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FLAVRIAN LAKE AREA, BEAUCHASTEL AND DUPRAT TOWNSHIPS, TEMISCAMINGUE AND ABITIBI TERRITORY

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GEOLOGICAL REPORT 13

FLAVRIAN LAKE AREA

BEAUCHASTEL AND DUPRAT TOWNSHIPS, TEMISCAMINGUE AND ABITIBI COUNTIES.

by

W. G. Robinson

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1943

FLAVRIAN LAKE MAP-AREA

BEAUCHASTEL AND DUPRAT TOWNSHIPS

TEMISCAMINGUE AND ABITIBI COUNTIES

by W.G. Robinson

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MAP

FLAVRIAN LAKE MAP-AREA

BEAUCHASTEL AND DUPRAT TOWNSHIPS

TEMISCAMINGUE AND ABITIBI COUNTIES

by W.G. Robinson

INTRODUCTION

General Statement

During the summer of 1939 the writer mapped the geology of the following parts of Duprat and Beauchastel townships: lots 10 to 31, ranges I and II, Duprat township; lots 10 to 31, range X, and lots 23 to 28 and the northern parts of lots 10 to 31, range IX, Beauchastel township. As gold had been found at several places within the area, it was deemed advisable to map with a plane table on the scale of one inch to 400 feet.

Lots 23 to 31, range IX, Beauchastel township, at the southern margin of the map, are north of and contiguous to the Halliwell area, which was mapped in 1938 by G.S. MacKenzie for the Quebec Bureau of Mines (1). In lots 29 to 31, the map accompanying the present report overlaps Map No.492 (Halliwell area) and the geology has been copied directly from the latter without revision by the writer.

The area is easily reached by motor road from Noranda. A branch from the Noranda-Kirkland Lake highway turns north at the village of Evain, about seven miles west of Rouyn, and joins a passable gravel road which extends west along the line between ranges IX and X of Beauchastel township to the southeast corner of the map-area. Here, an uncompleted road turns northward to the camps of Saint Jude Gold Mines, on lot 26, range II, Duprat township. A rough waggon trail branches from this road and leads to the Flavrian and Rainville camps, respectively in lots 24 and 14, range I, Duprat. Footpaths and range lines provide easy access to all parts of the map-area.

Most of the area has been burned over by forest fires in recent years and as a consequence exposures of bedrock are extensive and numerous. The second growth timber is small and only a few stands of first growth remain. No part of the area has been settled. A few hundred acres near the camps of Flavrian Gold Mines are flat, well covered with soil, and suitable for agriculture, but most of the area is rough, rocky, and useless for cultivation. The topography is relatively rugged but the relief is commonly less than three hundred feet. The area includes the northwest part of Flavrian lake and two small lakes, Audisier and Twin lake. Crossing it are several streams, all of them small.

Acknowledgments

Splendid co-operation was received from the managements of the mining properties within the map-area. Mr. D.J. Hirst of Flavrian Gold Mines, Mr. Edmund Bregend of Saint Jude Gold Mines, Dr. B.S.W. Buffam of the Waite-Buffam claims, and Mr. John DeMille,

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(1) MacKenzie, G.S., The Halliwell Mine Map-Area; Que. Bur. Mines, Geol. Rept. No.7, 1941.

consultant for Golconda Mines and the White Quartz Gold Mines, all places their records at the disposal of the writer. The management of Flavrian Gold Mines kindly allowed the party the use of their camp buildings for the summer's work.

The writer was assited in the field by W. Ingham and F. Massicotte, students of Toronto and Laval Universities, respectively. P.E. Levesque acted as cook for the party. All performed their duties in a capable manner.

Helpful co-operation was received from members of the staff of the Department of Geological Sciences at McGill University, where this report was written.

Previous Work

The following reports, maps, and papers contain information directly concerned with the Flavrian Lake map-area:

WILSON, M.E., Larder Lake and Eastward; Geol. Surv. Can., Summ. Rept., 1909,

WILSON, M.E., Kewagama Lake Map-Area; Geol. Surv. Can., Memoir 39, 1913.

