sample 2	
70	19.26	12.36	4.0	33.1	2.2
100	18.52	18.82	6.1	35.1	2.1
140	11.46	19.42	8.1	33.5	2.0
200	4.76	12.18			
270	2.80	8.81			
through 270	2.74	11.96			
clay substance	3.6	2.3			

ELY Township, Shefford county

Range XI, lot 14

Ref.: 2, 1936-E, p.20.

The deposit lies on the north bank of Black River, 1500 feet downstream from the bridge on Belhary Road. The layer of moulding sand lies under 1.5 feet of soil and is about 1.5 feet thick; it covers an area some 900 feet long and 150 feet wide. The reserve is estimated at 7,000 cu. yards (see analysis below).

Granulometric		Moisture	Permeability	Strength lb/ square inch
Retained on 12	0.03			
20	0.37	4.8	1.2	11.1
40	1.80	6.8	1.9	12.2
50	2.01	8.6	3.1	11.9
70	5.51	10.4	4.6	11.2
100	10.61			
140	13.42			
200	17.10			
270	4.43			
through 270	22.24			
clay substance	22.32			

FARNHAM Township, Missisquoi county

Range III, lot 30

Ref.: 1, no.767, p.54; 2, 1933 pt.A, p.83; 4, 1947, p.49; 5, no.2135, 1946.

This deposit was in operation for at least 60 years from the 1890's selling moulding sand to foundries; the last known operator was Theophile Belval who shipped small tonnages in the late 1940's.

The thickness of the moulding sand layer is about 1.5 to 2.0 feet, the band can be followed for a distance of 190 feet on the bank of the Yamaska River.

C.H. Freeman reports two analyses of this sand, sample 1 was collected at the location of the deposit and sample 2 was obtained from a foundry in St. Johns which was using this material.

Granulometric			Moisture	Permeability	Compr. Strength lb/scuare inch
	Sample 1	Sample 2		Sample 1	
Retained on 12	--	0.22	4.1	2.8	5.5
20	0.02	0.28	6.1	4.0	5.8
30	0.04	0.34	8.0	5.4	7.1
40	0.10	0.78			
50	0.70	2.24		Sample 2	
70	3.80	6.34	4.1	4.9	6.5
100	11.06	12.18	6.1	7.3	7.0
140	17.16	15.78	8.0	9.7	6.7
200	14.18	12.00			
270	13.18	10.74			
through 270	30.12	24.74			
clay substance	9.8	14.5			

GRANBY Township, Shefford county
Range VII, lots 22, 23
Ref.: 2, 1936-E, p.37

The deposit lies at the west end of range VII, near the boundary line of Shefford and Rouville counties. The sample below is a composite from several localities in a quarter mile radius. The average thickness is one foot under six inches of soil. The reserves are probably large.

Granulometric		Moisture	Permeability	Strength lb/square inch
Retained on 6	6.01	6.0	40.6	8.1
12	7.03	8.2	59.5	8.0
20	10.36	10.2	69.2	6.2
40	17.08			
50	10.33			
70	10.61			
100	6.79			
140	4.13			
200	3.96			
270	0.44			
through 270	7.28			
clay substance	15.75			

GRENVILLE Township, Argenteuil county

Range IV, lot 7B

Ref.: 5, no.2135, 1946

Two samples were collected by L.H. Cole near the granite quarry of Scotstown Granite Co. near Grenville; these samples were submitted to the Ore Dressing and Metallurgical Laboratories in Ottawa and tested for their possible suitability as foundry sand. Sample 1 was obtained under nineinches of top soil and represents 18 inches of moulding sand beneath the soil, sample 2 represent the next ten inches of sand underlying sample 1.

Granulometric

	Sample 1	Sample 2
Retained on 16	0.3	0.8
20	1.2	1.0
30	1.5	1.5
40	1.5	1.7
50	2.2	2.5
70	4.0	4.2
100	6.0	5.2
140	11.1	7.4
200	21.1	16.8
270	16.1	13.5
through 270	28.5	36.5
clay substance	6.5	8.9

The permeability varies little for various moisture up to 11 per cent. For sample 1 it is about 16 and for sample 2 about 10.0. The grow compression strength has a maximum value of 5.7 for sample 1 and 6.0 for sample 2.

HATLEY Township, Stanstead county

Range VIII, lot 13

Ref.: 1, no.707, p.56.

A sample was collected by C.H. Freeman representing several small exposures of moulding sand along the highway between Ayer's Cliff and Magog. The area appears to be good prospecting ground for such sands.

Granulometric		Moisture	Permeability	Strength lb/square inch
Retained on 12	2.10			
20	5.20	3.9	7.9	3.1
30	5.99	6.0	14.4	5.3
40	7.84	7.9	23.7	6.0
50	13.84			
70	18.02			
100	17.58			
140	11.24			
200	4.64			
270	3.09			
through 270	4.98			

clay substance 5.4

HOPE Seigniory, Berthier county

St.Pierre Parish, 5 miles north of St. Gabriel de Brandon

Ref.: 1, no.767, p.48.

The layer of moulding sand from which this sample was taken is one to two feet thick and lies under 4 to 9 inches of overburden. The area seems to be good prospecting ground for this type of sand.

Granulometric		Moisture	Permeability	Strength lb/square inch
Retained on 20	0.06			
30	0.14	4.6	5.1	3.7
40	0.57	6.3	8.7	4.3
50	2.05	8.2	9.6	5.0
70	4.74			
100	5.91			
140	6.53			
200	8.38			
270	15.20			
through 270	53.14			
clay substance	3.9			

ILES DE LA MADELEINE County

Amherst Island

Ref.: 3 (G.W. Waddington, 1947; P.E. Bourret, 1947); 4, 1947, p.49; 5, no.2116, 1946.

Foundry sand was investigated at many places on Amherst Island in 1947, especially on lot 130 on the north shore, at seven places along the south shore of Baie de Plaisance and on lot 455 in the northwest part of the island.

Tests made on several samples have shown that the sand is satisfactory for brass, bronze or light grey iron foundry work. It is estimated that on lot 130 alone, about 80,000 tons of moulding sand rests under a thin cover (less than 2 feet) of wind blown sand and hard pan. Other deposits may be equal in size or larger than that of lot 130.

Chemical analyses of these sands show little variation from one location to the other, the SiO_2 content varies from 85.21% to 86.26%, the Al_2O_3 from 5.83% to 6.67%, Fe_2O_3 from 1.88% to 2.45%.

The mechanical analysis made on three samples from the south shore of Baie de Plaisance and the fourth from the northwest corner of Amherst Island are as follows.

GRANULOMETRIC

	Sample 1	Sample 2	Sample 3	Sample 4
Retained on 6	0.1	0.3	0.5	0.0
12	0.5	0.1	0.2	0.0
20	0.2	0.1	0.1	0.0
30	0.2	0.2	0.2	0.0
40	0.0	0.0	0.1	0.0
50	0.9	1.9	1.2	0.3
70	6.6	7.5	6.2	4.6
100	13.6	13.8	14.1	12.2
140	20.4	19.0	20.3	19.0
200	29.4	28.9	31.3	39.9
270	8.0	9.7	8.3	10.1
through 270	13.1	10.9	10.5	9.7
clay substance	6.0	7.6	5.9	4.0

	Moisture	Permeability	Strength lb/square inch
	1.9	19.8	6.5
Sample 1	3.9	21.0	4.2
	5.8	18.9	3.3
	1.9	18.0	9.1
Sample 2	4.4	18.5	4.7
	6.6	16.9	3.7
	2.3	20.7	8.9
Sample 3	3.7	21.0	5.4
	5.8	18.8	3.7
	2.8	22.9	9.1
Sample 4	4.1	21.8	5.8
	5.9	19.8	4.0

LAC DES DEUX MONTAGNES Seigniory, Deux Montagnes county
Saint Canut Parish, Rivière du Nord Concession, South
Ref.: 2, 1936-C, p.58.

Several deposits of moulding sand are found near the river from about 2.0 miles east of Canuta and extending for 1.5 miles eastward. The deposits vary in size some of them having reserves of up to 5,000 cu. yards. The sands are grey, fine grained, with high clay content. Sample 1 below comes from a deposit at the western end of the occurrence and sample 2 from the eastern end.

Granulometric	Sample 1	Sample 2	Moisture	Permeability Sample 1	Compr. Strength lb/square inch
Retained on 40	0.05	0.04	4.2	6.3	7.0
50	0.78	0.17	5.8	10.8	7.3
70	2.69	1.00	7.9	14.8	6.0
100	17.20	11.58	9.6	15.5	5.1
140	23.02	20.30			
200	20.99	23.32		Sample 2	
270	4.72	5.53	4.8	3.5	7.6
through 270	19.58	25.49	6.5	5.6	7.8
clay substance	10.69	12.56	8.2	6.0	8.5
			9.4	7.6	7.9

L'ASSOMPTION Seigniory, l'Assomption county

Parish of l'Assomption, Range Cote Nord du Bas de l'Assomption, lot 463

Parish of Repentigny, lot 173

Ref.: 1, 767, p.53; 2, 1933-A, p.83; 5, no.2135

A terrace deposit occurs on lot 463 where moulding sand was obtained during a period of at least 20 years prior to 1933. This sand was investigated in the ore dressing laboratories in Ottawa in 1946 and found to be of good permeability and durability but with low refractoriness for iron foundry use. On lot 173, another deposit has furnished sand for a stove foundry.

Sample 1 below, comes from lot 463 in that part of the deposit which has been worked, sample 2 comes from a nearly location to the west of the working place.

Granulometric			Moisture	Permeability	Compr. Strength lb/square inch
	Sample 1	Sample 2		Sample 1	
Retained on 20	0.13	--	4.0	7,9	3.5
30	0.17	0.01	5.9	12.1	3.7
40	0.16	0.03	7.9	13.8	4.7
50	0.44	0.25			
70	0.98	0.72		Sample 2	
100	7.11	5.44	4.0	9.3	4.6
140	17.78	16.46	6.1	12.8	4.9
200	18.04	18.38	8.0	14.1	5.6
270	16.74	19.26			
through 270	29.14	30.94			
clay substance	9.5	9.0			

MONNOIR Seigniory, Iberville and Rouville counties

Ref.: 1, no.767, pp.51-52, 1936-E, p.36.

Several deposits were sampled in the vicinity of Mount Johnson. Samble 1 below, was taken by H.W. McGerrigle from a layer 1.5 feet thick under 1.5 feet of soil on the south side of Mount Johnson, St. Gregoire Le Grand Parish, range de la Montagne, lot 166. The same layer was sampled by Freeman with different results as seen in sample 2 below. The sand is coarse but it is low in clay and contains slate grains. The reserves would be large. Sample 3 is from a gravel pit 2.5 miles N-W of Mount Johnson Village, the layer of moulding sand is 12 to 18 inches thick under 6 to 8 inches of soil, the clay content is low. Sample 4 is from St. Angèle parish, range Côte Double, lots 940, 941, 1.5 miles west of Rougemont; the moulding sand here is in irregular patches averaging 6 inches thick under 6 inches of soil.