WILSON, M.E., Timiskaming County; Geol. Surv. Can., Memoir 103, 1918.

JAMES, W.F., Duparquet Map-Area; Geol. Surv. Can., Summ. Rept., Part D, 1922.

COOKE, H.C., Origin of the Copper Ores of the Rouyn District; Geol. Surv. Can., Summ. Rept., Part C, 1926.

COOKE, H.C., JAMES, W.F., and MAWDSLEY, J.B., The Geology and Ore Deposits of the Rouyn-Harricanaw Region, Quebec; Geol. Surv. Can., Memoir 166, 1931.

Duparquet Map-Sheet; Geol. Surv. Can., Map 281A, 1933.

Rouyn-Bell River Area; Geol. Surv. Can., Map 238A, 1936.

GUSSOW, W.G., Petrogeny of the Major Acid Intrusives of the Rouyn-Bell River Area of Northwestern Quebec; Trans. Roy. Soc. Canada, Vol.XXXI, Section IV, 1937, pp.129-161.

The publications listed below contain information pertinent to the district near the map area:

COOKE, H.C., Opasatika Map-Area; Geol. Surv. Can., Summ. Rept., Part D, 1922.

BRUCE, E.L., Aldermac-Arntfield Mines Map-Area, Beauchastel Township; Que. Bur. Mines, Ann. Rept., Part C, 1932.

MACKENZIE, G.S., Fortune Lake and Wasa Lake Map-Areas; Que. Bur. Mines, Geol. Rept. No.5, 1940.

MACKENZIE, G.S., The Halliwell Mine Map-Area; Que. Bur. Mines, Geol. Rept. No.7, 1941.

Geol. Surv. Can., Maps 453A, 454A, 455A, 456A, 457A, of the Rouyn, Amulet, Waite, Newbec, and Dufault Areas, respectively, 1939.

GENERAL GEOLOGY

General Statement

The consolidated rocks of the area are all of Precambrian age, and most of them resemble those described from this district by MacKenzie (1) and earlier workers.

Keewatin-type volcanics underlie most of the western, central, and northern parts of the area. They include basic lavas, light-green volcanic flows and pyroclastics, a complex of rhyolite rocks, and bedded tuffs. Intruding these rocks are masses or dykes of quartz diorite, 'intrusive rhyolite', granite, quartz porphyry, feldspar-quartz porphyry, and mica lamprophyre.

The data obtained on the major structure of the area are fragmentary. In the western part, the flows strike east, dip steeply south, and face south. Eastward, the trend of the structure changes so that the strike becomes closer to north, and the flows dip steeply east and southeast with tops facing the same direction.

Gold has been found in a few places near the margin of the Flavrian granite mass, both in the granite and in the adjoining rocks, but development work to date has not disclosed bodies of ore which can be commercially exploited. Narrow veinlets of chalcopyrite are exposed on the Saint Jude claims, and molybdenite was seen in quartz veins at several points in the southwest part of the area.

Table of Formations

Pleistocene and Recent	Boulder clay, sand and gravel, stratified clay
	Great unconformity
Precambrian	Quartz diorite Syenite porphyry Twin Lake feldspar-quartz porphyry
	Intrusive contact
	Aplite Quartz porphyry Saint-Jude igneous breccia Flavrian (albite) granite
	Intrusive contact
	Mica lamprophyre
	Intrusive contact
	Quartz diorite and related intrusive rocks
	Intrusive contact
	Keewatin-type flows and tuffs

Keewatin-Type Volcanics

Basic Lavas:

The western and northern parts of the map-area are underlain mainly by meta-volcanic rocks, or 'greenstones', of Keewatin type. A thin pendant of these stretches across the northern end of the Flavrian granite mass and patches of them are found in the 'rhyolite complex' of the central part of the area. Metamorphism has masked the original composition of many of the flows, but judging from field appearance they appear to range from rhyolite to andesite and possibly basalt. A few outcrops of bedded pyroclastics were seen, but neither these, nor any particular flow, could be traced for any distance or used as a marker horizon.

The basic flows are chloritic, weather dark green or grey, and are only locally schistose. They are characterized by pillows and epidotized patches. The pillows are well-formed and show no

signs of deformation; thus they afford a means of determining the attitude of the flows. Patches of epidote occur both in the massive flows and in those with pillow structure. They are either round or elongated and are from a few inches to several feet in diameter. They are common in the centres of the pillows, but in places can be seen cutting across their margins. In any one locality, the elongated patches of epidote have a uniform orientation. Another type of alteration in the basic lavas gives rise to the formation of small aggregates of acidic minerals, which give the rock a spotted appearance. In the pillow lavas, this alteration commonly follows the contour of the pillows. In some places, concentric rings of such alteration parallel the pillow outlines, resulting in a lace-like pattern of small white spots. The altered basic lavas in some localities are difficult to distinguish from diorite.

Light Green Lavas or Pyroclastics:

The volcanics in the southwest part of the area weather light green or grey and are more acidic and more schistose than the flows to the north of them which have been described in the foregoing paragraphs. Pillows are rare. Bands of breccia which are interbedded with the flows contain rounded and elongated fragments which are commonly more acidic than the surrounding material. Most of these bands are probably flow breccias, but some of them may well be explosion breccias; the schistose and altered character of the rock make it difficult to distinguish between the two types. The light-green volcanics vary considerably in their acidity and appearance. Irregular patches and bands of them extend into the rhyolite complex discussed below, and in many places no clear-cut distinction between the two can be made. The scarcity of pillows in these rocks suggests that originally they were quite different in composition from the basic flows to the north. They may represent a horizon of partially replaced pyroclastics, the permeable character of which would render them more susceptible to alteration than are the basic flows.

Bedded Tuffs.-In three places, bands of bedded tuff were seen in association with the light green lavas, but the outcrops are small and the bands could not be traced far. They dip steeply, as do the flows to the north of them.

Rhyolite Complex:

Most of the central part of the area is underlain by fine grained siliceous rocks of uncertain origin. These outcrop in an area which is about a mile and a half wide at the southern boundary of the map-sheet and narrows northward to an apex near the line between ranges I and II of Duprat township.

Most of the rocks of the complex are light grey, but some are light green or pink. They all weather white or grey, with a smooth surface, and show the angular fracturing common in brittle, acidic rocks. Schistosity is rare, but some of the outcrops are cut by closely spaced fractures. In places, small crystals of feldspar, and small, dark 'eyes' of quartz, can be seen in hand specimens. Fine, wavy lines, apparently flow lines, are seen on the weathered surface of some of the outcrops, and amygdules were observed in places. In two outcrops, outlines of pillows could be discerned.

In appearance, these rocks closely resemble the rocks mapped elsewhere in the district as rhyolite extrusives, and it is possible that in some part they may represent flows. However, in places in the map-area, rhyolite-like rocks are seen to intrude the surrounding rock-types and to hold inclusions of the older rocks. Elsewhere, 'rhyolites' appear to grade into the surrounding rocks, which would suggest an origin by metasomatic replacement of older rocks. It was suggested above that some of the light green volcanics in the southwest part of the map-area may be pyroclastics, the permeable nature of which made them susceptible to alteration and partial replacement. Similarly, some of the more siliceous rocks of the rhyolite complex may be the result of complete metasomatism of pyroclastics.

In the preceding paragraph, three possible modes of origin for these fine-grained siliceous rocks have been indicated. Over much of their outcrop area, however, alteration has masked their original character, and in the field it was found difficult or impossible to decide between these alternatives. As a consequence, all of these rocks have been mapped as a unit under the common designation 'rhyolite'. The rhyolites have been altered in varying degree and, where alteration has been severe, the weathered surface is very rough with harder material standing out as angular studs, giving the rock the appearance of a breccia.