GRANULOMETRIC

	Sample 1	Sample 2	Sample 3	Sample 4
Retained on 6	1.94	--	--	1.20
12	3.35	1.30	--	4.58
20	10.66	14.01	0.16	5.74
40	33.29	46.84	4.24	15.32
50	19.43	14.91	19.91	12.54
70	15.96	5.78	46.08	10.97
100	6.54	2.26	21.92	8.05
140	1.68	1.14	3.42	5.89
200	1.09	0.66	0.51	6.68
270	0.05	0.78	0.31	0.49
through 270	1.71	3.28	0.81	13.48
clay substance	4.10	8.7	2.2	14.69

	Moisture	Permeability	Compr. Strength lb/square inch
	4.5	351.7	1.5
Sample 1	6.5	316.6	1.4
	8.0	334.2	1.2
	4.1	22.1	3.7
Sample 2	5.9	58.9	4.7
	8.0	299.0	2.6
	4.0	98.5	2.6
Sample 3	6.0	149.0	1.8
	7.9	175.2	1.2
	5.0	4.2	9.2
Sample 4	6.6	5.5	10.0
	8.4	11.1	9.8

NEUVILLE Seigniory, Portneuf county

At Pont Rouge, along the side of the Jacques Cartier River.

Ref.: 1, 767, p.55; 2, 1933-A, p.83.

This moulding sand has been used from 1884 to 1924 by Chas. A. Julien who manufactured gazoline engines and other heavy objects. La Fonderie Suprême took over the plant in 1924 and continued operations for some time. The foundry changed hands several times until about 1957 when it was closed down; at that time, the sand deposit was exhausted and the foundry had to purchase sand in its last years of operation. More recently, Zephirin Laroche & Frêres Ltée has operated a foundry near Pont Rouge using sands from several nearby deposits. The analysis below is from a sample collected by C.H. Freeman in 1928.

Granulometric		Moisture	Permeability	Strength lb/square inch
Retained on 20	0.58	4.0	4.2	5.3
30	0.38	6.0	6.1	6.3
40	0.45	8.1	8.4	7.9
50	1.88			
70	2.33			
100	7.48			
140	12.32			
200	14.79			
270	17.00			
through 270	37.67			
clay substance	4.4			

ROUVILLE Seigniory, Rouville county

St.Paul d'Abbotsford Parish, St. Joseph Range, lots 25, 32

Ref.: 2, 1936-E, p.39.

Three samples were collected within 1/4 mile of Abbotsford Station, sample 1 from the S-W part of the area, sample 2 from the N-W and sample 3 from the east. Quartz predominates in these samples with more or less feldspar, basic minerals and, at places, mica and magnetite. At least 5,000 cu. yards are available at each of these three locations.

GRANULOMETRIC

	Sample 1	Sample 2	Sample 3
Retained on 6	--	0.04	0.63
12	0.04	0.24	0.30
20	0.71	0.89	1.52
40	3.08	8.28	16.80
50	3.65	12.91	20.11
70	5.68	21.05	19.96
100	10.73	20.95	14.29
140	12.10	13.27	8.36
200	16.06	8.24	4.18
270	3.28	0.94	0.25
through 270	28.66	6.78	4.17
clay substance	15.74	6.25	9.07

	Moisture	Permeability	Compr. Strength lb./square inch
	4.3	3.7	9.42
sample 1	6.0	6.5	9.37
	8.0	7.8	8.1
	5.2	21.4	5.45
sample 2	7.0	30.9	6.0
	8.5	41.0	5.5
	4.5	68.4	4.4
sample 3	6.0	78.2	3.7
	7.0	89.8	2.2

Elmire Range, lot 70

Montagne Sud Range, lot 117 N½

Ref.: 2, 1936-E, pp. 36, 40

Sample 1 below, is from lot 70, 1¼ mile west of Abbotsford. The sand is low in clay and high in feldspar. The sand ridge is 1,500 feet long and 500 feet wide. Interbedded yellow and grey sands occur in beds totalling 25 feet in thickness.

Sample 2 is from lot 117 in the southeast corner of Yamaska mountain. The deposit measures more than 13,000 square yards in area and its thickness is about 1.5 feet under 4 to 6 inches of soil.

Granulometric			Moisture	Permeability	Compr. Strength lb./square inch
	Sample 1	Sample 2		Sample 1	
Retained on 6	0.20	1.95	6.0	150.5	1.48
12	0.39	3.87			
20	1.94	4.85		Sample 2	
40	16.23	9.43	4.5	6.7	8.25
50	15.82	9.32	6.5	9.5	8.3
70	25.17	15.67	8.2	13.9	8.1
100	20.55	15.12	10.2	19.0	7.8
140	7.26	7.46			
200	4.51	6.59			
270	0.28	1.67			
through 270	3.03	10.85			
clay substance	4.11	12.88			

St. Hilaire Parish, Range des Etangs, lots 378-395

St. Jean Baptiste Parish, Range I, lots 143, 144, 147, 178, 179

Sample 1 (below) was collected near a cross-road 3/4 mile southeast of Mont St. Hilaire Village, the extent of the deposit and the reserves are not known.

Sample 2 was collected four miles south of Mont St. Hilaire. This sand is low in clay, it occurs over a length of several hundred feet and a width of more than 300 feet at the top of a terrace bordering the river Des Hurons.

Granulometric			Moisture	Permeability	Compr. Strength lb./square inch
	Sample 1	Sample 2		Sample 1	
Retained on 6	1.56	--	6.8	34.6	8.5
12	2.18	0.15	8.5	36.9	7.5
20	3.11	0.28	10.3	33.0	6.3
40	10.70	4.90			
50	11.23	11.16		Sample 2	
70	17.21	32.32	4.5	134.9	2.4
100	16.78	31.57	6.5	134.9	2.2
140	7.15	8.59			
200	5.49	2.72			
270	0.14	0.27			
through 270	6.99	1.84			
clay substance	10.95	5.60			

ROXTON Township, Shefford county.
Range X, lot 16
Range XI, lot 17
Ref.: 2, 1936-E, pp. 19, 20.

On lot 16, range X, the deposit of moulding sand measures 1200 feet in length and 150 in width on the east side of Black River. The thickness varies from one to four feet. The coarse fraction of the sand contains much slate, feldspar and mica (see sample 1 below). On lot 17, range XI, two miles north of Roxton Falls, the sand is medium grained and contains a high percentage of slate (sample 2).

Granulometric			Moisture	Permeability	Compr. Strength lb./square inch
	Sample 1	Sample 2		Sample 1	
Retained on 6	--	0.21	4.8	9.6	4.7
12	0.07	0.61	6.4	11.5	6.3
20	0.12	3.52	7.9	11.7	5.8
40	1.26	17.62	9.5	11.8	5.5
50	3.41	25.40			
70	7.87	30.99		Sample 2	
100	15.11	12.65	4.2	22.6	1.2
140	16.15	3.55	6.00	22.6	1.2
200	19.41	1.51	7.1	24.3	1.1
270	4.92	0.24	8.2	18.8	1.0
through 270	20.53	1.47			
clay substance	10.79	2.38			

STE ANNE DE LA PERADE Seigniory, Champlain county

Ste-Marie Range, 3.5 miles north of Ste.Anne de la Pérade

Ref.: 1, 767, p.48.

The sample taken at this location comes from a layer 12 to 16 inches thick under 9 inches of soil. Other similar occurrences are found nearby (see analysis below)

Granulometric		Moisture	Permeability	Compr. Strength LB./square inch
Retained on 12	0.21	4.0	10.4	6.9
20	1.62	6.0	10.8	7.3
30	2.78	8.1	12.3	5.8
40	3.74			
50	5.00			
70	6.60			
100	10.85			
140	13.33			
200	10.29			
270	10.82			
through 270	29.64			
clay substance	5.2			

ST. HYACINTHE Seigniory, St. Hyacinthe and Bagot counties

Ref.: 1, no.767, p.57; 2, 1933-A, p.82; 2, 1936-E, pp. 24-28; 5, no. 2135

Several deposits of moulding sand have been discovered in the vicinity of St. Hyacinthe especially along the Yamaska River. Some of these have been developed and have furnished sand to the foundries of the region.

Probably the best known deposit was on lots 59 and 61, Yamaska River range, about two miles north of St. Hyacinthe on the west Bank of the Yamaska River. A sample from this deposit was thoroughly tested in the ore dressing laboratories in Ottawa in 1946 and found to have good permeability toughness and durability but insufficient refractoriness with a sinterring point below 2200°F.

The sand was used in three foundries near and in St. Hyacinthe. It occurs in lenticular beds ranging in thickness from 2 to 18 inches under 6 to 10 inches of soil. Samples 1 and 2 are from this deposit no.1 was collected by C.H. Freeman in 1929 and no.2 was sent from stockpiles of a foundry in St. Hyacinthe. Sample 3 and 4 were collected by H.W. McGerrigle from the south and north ends of the pit respectively. Sample 5 is from the east side of Yamaska River on lot 194.

GRANULOMETRIC

	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
Retained on 6	--	--	--	--	--
12	--	--	0.01	--	0.01
20	0.12	--	0.03	0.01	0.01
40	0.68	1.04	0.12	0.09	0.01
50	1.38	1.92	0.24	0.73	0.40
70	4.80	5.00	0.80	3.78	1.37
100	11.86	12.96	2.49	12.43	0.48
140	15.78	14.48	4.70	16.31	15.02
200	12.52	11.98	14.06	21.14	22.50
270	12.10	11.62	5.41	2.74	6.29
through 270	27.78	26.72	43.52	27.66	29.29
clay substance	13.5	13.5	28.41	14.95	15.17

	Moisture	Permeability	Compressive Strength lb/ square inch
	3.9	7.2	5.1
Sample 1	5.8	10.7	5.9
	7.8	13.7	5.6
	4.2	6.6	5.9
Sample 2	6.0	11.0	5.5
	8.0	13.7	4.8
	4.8	0.9	10.5
Sample 3	6.8	1.4	11.7
	8.4	1.7	11.2
	10.3	2.2	10.5
	4.1	4.2	7.8
Sample 4	6.2	8.2	7.5
	7.7	8.8	6.4
	9.0	10.5	5.5
	6.0	6.0	8.2
Sample 5	7.6	7.2	7.0
	9.6	7.5	7.3

On lots 226, 227, St. Dominique range N.E., about 5 miles south of St. Hyacinthe there has also been some production of moulding sand. The deposit is from 2 to 4 feet thick. Sample 6 below is a mechanical analysis of this sand.

In St. Charles Parish, lot 199, range II and in range V, 2 miles N.W. of Ste. Madeleine, samples were taken from the record although they do not show good moulding sand qualities (see sample 7 and sample 8 below).

In Côte Nord range, lots 1108 and 1101, samples collected show a predominantly quartz sand with basic minerals, feldspar and mica as common accessories. Sample 9 and sample 10 are from lots 1108 and 1101 respectively; the second deposit is said to have yielded some sand for foundry work.

GRANULOMETRIC

	Sample 6	Sample 7	Sample 8	Sample 9	Sample 10
Retained on 6	--	--	--	--	--
12	--	0.17	0.12	0.01	--
20	0.2	0.12	0.27	--	0.01
40	4.4	0.17	1.72	0.02	0.16
50	--	0.49	3.59	0.10	0.89
70	35.2	7.03	14.85	0.81	6.40
100	49.2	53.48	36.01	4.48	18.28
140	6.8	24.71	21.61	9.14	14.93
200	1.6	5.80	5.61	18.05	16.15
270	0.2	0.41	0.01	1.28	0.19
through 270	0.8	1.82	3.92	40.95	25.25
clay substance	1.6	5.19	11.96	24.8	17.58

	Moisture	Permeability	Compr. Strength lb./square inch
Sample 7	6.0	95.9	1.5
	6.4	51.8	4.7
Sample 8	7.8	52.8	3.5
	9.1	47.5	2.5
	4.4	2.2	11.3
	6.0	2.9	12.4
Sample 9	7.8	3.6	10.9
	9.4	4.2	9.7
	4.2	4.9	10.3
Sample 10	6.2	5.5	10.8
	8.0	7.6	9.0

A large deposit of moulding sands is found in Ste. Rosalie parish, range I, lot 26, five miles down Yamaska River from St.Hyacinthe. The flat measures 3,000 feet in length and up to 600 feet in width. The sand is light brownish-gray with high clay content. Sample 11, below, is from the southern half of the flat.

On lot 535, range III, St. Denis parish, three miles south of St. Denis a medium grained sand in a layer five to six feet thick contains little clay and many slate particles. It is not a good moulding sand (see sample 12 below).

In the parish of St. Jude, S.W. concession, lot 108, 1.5 mile N.W. of St. Jude, a large area of sand in a layer more than 5 feet thick at places is unfortunately low in clay and cannot be considered a natural moulding sand. Quartz predominates but there is also much mica and magnetite (see sample 13 below).

Another interesting location is St. Pie parish, N.E. range, lot 438 on the east side of rivière Noire just below St. Pie. More than 20,000 cu. yards could be obtained here but the sand is high in basic minerals mica and vegetable matter (see sample 14 below).

GRANULOMETRIC

	Sample 11	Sample 12	Sample 13	Sample 14
Retained on 6	---	0.08	0.19	---
12	0.08	0.65	0.12	---
20	0.03	7.05	0.11	0.01
40	0.19	39.60	0.45	0.35
50	0.54	27.52	0.88	1.31
70	1.96	16.39	1.84	5.78
100	6.48	3.23	13.85	16.04
140	10.58	0.33	48.49	17.50
200	19.20	0.25	23.31	23.09
270	5.96	0.03	2.08	1.01
through 270	32.41	0.50	4.68	26.39
clay substance	22.00	4.13	3.58	8.34

	Moisture	Permeability	Compr. Strength lb./square inch
	6.2	4.4	10.1
Sample 11	8.0	5.4	9.8
	9.6	5.9	8.6
	4.0	477.3	0.5
Sample 12	6.0	414.2	0.5
	5.2	11.4	4.1
	6.1	13.4	4.4
Sample 14	7.5	13.9	4.7
	9.1	13.3	4.6

ST. SULPICE Seigniory, L'Assomption county

About 1.5 mile S.W. of St. Sulpice, one mile north of the St. Lawrence

Ref.: 1, 767, p.52.

Some sand was recovered for foundry purposes at this location but there are many spots in this vicinity where suitable moulding sand could be found. Sample 1, below, comes from the excavation and sample 2 from a point 620 feet to the northwest; the thickness of the sand layers is 12 to 15 inches under 9 inches of soil.

Granulometric			Moisture	Permeability	Compr. Strength lb./square inch
	Sample 1	Sample 2		Sample 1	
Retained on 30	0.40	0.06	4.0	8.8	4.8
40	0.04	0.30	5.9	11.5	5.6
50	0.32	0.17	8.0	12.9	5.1
70	0.78	0.29			
100	5.56	1.58		Sample 2	
140	15.12	12.00	3.9	7.1	4.7
200	20.23	19.48	6.2	11.2	5.0
270	20.10	21.78	7.9	10.8	5.7
through 270	28.66	35.86			
clay substance	8.8	9.0			

SOREL Seigniory, Richelieu county
1/4 mile S.E. of railway crossing on no.3 highway
3.5 miles east of Sorel on no.3 highway
Ref.: 1, 767, pp. 55, 56.

At the first location within the city limits, a sand deposit was used for many years by the early foundrymen at Sorel. The sand is coarse grained and does not contain sufficient clay for this type of sand (see sample 1 below).

The second location is along the banks of the Pot-au-beurre river; the layer of moulding sand is 6 to 13 inches thick under 10 to 12 inches of soil (sample 2 below).

Granulometric			Moisture	Permeability	Compr. Strength lb./square inch
	Sample 1	Sample 2		Sample 1	
Retained on 12	--	0.48	3.9	27.9	1.5
20	--	4.30	6.2	48.0	2.3
30	0.10	10.50	8.0	64.0	2.9
40	0.16	19.08			
50	1.24	21.74		Sample 2	
70	14.60	13.80	3.9	22.4	4.6
100	35.04	5.84	5.8	41.0	5.2
140	29.20	2.12	7.8	56.8	2.5
200	10.14	1.14			
270	4.22	1.80			
through 270	2.84	11.28			
clay substance	2.6	8.2			

UPTON Township, Bagot county

Range XVIII, lots 64, 65

Range XXI, lots 59, 60

Ref.: 2, 1936-E, pp. 20, 23

The deposits in range XVIII lie on the west side of rivière Noire about 3.5 miles south of Upton Village. Sample 1 below represents a yellow-brown sand occurring in a layer averaging one foot in thickness and covering about 30,000 square yards. Sample 2 represents another

deposit a short distance west of the preceeding, the layer is thicker but covers a much smaller area, the sand is coarser and there is less clay.

The deposit in range XXI lies near the west shore of rivière Rolland about 3 miles southeast of Upton. The sand layer averages two feet thick and extends along the river for about 0.5 mile over a width of 200 feet, the cover of soil is about one foot thick. Sample 3 and sample 4 were taken at 2 different locations in this deposit to show the uniformity in mechanical properties.

GRANULOMETRIC

	Sample 1	Sample 2	Sample 3	Sample 4
Retained on 12	0.09	0.36	--	--
20	0.78	0.78	0.02	0.02
40	0.65	2.17	0.17	0.81
50	0.47	7.97	1.35	2.44
70	1.29	22.81	3.84	5.37
100	3.32	25.99	12.65	11.70
140	5.12	10.30	15.04	13.34
200	13.38	8.92	20.01	17.24
270	6.48	2.82	5.36	4.85
through 270	49.15	12.34	25.58	26.71
clay substance	18.84	5.32	15.47	17.23

	Moisture	Permeability	Compr. Strength lb./square inch
Sample 1	5.1	1.4	8.1
	6.8	2.3	9.4
	8.8	3.1	9.7
	10.8	3.6	9.0

	Moisture	Permeability	Compr. Strength lb./square inch
Sample 2	4.5	46.5	2.5
	6.0	51.8	2.4
	7.9	50.1	2.1
	9.9	46.4	1.9
Sample 3	4.2	2.5	8.6
	6.2	3.9	9.3
	8.0	5.2	8.6
	10.4	6.0	7.6
Sample 4	5.9	3.9	9.3
	8.0	4.7	9.3
	10.0	5.1	8.5

VERCHERES Seigniory, Verchères county

Verchères Parish, Range IV, lot 450

Ref.: 2, 1936-E, p.29.

Moulding sand occurs in a bed 1.5 feet thick under 6 inches of soil, the extent of the deposit is not known. The sand is light brownish-gray and fine grained (see analysis below)

Granulometric		Moisture	Permeability	Compr. Strength lb./square inch
Retained on 6	0.32			
12	0.11	3.8	11.1	5.3
20	0.52	4.8	20.1	5.0
40	4.28	7.5	21.5	5.0
50	8.04	8.2	21.8	5.0
70	17.51			
100	19.28			
140	9.63			
200	9.22			
270	1.34			
through 270	22.03			
clay substance	7.55			

SILLIMANITE GROUP OF MINERALS

The minerals sillimanite, kyanite and andalusite have the same molecular formula Al_2O_3 SiO_2 (62.9% Al_2O_3 and 37.1% SiO_2). Because of their high content of alumina, they are precious meterials in the refractory industry. Despite their widespread occurrence in Canada and especially in the Grenville sub-province, they are not produced mainly because of the low percentage of the minerals in the rocks and because of the difficulties of complete beneficiation to obtain a pure concentrate. Other minerals of this group include mullite ($3\ Al_2O_3 .\ 2\ SiO_2$) which is a rare mineral of sillimanite and other minerals of the group; dumortierite, topaz and pinite also yield mullite by calcination.

In Quebec, the sillimanite minerals occur in paragneisses associated with muscovite, garnet, biotite, quartz and feldspar. They have been found in contact metamorphic zones notably in the Bushveld igneous complex of South Africa, in hydrothermal veins and pegmatites and in sedimentary rocks of south Carolina and Georgia. The most important deposits in the world in southeastern Bihar, India consist of massive kyanite associated with a quartz kyanite rock.

The main difficulty is to determine what constitutes an economic deposit of these minerals; the grade, the associated minerals, the ease of beneficiation, the distance to consuming centres

are all important factors which must be taken into account. The size of the crystals is also important since the cost of beneficiation will increase greatly if very fine grinding is required to liberate the particles; furthermore, a very fine product will often require agglomeration before being used in the manufacture of refractory bricks.

Synthetic mullite was produced initially in the United States around 1917 but in 1951 the capacity of the industry was only about 2,000 tons per year; since then, the production has increased steadily to 40,228 tons valued at $4,811,000. in 1967. Canada imports yearly more than 5,000 tons of sillimanite minerals (crude or calcined), mostly from the United States.

Imported kyanite of 60 per cent Al_2O_3 grade may cost from $79.00 to $84,00 per ton at Atlantic ports (according to Metals Week 1967).

Mullite refractories are in demand especially because of their great resistance to thermal shock; the compound is stable with low coefficient of expansion up to temperatures of 3270°F. About 90 per cent of the mullite produced in the U.S. is used in the glass and metallurgical industries.

Only one deposit of kyanite in Quebec has received serious attention as a possible producer, that is in Campeau township, Temiskaming county, where North American Refractories has bone considerable

work since 1967 to bring this deposit into production. There are numerous other occurrences of sillimanite minerals in Quebec, none of which has been considered as a possible source of the minerals but some deserve mention as possible future sources or as prospecting areas. Some areas in the Grenville sub-province consist mostly of sillimanite-garnet gneisses of fairly uniform composition, but their sillimanite content is generally low and the only possibility of production would be to find zones of concentration of these minerals in the gneisses. In the following nomenclature, the areas in the Grenville which are described in the litterature as sillimanite-garnet gneiss localities are not all mentioned since the list would be too long; the localities which are described as unusual in their development of sillimanite are mentioned.