On lots 20, 21, and 22 of range I, Duprat township, two distinct types of rhyolite were seen. A dark-grey type, the weathered surface of which shows well defined lines comparable to flow lines, is intruded by irregular bodies of light-grey massive 'intrusive rhyolite', which is commonly amygdaloidal near its contact with the older type. Small crystals of feldspar and small 'eyes' of quartz can be discerned in the intrusive type.

Near its northern end, the rhyolite mass includes numerous patches of andesite. Most of these are much altered, but in many of them pillow markings can be seen. In lots 17 and 18 of range I, the rhyolite intrudes quartz diorite, and west of this, in lots 15, 16, and 17, it is seen to intrude andesite.

In the southwest part of the map-area, the rhyolite occurs as small bodies associated with the light green volcanics. In some places it can be seen to intrude the latter; in others it appears to be an extrusive flow rock. Most of the rhyolite in this section of the map-area is light pink and contains small, dark 'eyes' of quartz.

In the central-southern part of the area, the rhyolites are dark grey, and almost everywhere they contain large and small inclusions of light-green volcanics which have been altered and possibly have been partially assimilated. Most of the rhyolite-andesite contacts seen are gradational. In lot 20 of range X, Beauchastel township, two outcrops of rhyolitic rock were seen that have well-defined pillow structure, suggesting that they are silicified basic lavas.

Quartz Diorite and Related Intrusive Rocks

A number of intrusive bodies of diverse sizes and shapes, approximating quartz diorite in composition, are found throughout the map-area. Most of these rocks are massive and have a uniform granularity. Hornblende, feldspar, and in some places quartz, are

visible in hand specimens. On a fresh surface, the rock has a speckled, dark grey aspect and it weathers dark green.

Field relationships indicate that dioritic rocks of at least two ages occur in the area. Some are seen to intrude, and some are intruded by, the granite. Similarly, diorite dykes intrude the rhyolite complex, and in places bodies of diorite are cut by 'intrusive' rhyolite.

Three diorite bodies of irregular shape intrude the basic lavas in the southern part of lots 11, 12, 13, and 14 of range I, Duprat township.

The largest mass of quartz diorite in the map-area is about 800 feet wide by half a mile long, and is on lots 17 and 18 of range I. This mass is surrounded by rhyolite, and, in several places, dykes and small bodies of the latter intrude it. Irregular bodies of diorite in the northern part of lots 22, 23, and 24 of range I are similarly intruded by rhyolite. In the southern part of lot 20, however, two diorite dykes intrude the rhyolite. Similarly, in lot 13 of range X, Beauchastel township, a diorite dyke cuts across a tongue of intrusive rhyolite. Many other bodies of these dioritic intrusives occur within the area, but, in general, data are lacking to determine their relationship to the surrounding rocks.

Dioritic rocks of similar appearance intrude the Flavrian granite mass. Most of these are dykes which strike easterly. Examined in thin sections, some of these rocks are seen to have a diabasic texture. All contain over 50 per cent hornblende, together with much-altered feldspars and a small amount of quartz. One of the specimens examined contains pyroxene.

Flavrian (Albite) Granite

The eastern part of the map-area is underlain by granite - the western portion of the Flavrian granite mass. It is a massive, medium to coarse grained rock and it weathers light-grey or pink. Feldspar, quartz, and a few shreds of chlorite, are visible in hand specimens. The thin sections examined consist essentially of albite and quartz, with smaller amounts of chlorite and biotite. Two sections contain small amounts of hornblende, which was probably the original ferromagnesian mineral of the rock.

Parts of the mass are fine grained and contain practically no ferromagnesian minerals. Small bodies and dykes of aplite and quartz porphyry intrude the mass and are probably genetically related to it. No pegmatite bodies were seen.

The contact between the granite mass and the rocks it intrudes is remarkably regular in strike with the exception of a tongue which extends westward from the main mass in lots 23 and 24 of range II, Duprat township. 'Ghosts' of assimilated fragments of the intruded rocks can be seen in the outcrops of this tongue. The western end of the tongue is surrounded by an igneous breccia which is described below.