Principal References

(1) Quebec Department of Mines, P.R.

(2) Quebec Department of Mines, G.R.

(3) Canada Department of Mines, Mines Branch, Publication

(4) Geological Survey of Canada, Annual Report

(5) Geological Survey of Canada, Memoire

(6) Quebec Department of Natural Resources, office files

(7) Mining Operations in the Province of Quebec

(8) Quebec Bureau of Mines, Annual Report.

AUMOND Township, Gatineau county

Ref.: 1, no.183, p.5.

Garnet-sillimanite gneisses are particularly well developped in this township.

BOISCLERC Township, Temiskaming county

Ranges VII, VIII

Ref.: 3, no.677, p.25; 4, N.S. VII, p.56-A.

At Snake Creek and Rapide Les Erables a garnet-biotite gneiss contains thin-bladed, blue to green crystals of kyanite, abundant in places. Similar occurrences are frequent in the general area.

CAMPEAU Township, Temiskaming county

10 miles S.E. of Temiscaming.

Ref.: 5, no.103, p.75 (F); 6, (O.D. Maurice, 1968, Jean Dugas 1968).

Kyanite has been known to occur in the garnetiferous paragneisses near the shores of lake Temiskaming since about 1890. In 1951, attempts were made to develop some extensive deposits found some 20 miles N-W of Mattawa, Ontario. Many concentration tests were made at the Mines Branch in Ottawa followed by ceramic investigations, no production was recorded probably because of the low content of kyanite in the rock and the difficulty of marketing by-products such as mica and garnet which occur abundantly with the kyanite.

The deposits of Campeau township are similar to those of Mattawa. They were prospected and developped from 1967 by North American Refractories Company (Narco) who constructed a mill capable of treating about 250 tons of ore per day. All work was suspended in 1969 pending further study of the deposit and of milling methods. A successful operation would require the marketing of by-products such as garnet and muscovite.

CHAVIGNY Township, Portneuf county

Range I, lot 6 SW

V, lot 7 N.E.

VI, lots 7-9 S.W.

Ref.: 7, 1915, p.116.

A good description of the sillimanite-garnet gneisses occurring generally throughout the Grenville sub-province appears in the reference above together with photographic illustrations; the sillimanite is abundant in some places but does not constitute an exploitable ore body in any of these.

DESJORDY Township, Saguenay county

Near outlet of Gentilhomme Lake

Ref.: 2, 1929, p.55.

Extensive formations of quartz-mica-kyanite schists occur in this remote part of the province which may become more accessible with

the development of the Mount Wright iron deposits. The kyanite in these rocks generally make less than 5% of the outcrop but some enriched zones over 100 feet wide and containing 25 per cent kyanite were observed near the outlet of Gentilhomme Lake.

DE RAMSEY Seigniory, Joliette county

At St. Jean de Matha

Ref.: 4, VIII, J, pp. 53, 54, 1896 (F); 3, no.677, p.20.

Sillimanite-garnet gneisses form thick bands about one mile west of the church of St. Jean de Matha. The crystals of sillimanite are .05 to .25 mm. in diameter and up to 1.1 mm. long.

FABER Township, Saguenay county

Ref.: 2, 129, p.55.

Near the east boundary of Faber township, many large blocks of a rock containing about 20% kyanite associated with garnet are found. These blocks are believed to be at or near their original position but no outcrops were found.

GENDREAU Township, Temiskaming county

North shore of Birch Lake

Ref.: 5, 103, p.75 (F).

Another occurrence of garnetiferous gneiss with kyanite is found in this township on the north shore of Birch Lake. The association of minerals in the rock is quite similar to the many other ocurrences in the district extending from Mattawa northward to Fabre township.

GRANDISON Township, Terrebonne county

Ref.: 4, VIII J, pp. 54-55.

On the south and west shores of Lake Tremblant are exposed a large variety of sillimanite-garnet gneisses which are composed essentially of quartz feldspar and biotite in addition to sillimanite and garnet.

GUESLIS Township, Saguenay county

Ref.: 2, 129, p.55.

Near the west boundary of Gueslis township, the occurrence of large blocks of a kyanite rich rock is noted. Pink garnets constitute about 15% of the rock and kyanite about 20 per cent.

KILDARE Township, Joliette county

South shore of Lac-des-Français

Ref.: 2, 92, p.11; 4, VII J, p.52.

Abundant outcropings of sillimanite-garnet paragneisses are to be found within an area some 5 miles in diameter centering on Lac-des-Français, in Kildare township. On the south shore of this lake "sheaves of crystals measuring 4 inches in lengths were collected". A Rosiwal analysis of a medium-grained specimen gave the following proportions (by weight)

Garnet	15.3%	Microcline-perthite	24.6%	Sillimanite	27.1%
Quartz	36.8%	Opaques and accessories	1.2%		

The above analysis must not be considered representative of the average sillimanite-garnet gneiss.

SUZOR Township, Laviolette county

At Alex Lake

Ref.: 8, 1936-B, p.29.

The Grenville paragneisses at the head of Alex Lake are said to contain much sillimanite in crystals visible to the naked eye.

TOWNSHIP 1274, Duplessis county

Near Boucher Lake

Ref.: 2, 19, p.11.

A sample of gneiss collected along the Romaine River west of the north end of Boucher Lake contained 5 per cent sillimanite and 20 per cent cordierite in addition to quartz and biotite.

SLATE

When an argillaceous rock such as a shale is metamorphosed by heat and compression, it assumes a platy texture and becomes a slate. Slates are generally easy to separate along their natural cleavage faces giving flat surfaces. They have thus been used extensively as roofing material, as black-boards and bulletin boards, as billiard table tops, as flagstones, floor tiles, steps and other building materials. Because of their high dielectric strength, they have been used for electric panels and switchboards. Their bloating properties under heat are made use of in the manufacture of lightweight aggregates.

Roofing was for a long time the main use of slates, they are an ideal material for that purpose and there are many examples of slate roofs dating back to the eighth century which are still weather resistant and compact. But because of the high cost of quarrying and the difficulty of using the enormous quantities of waste near the quarries, the material has lost its favor among builders who prefer cheaper materials such as sheet metal, wood stringles or asbestos cement stringles.

In the United States, the value of slate produced in recent years compares well with the best years of production in the 1920's and 1930's mainly because of the increase in the production of flagstones, walkways, stepping stones electrical and sanitary uses. It is possible

that our slate quarries, which are idle at the present time, will be reopened to furnish the demand for these products for which slate is so well suited.

It is therefore thought important to list the areas of occurrence and to give references where more information can be obtained.

PRINCIPAL REFERENCES

(1) Canada Department of Mines, Mines Branch no.

(2) Department of Natural Resources, Quebec, Document no.

(3) Mines & Minerals of the Province of Quebec, 1889

(4) Bulletin des Recherches Historiques

(5) Geological Survey of Canada, Report

(6) Mining Operations in the Province of Quebec

(7) Department of Natural Resources, Quebec, P.R. no.

LIST OF OCCURRENCES

ACTON Township, Bagot county

Range V, lot 26

Ref.: 1, no.279, p.244; 2, GM-4085, p.9; 3, p.150.

The quarry known as the Rankin Hill operated between 1875 and 1878. The slate belongs to the Sillery formation, some of it is very red and uniform, it is said to be easily quarried. Some 600 squares of slate were produced in 1877.

BOTSFORD Township, Temiscouata county

Range VIII, lots 39-41

Range IX, lots 39-42

Ref.: 1, no.279, p.249; 2, GM-4085, p.13; 2, GM-6774.

The firm of Frazer and Davis operated this quarry between 1910 and 1915 and produced about 400 squares of roofing slate. The workable slate belt measures 154 feet in width, it strikes N60°E and is almost vertical in dip. The slate has a very uniform dark gray colour which becomes lighter on weathering. It splits smoothly and evenly.

BROME Township, Brome county

Range III, lots 4, 5

Ref.: 1, no. 279, p.251; 2, GM-4085, p.12.

Smooth greenish slates occur on the south branch of the Yamaska River. Mr. H. Church of Sutton Jonction opened a quarry there in the 1880's to supply local needs. The production was small but the material appears to be of good quality.

BROMPTON Township, Richmond county

Range V, lot 29

Ref.: 1, no.279, p.248; 2, GM-4085, p.11; 3, p.150.

Dark blue slates were extracted here in the 1880's to supply local needs in flagstone. Quartz stringers are common in the slate exposed but many bands are free of this defect. The quarry was known as the "Innes".

BROMPTON Gore, Richmond county

Range X, lot 18

Ref.: 1, no. 279, p.240; 2, GM-4085, p.7.

A quarry was opened on this lot near Mud Pond in 1891, it was known as the Venkin's quarry. The stone is purple, splits easily, but was not considered sufficiently durable to warrant an exploitation.

CLEVELAND Township, Richmond county

Range IX, lot 6

Ref.: 1, no.279, p.236.

A small quarry was worked on this lot, the slate is dark and is part of the belt extending southwestward toward the village of Rockland where important quarries were worked.

Range XV, lot 6

Ref.: 1, no. 279, p.241; 2, GM-4085, p.7.

This is the oldest slate quarry in Quebec, it was opened in 1854 but owming to excessive quartz inclusions and the prohibitive amount of waste, the operations has a short life. It was known as the old Steele quarry and was later operated by J.C. Bedard. The slate is silvery gray and easy to split.

CRANBOURNE Township, Dorchester county

Ref.: 2, GM-4085, p.12.

Bands of red slate occur in the Beauceville formation of Ordovician age. They are associated with green sandstones. They have never been quarried.

FRAMPTON Township, Dorchester county

Range X, lot 2

Ref.: 1, no.279, p.252.

Purple, red and green slates occur in the Beauceville formation. A quarry was opened in the 1880's on lot 2, range X.

GARTHBY Township, Wolfe county

Range I S, lot 47

RangesVII, VIII, IX, lots 15

Ref.: 1, no.279, p.245

A broad band of slate crosses Garthby township in a N.E. direction. The slates are red, green or grayish. A small quarry in range IX was worked in the 1880's but other locations could show deposits of interest with careful prospecting.

GRANBY Township, Shefford county

Ranges VIII, IX, lots 14, 15

Ref.: 1, no.279, p.246; 2, GM-4085, p.10; 2, GM-10423.

The slate on lot 15 near the line separating ranges VIII and IX is deep red in colour. The belt is 300 feet wide and at least 1,000 feet long. A quarry was opened at this point by Moise Robert in the early part of the century but production was very small judging by the size of the opening. In 1958, J. Côté of Granby sold a small quantity of slate, taken from the dump to Industrial Fillers Limited.

A green slate was also worked on lot 14, range IX by Joseph Aubin of Granby. The material on the dump is not very fissile and the cleavage planes not very smooth.

GRAND ETANG Seigniory, Gaspé North county

Ref.: 4, vol. XVI, p.166, 185.

The outcrops of Ordovician slate and sandstone which are observed all along the north coast of the Gaspé Peninsula from Ste Anne-des-Monts almost to the eastern end of Gaspé attracted the attention

of the early explorers who were in search of such a material to cover roofs which were often at the origin of destructive fires. The quarrying activity was centered at Grand Etang where Doctor Michel Sarrazin discovered these slates on his property in 1728. Production was never important but the slate was used to cover a few houses in Quebec notably that of the Sieur de Levy and the Royal Stores. The slate did not split well and a considerable amount of waste accumulated near the quarry, furthermore, it did not resist the numerous periods of freezing and thawing.

HALIFAX Township, Megantic county
Range I, lot 14
Ref.: 5, 1863, p.830.

On this lot, an occurrence of slate of possible economic interest is mentioned.

JOLIETTE Seigniory, Dorchester county
At Ste. Hénédine, Ste. Thérèse Range
1¼ mile east of the village
Ref.: 6, 1932, p.62; 6, 1933, p.65; 6, 1934, p.67.

From 1932 to 1935, a small quantity of red slate was extracted from a quarry operated by Broughton Soapstone Quarry Co. Ltd. The rock was pulverized to 98% minus 300 mesh and sold in Montreal to manufacturers of paint and linoleum.

KINGSEY Township, Drummond county

Range I, lots 4, 5

Ref.: 1, no.279, p.243; 2, GM-4085, p.8.

A quarry was opened in 1857 on this lot and operated for two years. The slate is generally purple and the colour does not fade under weathering conditions. Excessive waste was caused by the tendency of the slate to part at right angles to the cleavage.

LANAUDIERE Seigniory, Bellechasse county

Between St. Lazare and north line of Frampton

Ref.: 2, GM-4085, p.12.

The red slates worked at Ste. Henedine in Joliette Seigniory are found outcroping south of St. Lazare.

LAUZON Seigniory, Dorchester county

St. Anselme parish, lots 238, 239

Ref.: 2, GM-4085, p.18; 6, 1921, p.70.

A crushing and grinding plant was built here in 1921. The slate is generally red with narrow green bands.

MELBOURNE Township, Richmond county

An important slate band crosses the eastern part of Melbourne township in a northeast direction; it is in this band that most of the activity in the Quebec slate industry has taken place.

Range II, lots 22, 23

Ref.: 3, p.150.

This location has not been quarried but it is mentioned as a possible site for slate extraction.

Range IV, lots 14, 23, 24

Ref.: 1, no.279, pp. 236-241; 2, GM-4085, pp. 4, 18; 6, 1922, p.92; 3, pp. 147-149.

A crushing plant was built on lot 14 in 1921 by Slate Products Company of Canada, Limited. The plant had a capacity of 75 tons per day, it produced green slate granules.

The most productive slate quarry in the province was on lot 23 operated for many years by the New Rockland Slate Co. The quarry was opened in 1868 and the most productive years seem to have been in the late 1890's when 120 men were employed producing 10,000 to 15,000 squares per year. The slate was used for roofing, billiard table tops, mantels, wash tubs etc.

The good slate band is 200 feet wide, it is flanked on one side by quartzose slates of no utility and on the other by hard fractured slate. The good band has few impurities except for occasional veins of calcite and few crystals of pyrite. The upper 30 feet was stripped in order to reach the usable unweathered slate.

The stone is dark gray, of uniform colour and splits easily giving a smooth surface; pyrite in small crystals is often present in appreciable amounts and the stone darkens after long exposure.

The quarry of New Rockland Slate closed in 1921 and the only recorded production in recent years was for flagstones pulverized products and other miscellaneous uses.

New Rockland Slate Co. opened a new quarry on lot 24 in 1920 to extract some light green slate from a belt running parallel to the new Rockland belt. Very little work was done at this point.

Range V, lot 24

Ref.: 1, no.279, p.236; 2, GM-4085, p.3.

Two miles N.E. of the New Rockland Quarry is the Old Prince Albert quarry which contains slate of the same type and which is probably in the same slate belt. Very little work was done here.

Range VI, lot 22,

Range VII, lot 22

Ref.: 1, no. 279, p.240; 2, GM-4085, p.6.

The Melbourne Slate Quarry opened two quarries on these lots and operated them from 1860 to 1880. Financial difficulties and the enormous quantities of waste that had to be handled were the causes of closure.

ORFORD Township, Sherbrooke county

Range V, lot 2

Ref.: 1, no.279, p.247; 2, GM-4085, p.11.

A slate quarry was opened on this lot around 1861 by Aylmer and Atkinson; no high quality slate was shipped from this location. The slate is gray with a smooth cleave and is durable in colour and wear.

Range VII, lots 4, 5

Ref.: 1, no.279, p.248; 2, GM-4085, p.11.

The slate belt passing through range V of Orford township is found at many places following a southwest line as far as Webster Lake. In range VII, lots 4 or 5, the slate was sampled in the early part of this century and was found to have curved cleavage faces and colour variances on these faces.

ST. JOSEPH Seigniory, Beauce county

St. Joseph parish, lots 422-424, 433

Ref.: 2, GM-4085, p.18; 6, 1921, p.99; 6, 1922, p.93.

After the introduction of roofing paper as a substitute for slate, several quarries were worked to produce granules for this type of material. The mine operated by The British Canadian Marble Co. Ltd. at St. Joseph de Beauce furnished red and green slate during 1921 and 1922. The slate was obtained by underground methods at a depth of 60 feet from a band 10 to 11 feet wide. The crushing and grinding plant had a capacity of 40 tons per shift.

STE. MARIE Seigniory, Beauce county

Ref.: 2, GM-4085, p.12.

The band of red slate which was quarried at St. Hénédine in Joliette Seigniory extends southwestward into Ste. Marie Seigniory.

SHIPTON Township, Richmond county

Range IV, lot 7

Ref.: 1, no.279, p.242; 2, GM-4085, p.7

This quarry was operated in the closing years of the 19th century first for roofing slate then for school slate. Production was important since the opening measures some 400' x 100' and at least 15 feet deep. The colour is not uniform varying from light to dark gray the latter predominating.

There is any amount of slate available in the band near this quarry.

STANBRIDGE Township, Missisquoi county

Range VII, lots 20, 21

Ref.: 2, GM-4085, p.7; 6, 1922, p.93.

A quarry was opened in 1922 on one of these lots by the Mystic Slate Co. The slate is dark blue and was used mainly in the production of roofing granules.

STANDON Township, Dorchester county

Ref.: 2, GM-4085, p.12.

The bands of Ordovician red slates of the Beauceville formation cross Standon township in a N.E. direction.

SUTTON Township, Brome county

Range II, lot 19

Ref.: 3, p.150.

Slate has been noted on this lot.

TRING Township, Beauce county

Range III, lot 18

Ref.: 5, 1888-1889, p.128K

"Fine grained, dark, bluish-gray sandstones" that "divide with the bedding into layers sufficiently thin for roofing slates" occur on this lot and along the Rivière du Loup for some miles above its junction with the Chaudière.

WESTBURY Township, Compton county

On the St. Francis river

Ref.: 5, 1863, p.830; 7, no.560, p.7.

The slates mentioned by Logan in 1863 probably belong to the St. Francis group described by R.Y. Lamarche in 1967 (Ref. 7). They are gray calcareous slates becoming brown on weathering.

TALC, SOAPSTONE, STEATITE AND PYROPHYLLITE

Definitions

The mineral talc is composed theoretically of 4.8% H_2O, 31.7% MgO and 63.5% SiO_2 according to the formula H_2O 3MgO $4SiO_2$. The substance sold under the name of talc often approaches this composition but there are considerable variations due to the presence of such minerals as serpentine, chlorite, amphibole, pyroxene, quartz and carbonates. The oxydes of iron are the most harmful of the impurities since they add to the difficulty of obtaining a white product which is one of the most desirable properties of talc.

Soapstone refers to a talcose rock composed of a mixture of magnesium silicates and usually sold in block form.

Steatite is a pure variety of talc containing very small percentages of lime, alumina and iron oxydes. The early reports of the Geological Survey of Canada used the word steatite for impure soapstone but H.S. Spence* in 1926 applied the term steatite to "massive, compact, cryptocrystalline talc without visible grain and usually of pale yellow or cream colour".

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* H.S. Spence: Talc Steatite and Soapstone, Pyrophyllite, Can. Dept. of Mines, Mines Branch, publ. No. 803, p.9

Like talc, pyrophyllite is a soft mineral with greasy feel and generally difficult to distinguish from talc by colour or texture. Chemically it also ressembles talc with a substitution of alumina for magnesia. The theoretical formula is $H_2O\ Al_2O_3\ 4SiO_2$. While talc is generally associated with magnesium rich rocks such as peridotite, pyrophyllite is derived from acid rocks such as rhyolites, andesites and their metamorphic equivalents. Pyrophyllite is often found in association with sericite which acts as a flux in ceramics. It is therefore important to control the quantity of sericite in this product if the pyrophyllite is to be used as raw material in the ceramic industry.

Uses and specifications

Five industries account for almost three quarters of the consumption of talc in Canada. These are the paint, roofing, ceramic, paper and rubber industries. A smaller percentage is used for the preparation of insecticides, cosmetics, cleaning compounds, pharmaceuticals, linoleum and tile. For these uses, talc is usually ground very fine and the quality of whiteness is most often desired. A small quantity of soapstone is sold in block form to the ceramic industry and an increasing amount is used by the Eskimos in the carving of works of art.

In the paint industry, talc is used as an extender. Specifications call for very fine grinding: 98.5 to 99.9 per cent through 325-mesh screen. Extreme whiteness is desired to prevent the alteration of the tints of pigments. Each paint manufacturer has his own specifications regarding oil absorption of ground talc and this may be influenced by the amount of other minerals present such as tremolite, quartz and carbonates.

The specifications for the roofing industry are much less rigid. Much of the lower grade talc produced in Quebec is used as a dusting agent for asphalt roofing shingles. Extreme whiteness is not of primary importance in the rubber industry nor in the manufacture of insecticides.

The ceramic industry uses talc in powdered as well as in block form. Uniformity of composition and of physical properties are the most desirable qualities. For some uses such as in the manufacture of high frequency insulators a rigid limit is placed on the content of lime, alumina and iron oxydes. When a white product is desired after firing, iron and manganese should be avoided.

In paper manufacturing, talc is used extensively as a filler because of its good retention in the fibre of the paper. High quality papers require talc with high reflectivity to impart sheen and to decrease the absorption of ink. The white colour of paper is conserved in papers coated with talc.

The consumption of talc in the manufacture of cosmetics and pharmaceuticals is of the order of 400 tons per year in Canada. The low demand is compensated by a much higher price for talc of this quality. The main requirements are high reflectivity, fine grinding and the absence of gritty particles.

Prices

There are no rigid quotations in the marketing of talc products, the specifications are so variable that prices are usually

negotiated between buyers and sellers for each sale or contract. The lowest prices are paid for crude soapstone which may sell for as low as $10.00 per ton at the mine. Ground talc sells anywhere from $20.00 to $40.00 per ton depending on size of shipment, preparation for market, colour of product, etc. The high purity talc used in cosmetic and pharmaceutical preparations and the micronized varieties command the highest prices which may reach $100.00 per ton.

Production and consumption

The history of talc production in Quebec dates back to 1886 when a small quantity of soapstone was extracted from deposits in the Eastern Townships and used mainly for foundry and roofing purposes. Development of the industry was very slow and did not reach a value of $100,000. before 1941 when there was a sudden surge of production. The table below gives the quantity and value of production during the years from 1960 to 1970 inclusive.

TABLE I

SOAPSTONE AND TALC PRODUCTION IN QUEBEC 1960-1970

Year	Tons	Value
1960	14,222	$157,611.
1961	16,274	178,911.
1962	15,344	172,489.
1963	15,560	175,013.
1964	17,256	199,049.
1965	14,669	171,525.
1966	15,882	196,945.
1967	17,289	213,188.
1968	- - -	225,000.*
1969	18,852	249,786.*
1970	- - -	312,000.*

* Estimation

The industry has much room to grow since our imports of talc are still greater than our domestic production both in value and quantity. Preliminary figures for 1969 by the Dominion Bureau of Statistics show a production value of $641,213. compared with an import value of $1,697,000.

The table below shows the consumption of talc by uses for the years 1965 to 1968.

TABLE II

CONSUMPTION OF GROUND TALC IN SHORT TONS*

	1965	1966	1967	1968
Ceramic products	11,897	8,412	6,754	4,748
Paint & wall joint sealers	6,678	6,587	6,500	6,990
Roofing	6,157	6,315	6,557	6,823
Paper & paper products	954	2,164	2,968	3,833
Rubber	1,905	1,617	1,264	1,954
Insecticides	809	860	620	636
Toilet preparations	1,294	719	761	709
Clearing compounds	711	685	644	680
Pharmaceutical preparations	471	451	423	365
Linoleum & tile	541	1,967	363	129
Other products	3,254	5,264	5,689	6,134
Total	34,671	35,041	32,543	33,001

Deposits

The talc and soapstone producing areas in Quebec are associated with the ultrabasic intrusives of the Eastern Townships; a great proportion of the original peridotite was transformed into serpentine by the

* Source: Dominion Bureau of Statistics

addition of water. Serpentine and talc have similar chemical formulas except for the presence of more silica in the latter. Cooke* has shown that the formation of talc resulted from the reaction with the enclosing schists which were transformed into chlorite after loosing their silica to the newly formed talc. Asbestos developed instead of talc when their was less solution and when the temperature was lower.

There are many grades of soapstone and talc in the Quebec deposits, some of them are impure and not amenable to a pure white product, others have been treated successfully to yield a product of the highest value.

The list of deposits includes not only the known producers present and past but many areas where soapstone or talc has been observed.

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(3) Quebec Department of Mines, Preliminary Report.

(4) Geological Survey of Canada, Economic Geol. Series.

(5) Department of Mines and Resources, Ottawa, Mineral Dressing and Metallurgical Laboratories, Investigation Report no.

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* H.C. Cooke, G.S.C. Memoir 211 (1937)

(6) War Metals Advisovy Committee 1943

(7) Geology of Canada 1863

(8) Geological Survey of Canada, Report of Progress

(9) Mines and Minerals of the Province of Quebec 1889-90

(10) Canada Dept. of Mines, Mines Branch no.

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(14) Geological Survey of Canada, Memoir no.

(15) Department of Natural Resources, Quebec, office records

(16) Department of Natural Resources, Quebec, unpublished report.

(17) Quebec Bureau of Mines, Annual Report.

(18) Mining Operations in the Province of Quebec.

(19) J.H. Morgan, Talc and Soapstone Deposits, Potton township, C.I.M.M. Transactions, vol. LIX, pp. 120-124, 1956.

LIST OF OCCURRENCES

AUBIN DE L'ISLE Seignory, Beauce county

Parish of St. François (Beauce) near The Famine River

Ref.: 1, no. 803, p.136; 7, p.485.

A pyrophyllite occurrence in a clay slate is described as forming a thin bed. The following analysis is given.

SiO_2 - 50.50	Al_2O_3 - 33.40	MgO - 1.00	K_2O - 8.10
Na_2O - 0.63	H_2O - 5.36	Fe_2O_3 - trace	

AUMOND Township, Gatineau county

Range I, lot 38

Ref.: 2, no.23, p.54.

This deposit was prospected in 1938, a trench 60 feet long and 15 feet deep has uncovered a greyish-white limestone with three narrow veins of talc striking in a N-E direction. The talc is probably an alteration of the dolomitic limestone, it is greyish-white to pale green in colour. Flakes of graphite and mica and grains of diopside and pyrite also occur in the limestone. The deposit is too small to be of economic interest.

BATISCAN Seigniory, Champlain county

Range IV

Ref.: 3, no. 395, p.13.

A talc rock, probably the alteration of a pyroxenite occurs near the north shore of Lac-au-Foin and along the road to Lac Clair, one half mile north of the lake. The extent and purity of the talc are not known.

BOLTON Township, Brome county

Several bands of ultrabasic rocks cross Bolton township in a direction slightly east of north; many talc deposits are known to occur along these bands and some of them have been producers of the mineral.

Range I, lot 23

Ref.: 1, no.803, p.93; 4, no.2, p.100; 5, no.2296; 6 (GM-6733).

This deposit known as the John Pibus property was discovered in 1911 by Leonard Greer who optioned the property to L.N. Benjamin in 1912. Several prospecting trenches were dug until September 1913. The War Metals Advisory Committee sampled the prospect in 1943 and in 1947; beneficiation tests were conducted in the Mineral Dressing and Metallurgical Laboratories in Ottawa.

The talc is light gray in colour and lies on the east contact of a serpentine belt which intrudes crystalline limestones and schists. This contact can be traced for several hundred feet in a northeast direction. The analysis of the sample collected by the War Metals Advisory Committee gave 3.81% ferric iron and 0.28% CaO. It was not found possible to obtain a white product by magnetic separation but flotation tests appeared to give an improved colour and texture over the original feed.

Range II, lot 6

Ref.: 1, no.803, p.93; 4, no.2, p.102; 7, p.797; 8, 1897, p.225S; 9, p.111.

A band of soapstone about 90 feet wide striking N.E. is in contact with serpentine and slate on the southeast side; there is a gradual change to magnesite and dolomite on the northwest side. It would appear that a band of serpentine has been almost completely transformed to talc and dolomite.

This property was further prospected in 1939 by J.E. Ball and L. Roberts of Knowlton. About 30 inches of pale greenish white talc was uncovered near the contact of the soapstone body.

Range II, lot 26

Ref.: 1, no.803, p.93; 4, no.2, p.101; 9, p.111; 10, no.583, p.40; 11, 1911, p.292.

This deposit was known in 1889 at the time of Obalski's report on the Mines and Minerals of Quebec. It was worked by George R. Pibus of Knowlton who opened two small pits and uncovered a band of good quality talc about 7 feet wide. An analysis made at the Bureau of Mines shows a content of 3.66 ferrous oxide and 0.44 of ferric oxide. The crushed material has a creamy shade.

Range IV, lot 4

Ref.: 1, no.803, p.94; 4, no.2, p.102; 7, p.797; 8, 1897, p.225S; 9, p.111.

This talc deposit is described by Logan as being 25 yards wide and associated with magnesite. About 300 yards northeastward it passes into a bed of dark green, slaty serpentine containing asbestos

with chromite and magnetite. Talc occurs at the content with the serpentine on the northwest and is followed by a bed of actinolite mingled with asbestos and talc. No work was done on this deposit.

Range VI, lot 24

Ref.: 1, no.803, p.94; 4, no.2, p.102; 7, p.797; 8, 1871-72, p.148; 9, p.111; 11, 1911, p.292.

This deposit is said to have produced about 300 tons of soapstone in 1871 which were sold for $1,800. by Slack and Whitney. No work was done since that time.

The talc band is associated with phyllite, mica schist, epidote-hornblende schist and chlorite schist. According to Logan a 3 foot band of impure steatite is overlain by 4 feet of dolomite followed by a layer of chlorite a few feet thick then by another band of steatite 5 feet thick; the upper two feet of this latter band contains very pure and compact talc capable of furnishing large blocks of flawless material.

Range VI, lots 25, 26

Ref.: 4, no.2, p.104.

The serpentine ridge which crosses the western part of these lots in a N-E direction is bordered on the west by soapstone, dark green in colour containing chlorite and disseminated magnetite. A pit near the northwest corner of lot 26 is said to have been dug around 1876 by Nathan Banfield. The deposit may be of large extent but the talc is too dark to be used as high grade material.

Range VII, lot 2 East

Ref.: 1, no.803, p.95; 3, no.344, p.8 (F); 6 (GM-6732); 12, 1935, p.35; 12, 1936, p.43.

A deposit of grayish talc was explored in 1935 and 1936 on this lot by the Broughton Soapstone Quarry Company. A small mining plant was installed and a shaft sunk to a depth of 40 feet. A few tons of talc were shipped at that time for experimented purposes. An analysis of the crude talc from the stockpile gave 3.95% ferrous oxide and 1.20% ferric oxide. One band of talc 3 feet wide is pale green and gives a white powder. Quartz-sericite and chlorite schists and slates of the Bonsecours formation are the main country rocks in the vicinity.

Range IX, lot 1

Ref.: 1, no.803, p.95; 4, no.2, p.105; 13,1894, p.62J.

A band of soapstone 40 feet wide is reported in a railway cutting on this lot. It is associated with serpentine and dioritic rocks.

Range IX, lot 17

Ref.: 1, no.803, p.95; 4, no.2, p.104; 7, 1863, pp. 797-798; 13, 1891, p.152K.

A talc zone, 20 feet wide occurs near the northeast shore of lake Nick, on the margin of a steep scarp of serpentine. The talc is dark in colour and is associated with magnesite and disseminated grains of pyrite. The material is not of good quality and could only be used where high quality white talc is not required.

BOUSQUET Township, Rouyn-Noranda county

Fault zone passing north of Norman Lake

Ref.: 3, no.227, p.32.

The Cadillac - Lake Bouzan fault zone striking east and west, crosses the northeast bay of Norman Lake in the N.E. quarter of Bousquet township. This fault zone has a maximum width of 300 feet and consists mainly of talc and chlorite schist. This talc deposit has never been considered as a potential source of the mineral for the industry.

BROME Township, Brome county

Ref.: 1, no.803, p.96; 4, no.2, p.98.

Impure soapstone occurs in association with ultrabasic rock notably in range VIII, lot 2, range IX at Knowlton and in range XI, lot 6 S½. The last named location was prospected in 1939 by J.E. Ball who uncovered a talc zone about 25 feet wide. The talc is gray and fissile.

BROUGHTON Township, Beauce and Megantic counties

Ref.: 14, no.211, pp. 149-153.

The Pennington dyke consisting of peridotite with derived serpentine contains many asbestos occurrences and is often bordered by soapstone and talc deposits. This dyke crosses Broughton township in a N.E. direction. Two other parallel peridotite dykes strike at right angles to the Pennington dyke running northwest through ranges X and XI of Broughton. Talc and soapstone have been mined from these deposits since 1923.

Range IV, lot 12

Ref.: 9, p.112.

This deposit of "Potstone" is mentioned by Obalski in his report of 1889. At that time the soapstone mining industry was in its infancy there being only one deposit being mined in Wolfe county.

Range VII, lot 13a

Ref.: 15, Fev. 1941; 9, p.111.

This occurrence is also mentioned by Obalski. In 1941 Dr J.E. Fortin and T. Labbé did some prospection on the deposit but no production was recorded.

Range VII, lot 14

Ref.: 1, no.803, p.83; 4, no.2, pp. 112, 113; 13, 1891, p.153K; 14, no. 211, p.149;

This is the old Fraser mine which was worked for asbestos at the turn of the century and again from 1917 to 1920. The soapstone occurs as a narrow band along a serpentine contact. The talc is said to be of good quality but the deposit is too small to be mined by itself; it could possibly be an excellent by-product if the asbestos exploitation was reopened.

Range VIII, lot 13

Ref.: 15, GM-7344, 1919.

This is an asbestos prospect which was worked around 1919 by J.A. Jutras who sold his rights in 1920 to Hugh Lee. The property changed bands several times until it was bought in 1947 by Broughton Soapstone and Quarry from Edouard Lacroix.

The talc occurs at the contact of serpentine, the deposit is small but the mineral crushes to a fine white powder. There is no record of production from this lot.

Range IX, lot 11

Ref.: 12, 1934, p.54; 12, 1935, p.35.

L.C. Pharo worked a deposit on this lot from 1933 to 1935 with a group of 7 to 10 men. A small plant was built to cut furnace blocks, for the pulp mill trade. The soapstone occurs at the contact of serpentine which is part of the Pennington dyke.

Range X, lot 8a

Ref.: 12, 1937, p.45; 12, 1938, p.45; 12, 1943, p.61.

Broughton Soapstone and Quarry Co. Ltd. acquired this lot from Jos. Morin in 1938. It had started prospecting the deposit in 1937 and continued development work in 1938. There is no record of production from this lot. The soapstone lies along the serpentine dyke which runs at right angles to the Pennington dyke in range X of Broughton.

Range X, lot 12

Ref.: 1, no.803, p.84; 12, 1925-1967.

The soapstone quarry located near the boundary of ranges X and XI, on lot 12, has been one of the most productive in the province of Quebec. The first developments took place in 1923 when Louis Cyr

opened a quarry in range X. That same year, the Robertson Soapstone and Quarry Company Ltd. was formed by Mr. Cyr to work the deposit in Broughton township and other deposits in nearby Thetford and Leeds townships. In 1926, the Broughton Soapstone and Quarry Co. Ltd. acquired the properties of Robertson Soapstone but the direction of the company remained under Mr. Cyr.

The output from this quarry has been used mainly for lining alkali furnaces in pulp mills using the sulphate process. Blocks of soapstone are being used increasingly for carving objects of art. They are cut into pencil form to be used in steel foundries. The powder is used as a filler in many products notably in rubber and in the manufacture of insecticides.

The talc and soapstone deposits in Broughton township are associated with the Pennington dyke of peridotite which has also yielded important quantities of asbestos. The soapstone is greyish green and contains almost 6% of ferrous iron in some analyses. The band strikes north - west and has a low dip; the quarry walls are about 250 feet apart indicating the approximate width of the soapstone band at this locality.

Range XI, lots 2, 4

Ref.: 4, no.2, p.112; 10, no.583, p.41; 11, 1909, p.198; 13, 1891, p.153K

J.A. Dresser and R.W. Ells reported the occurrence of talc on these lots presumably associated with the serpentine dykes that run in a N.W. direction near the boundary line of ranges X and XI. A visit to the locality by H.S. Spence in 1921 and by M.E. Wilson in 1925, failed to reveal any talc deposit on these lots.

Range XI, lot 11

Ref.: 12, 1933, p.53; 12, 1934, p.57 (F).

L.C. Pharo opened a quarry on this lot in 1933 and erected a block sawing plant. The operations lasted for a little more than one year with an average of 6 men after which the equipment was moved to another location in Thetford township.

Range XI, lot 12

Ref.: 1, no.803, p.84; 12, 1925-1967.

This deposit is the same as that discussed in range X, lot 12. The quarry straddles the range boundary on lot 12.

CARPENTIER Township, Abitibi-East county

Ranges IV, V, lots 28-33

Ref.: 3, 205, pp. 37-39; 16 (by Claude René, 1964); 17, 1933, pt.B, pp. 62-63.

A band of quartz-pyrophyllite-chlorite schist was found in this township covering an area 4,500 feet long and 400 feet wide. These schists are probably derived from the alteration of acid tuffs and agglomerates.

By X-ray diffraction, followed by microscopic examination, it was found that pyrophyllite was the most abundant mineral in this zone followed by quartz, chloritoid and andalusite.

The area in general and the schists in particular were actively prospected for gold since 1933. In 1945, Bonsecours Mines Ltd. intersected porphyries with quartz filled fractures in two short drill holes in the north half of lot 31, range IV; assays of 0.24 ounce/ton over 5 feet and 0.31 ounce/ton over 8.6 feet were obtained. The area was again prospected in 1962 by the Canadian Johns-Manville Company who conducted magnetic and electromagnetic surveys. In 1964, Marimac Mines Ltd. drilled 15 holes on lots 31, ranges IV and V. Finally in 1965-66, Domtar Chemicals Ltd. drilled 16 holes to explore the pyrophyllite.

Pyrophyllite and quartz are by far the most abundant mineral in the schist zone representing on average two and one third of the rock respectively. The main impurities are chloritoid which may constitute an important part of the rock in some places, diaspore, corundum, andalusite, kyanite, pyrite, feldspar, rutile, staurolite, garnet and dolomite.

It is conceivable that gold could be recovered as a by-product of pyrophyllite mining, the pyrite rich zone in particular are interesting because some analyses show that the gold is associated very closely with this mineral.

DUBUISSON Township, Abitibi-East county

In Lake De Montigny

Ref.: 5, no.641; 17, 1935 B, p.34; 2, no.17, p.10-11.

Ultrabasic rocks now altered to serpentine and often to talc and soapstone are found on many exposures in Dubuisson township but mainly on some islands in Lake De Montigny. They were also intersected in holes drilled from the ice on the property of Sullivan Consolidated Mines Ltd. Further north, on the property of SiscoeGold Mines the same ultrabasic formations largely altered to talc-chlorite schists are encountered. Some of the gold mineralization at Siscoe is found within these schists.

No attempt was ever made to utilize these talcose rocks and it is doubtful that it would be a paying proposition to prepare them for market.

FREVILLE Township, Pontiac county

Ref.: 15, GM-22662, 1965.

During an exploration programme for base metals in 1965, a talc deposit was found on the property of Hitland Clay Products Inc. Diamond drilling and trenching has proved a true width of 103 feet. The analysis of the product was as follows: SiO_2 40.27%, FeO 5.96%, Fe_2O_3 2.74%, Al_2O_3 4.08%, CaO 1.72%, MgO 30.25%.

GARTHBY Township, Wolfe county

Ref.: 9, p.112; 11, 1897, p.225S.

Soapstone beds have been noted at this point.

GRENVILLE Township, Argenteuil county

Range II, lot 16

Ref.: 1, no.583, p.39; 1, no.803, p.82.

A talc rock which is probably an alteration of pyroxenite is found near the foot of the falls on Calumet Creek. This rock was quarried as dimension stone near the turn of the century.

Range II, lots 26, 27

Ref.: 1, no.583, p.39; 1, no.803, p.81; 3, no.2, p.95; 7, p.470; 13, 1899, p.37J; 17, 1936 pt.C, p.36.

Soapstone occurs on these lots associated with crystalline dolomite. The rock was quarried in a small way before the report by Logan in 1863. A sample collected by Spence in 1920 gave the following analysis.

SiO_2 - 58.96	FeO - 1.01	Fe_2O_3 - 0.58
Al_2O_3 - 1.03	CaO - 1.16	MgO - 30.96
CO_2 - 0.85	H_2O above 105°C - 5.48	

HAM SOUTH Township, Wolfe county

Range I, lots 22 and 25

Ref.: 1, no.583, p.41; 4, no.2, pp. 105-106; 9, p.112; 14, no.211, p.150.

Soapstone occurs near the margin of the serpentine belt near the east shore of Nicolet Lake.

Range V, lot 4

Ref.: GM-10707, 1938.

In 1938, Mr. Israel Beauchesne dug two trenches at 75 feet interval and found a zone of talc some 45 to 60 feet wide striking about N.S. The deposit lies at the contact of serpentinized pyroxenite and argilaceous schist. The talc is generally light green, there are a few grains of chromite but no pyrite associated. A sample submitted for analysis gave the following results.

SiO_2 - 60.18	CaO - 0.00	FeO - 3.22	MgO - 29.11
Fe_2O_3 - 0.42	CO_2 - 0.00	Al_2O_3 - 1.35	H_2O - 5.56

HATLEY Township, Stanstead county

Range V, lots 19-21

Ref.: 4, no.2, p.105; 13, 1887, p. 67J.

According to R.W. Ells, a deposit of talc of considerable extent and of excellent quality occurs on these lots.

INVERNESS Township, Mégantic county

Range I, lot 1

Ref.: 1, no.583, p.42; 1, no.803, p.91; 4, no.2, p.108.

Several small pits were dug on this property in the early years of this century. A zone of soapstone 80' wide striking N.E. and diping 30°W was uncovered in altered schists. The hanging wall is made of a band of light green talc, low in iron which appears to be of fine quality, this band varies in width from 2 to 6 feet and was opened over a distance of 100 feet. A second zone of talc possibly exists on the footwall.

IRELAND Township, Megantic county

Range VII, lot 1

Ref.: 12, 1933, p.53.

Some prospecting was carried out for talc on this lot in 1933. Numerous small veins, up to 15 inches wide were uncovered but none of workable size.

Range VII, lot 2

Ref.: 1, no.583, p.42; 1, no.803, p.92; 4, no.2, pp. 106, 107; 14, no.211, p.150; 18, 1906, p.44.

This deposit was developped around 1906 by The Megantic Talc Company. A pit 30 feet long, 20 feet wide and up to 15 feet deep was excavated in a serpentine band. Irregular veins of pale green, translucent talc associated with ankerite are seen in this pit, their maximum width is about one foot. The following analysis is given by H.S. Spence of the pale green talc.

SiO_2 - 60.86	FeO - 1.11	Fe_2O_3 - 0.24	Al_2O_3 - 0.22
CaO - 0.08	MgO - 32.19	CO_2 - 0.09	H_2O above 105°C - 4.50

LAPOTARDIERE Township, Gaspé North township

West of Mount Albert on Ste. Anne River

Ref.: 4, no.2, p.114; 8, 1882-1884, p.20F.

Veins of light green talc in an olivine bearing rock were noted by R.W. Ells in 1882.

LAUZON Seigniory, Levis county

St. Nicholas Parish

Ref.: 1, no.803, p.136; 7, p.485.

Thin layers of pyrophyllite in shales and sandstones near an intrusive trap rock. Two analyses are given.

SiO_2	Fe_2O_3	Al_2O_3	CaO	MgO	K_2O	Na_2O	H_2O
48.42	4.50	27.60	2.80	1.80	5.02	2.78	6.88
48.50	5.67	27.50	1.30	2.24	5.30	1.91	7.40

LEEDS Township, Mégantic county

Range IV, lots 12 A

Ref.: 12, 1938-1947

A soapstone band, some 40 feet wide was quarried by L.C. Pharo from 1938 to 1947; up to 15 men were employed in the quarry and pulverizing mill, producing soapstone blocks and crayons mainly for exportation to the United States and England. The smaller cuttings were pulverized or sold to pulverizing mills. Some parts of the deposit contain much quartz, making it more difficult to saw the product into blocks.

Range XV, lot 15

Ref.: 12, 1937 and following years; 18, 1925, p.81.

The quarry on lot15, range XV, was opened in 1925 by the Robertson Soapstone and Quarry Co. Ltd. which was to become the Broughton Soapstone and Quarry Co. Ltd. the following year.

This talc deposit lies along a dyke of serpentinized peridotite which runs northwestward through the townships of Broughton and Leeds. The quarry has been in operation intermittently since 1925 producing refractory bricks, steel men crayons, and powder for insecticides.

MELBOURNE Township, Richmond county

Range IV, lot 23

Ref.: 1, no.583, p.44; 1, no.803, p.99; 4, no.2, p.105.

The Canada Paper Company of Windsor Mills extracted some 200 tons of soapstone from this quarry in 1918 and 1920, the material was used for furnace lining in the kraft pulp plant. The occurrence consists of a narrow band about one foot wide in an altered igneous rock. Following is an analysis of a sample from this deposit.

SiO_2	FeO	Fe_2O_3	Al_2O_3	CaO	MgO	CO_2	H_2O above 105°C
61.12	3.16	0.20	0.54	nil	30.48	nil	4.58

Range V, lot 21 (NE ½)

Ref.: 6, GM-6731

A talc vein 2 to 4 feet wide and striking N-E is said to have yielded good quality talc in block form at this locality.

POTTON Township, Brome county

Range II, lots 5, 6

Ref.: 1, no.803, p.96; 12, 1938 to 1947.

This talc mine is situated 1½ miles west of Highwater, it was opened in 1938 by the Baker Mining and Milling Company which was to become the Baker Talc Company Limited in 1952.

The deposit lies on the north side of a hill and was worked almost continuously from 1938 to 1948 yielding a total of about 25,000 tons of talc. A composite sample of the cleanest ground material was analysed in the laboratories of the Bureau of Mines in Ottawa giving the following results.

SiO_2	FeO	Fe_2O_3	Al_2O_3	CaO	MgO	CO_2	H_2O above 105°C
51.52	4.37	0.38	1.96	1.12	29.63	5.77	5.32

Range IV, lots 17 and 18

Range V, lots 18 and 19

Ref.: 1, no.583, p.41; 1, no.803, p.98; 4, no.2, p.98; 7, p.470.

The talc deposit on these lots is known at least since 1863 when it was reported by Logan in the Geology of Canada. In 1920, it was explored principally on lot 19, range V by the Talc Development Company of Canada Ltd. who reported the discovery of a large body of talc. The Baker Mining and Milling Company made an attempt to mine this deposit from 1949 to 1952, about 3,000 tons of talc were produced but the mineral was found to be too hard and of inferior quality to that of their other mine on range II. The talc occurs at the west contact of a serpentine band, some 200 feet wide striking in a N-S direction.

Range V, lot 28

Ref.: 1, no.583, p.41; 1, no.803, p.98; 4, no.2, p.100; 19.

This deposit has been mined continuously since 1952 by the Baker Talc Company, it is known as the Van Reet Mine; hardly anyexploration had been done here at the time of the mine opening. Two small pits had been excavated and were probably known at the time of the publication of the Geology of Canada in 1863.

Serpentine dykes intrude the Sutton schists in this area, they strike about N20°E and are altered to soapstone and talc principally near their walls but sometimes over their whole width. A generalized cross section of these dykes is given by Morgan (19): the centre of serpentine is flanked by massive talc and magnesite succeeded by zones of schistose talc and soapstone. The wall rock is chlorite-sericite-quartz schist.

The company is now equipped to produce talc of very high quality for paint, cosmetics, pharmaceuticals and paper.

Range VI, lots 24, 26

Ref.: 9, p.111; 13, 1897, p.225S.

These two locations are mentioned as having occurrences of talc and soapstone.

PREISSAC Township, Abitibi-East county

S.W. Quarter

Ref.: 14, no.166, p.141; 15, GM-25,703, 1969.

Talc is an abundant mineral associated with the molybdenite deposits of Preissac township. Near the old St. Maurice Mine, a peridotite body is almost completely serpentinized and contains much talc. During mining operations at Anglo American Molybdenite Corp., some tests were made inethe pilot plant of the Quebec Department of Natural Resources to separate the molybdenite from the talc. No evaluation of the talc as such has ever been made.

RIGAUD-VAUDREUIL Seigniory, Beauce county

St. Victor River

Ref.: 1, no.583, p.40; 1, no.803, p.86; 4, no.2, p.113; 14, no.127, p.87.

A deposit of soapstone occurs on the north side of the St. Victor River about $2\frac{3}{4}$ miles west of the Chaudière. The band is about 30 feet wide at the contact of slaty conglomerate and dunite and the soapstone is an alteration product of the latter. The rock is highly fractured and jointed which makes it difficult to cut into blocks.

ROY Township, Abitibi-East county

Property of Lake Chibougamau Mines Ltd.

Ref.: 15, GM-3738-B.

A complex of quartz-steatite with tremolite and actinolite was intersected during a programme of diamond drilling on this property in 1956.

STANSTEAD Township, Stanstead county

Range I, lot 15

Ref.: 1, no.803, p.136; 7, p.485.

A belt 150 feet wide of pyrophyllite is said to occur at this location, enclosed in chloritic slates. The following analysis of the material is given.

SiO_2	Al_2O_3	MgO	H_2O	Fe_2O_3
50.30	32.60	1.20	6.50	trace

Range IX, lot 13

Ref.: 1, no.583, p.45; 4, no.2, p.105; 7, p.767.

A soft talcose slate with greyish-white and yellow layers dipping vertically. The rock was employed as a filler in paint.

SUTTON Township, Brome county

Range V, lot 10

Ref.: 4, no.2, p.97.

Talc schist, massive talc and magnesite are found in zones over a width of about 20 feet. The talc is light in colour but scattered grains of grey magnesite, millerite and chromite would prevent its use as a high grade material.

Range VII, lots 10, 12

Range VIII, lot 11

Ref.: 4, no.2, p.98; 7, p.797; 9, p.111.

These locations have been mentioned as containing soapstone and talc in early reports but no work was ever done on the deposits.

THETFORD Township, Megantic county

Range II, lot 12

Ref.: 1, no.803, p.88.

About 18 cars of cut furnace brick are said to have been shipped from a quarry on this lot in 1924 by the Robertsonville Soapstone Quarry Co. The deposit is within a band of soapstone that extends northward across ranges II, III and IV along the valley from Pontbriand.

Range III, lots 11, 12, 13

Range IV, lots 10, 12

Ref.: 1, no.803, p.88; 12, 1934, 1936, 1937, 1944; 18, 1923.

One quarry on lot 12, range III was opened in 1923 by the Robertsonville Soapstone Quarry Co. managed by L.R. Cyr. The main product was in the form of bricks used for lining furnaces. Joseph Houle opened another quarry on lot 12 in 1925 and worked the soapstone on lot 13, range III and lot 12, range IV; these operations were taken over in 1934 by L.C. Pharo of Thetford Mines who produced pulverized talc as well as blocks, bricks and crayons.

The quarry on lot 11, range III was opened in 1937 by L.C. Pharo but it was short lived; another attempt to mine soapstone was made in 1940 by Paul Toussaint and Wilfrid Labonté on lot 10, range IV.

The main activity was on lot 13, range III, where a quarry was operated until 1948 by the Broughton Soapstone and Quarry Company.

Range V, lots 2-8, 9

Ref.: 1, no.803, pp. 89-91; 12, 1933-1944.

The main operator in range V, was Charles Fortin who worked in partnership with A. Bisson. Their quarry was on lot 2 and was quite active from the year 1933 to 1948. The stone in this quarry is fissile and grey and was used mainly in making bricks.

The quarry on lot 3 had a short life and was operated in 1945 by the Broughton Soapstone and Quarry Company.

L.R. Cyr who pioneered in the mining of soapstone and talc first opened a quarry on lot 5 in 1923 and worked other openings on lots 4 and 6, these occurrences had been worked as a source of foundry talc many years before.

On lot 7, T. Demers of Thetford Mines shipped about 100 tons of crude soapstone to a rubber firm in the U.S.A. in 1920, and on lot 9, two cars of cut stone were produced in 1924.

VASSAN Township, Abitibi-East county

Ranges III, IV, lots 39-45

Ref.: 2,no.17, pp. 10-11; 14, no.166, p.139.

Near the Siscoe Mine serpentinized and talcified rocks strike in a direction slightly south of east through these lots; they have never been considered as a source of commercial talc.

WEIR Township, Bonaventure county

Range II, lot 37

Ref.: 15, GM-21888

This talc occurrence was prospected in 1906 by the McLaurin Brothers; a pit 40 feet long and 15 feet wide was put down near the east limit of serpentine exposures. Preliminary examination of the pit material did not reveal any talc of sufficient quantity or quality to warrant a mining venture.

WOLFESTOWN Township, Wolfe county

Range I, lot 20

Range II, lot 20

Ref.: 1, no.583, pp. 44-45; no. 803, pp. 99-100; 4, no.2, p.106;
9, pp. 111, 112.

No work has been done on this deposit of talc since 1912 when J. Martel took out a small tonnage. It had previously been mined by the Wolfestown Mining Co. from 1888 to 1897 producing about 3,000 tons of soapstone which was used as a powder in paint and lubricants. The exposure consists of talc and chlorite schists, the talc band being one to 10 feet in width. The workings are mainly on lot 20, range II, but exposures of talc are also reported on lot 20, range I.