Saint-Jude Igneous Breccia

A body of igneous breccia lies along the western margin of the granite mass, in lots 22, 23, 24, and 25 of range II, Duprat township, and a smaller body of similar rock is exposed a

short distance to the south. The matrix is granitic material which is very fine grained, but in places its constituent minerals are megascopically discernible. Thin sections show it to be composed of a fine aggregate of quartz and albite with a few scattered shreds of chlorite. The fragments consist of diorite and of basic and acidic volcanic rock and are from a few inches to twenty feet in diameter. Some are rounded but many are angular. Away from the granite mass, they increase in size until the breccia passes into fractured country rock, with the fractures filled with fine granitic material.

Rarely, the fragments are surrounded by quartz, which in one instance was found to contain chalcopyrite.

Because the granite matrix forms only a small fraction of the mass of the breccia, it was considered preferable to map the latter as a unit rather than as a part of the granite.

Minor Acidic Intrusives

In addition to the 'intrusive rhyolites' already discussed, there are in the area other minor acidic intrusives of various types, including aplite, quartz porphyry and feldspar porphyry, syenite porphyry, and the Twin Lake feldspar-quartz porphyry mass.

Small bodies and dykes of aplite and quartz porphyry are common near the margin of the Flavrian granite mass, intruding both the granite and the adjoining rocks. In both types the rock is light grey on a fresh surface and weathers white. Small phenocrysts of dark quartz are visible in the porphyry, which, in thin section, is seen to consist largely of quartz and albite, partly in granophyric intergrowth. In their acidic character and high content of sodic feldspar, the aplite and quartz porphyry closely resemble the Flavrian granite, and their proximity to the latter suggests that they may be genetically related to this intrusive body.

On lots 20 and 21, of range I, Duprat township, some peculiar quartz porphyry dykes were traced for considerable distances. These dykes show a consistent parallel banding of the mineral constituents, which is so marked that it closely resembles bedding. It is probably a result of silicification and recrystallization of the dykes, with concentration of secondary quartz along former lines of magmatic flow.

The largest quartz porphyry mass in the area, a lenticular body about three-quarters of a mile long, occurs in lots 10, 11, and 12 of range I, Duprat township. On fresh surface the rock is light grey and glassy, with numerous small phenocrysts of dark quartz. In thin section it is seen to consist of phenocrysts of albite and quartz in a cryptocrystalline groundmass of feldspar, quartz, and a little chlorite and sericite.

A few small dykes of syenite porphyry, similar to that of the Aldermac stock, were seen in lots 23, 24 and 25 of range IX, Beauchastel township. These are light pink rocks with well formed phenocrysts of feldspar which are from an eighth of an inch to one inch in length, most of them oriented parallel to the walls of the dyke. Gussow (1) reports a similar dyke cutting the Flavrian granite mass.

(1) GUSSOW, W.G., Petrogeny of the Major Acid Intrusives of the Rouyn-Bell River Area of Northwestern Quebec; Trans. Roy. Soc. Canada, Vol.XXXI, Section IV, 1937, p.160.

The northeast corner of the Twin Lake feldspar-quartz porphyry body outcrops in lots 12 and 13 of range IX, Beauchastel township. Euhedral phenocrysts of feldspar and quartz are distributed through a fine-grained pink groundmass. The phenocrysts show a remarkable uniformity in size. Most of the feldspars are about half an inch long, and the quartz crystals a quarter of an inch. The Twin Lake body resembles the Aldermac porphyry to the south, but the latter is much poorer in quartz and is described as a composite stock. Only a few, small dykes were seen intruding the Twin Lake mass and they apparently differ from the latter only in being fine grained. Small, white quartz veins, devoid of metallic mineralization, were also seen cutting the porphyry. Thin sections show that the feldspar phenocrysts are fresh microcline and that the groundmass is a fine granular aggregate of albite and quartz. A few small bodies and dykes of similar porphyry are found in the vicinity of Twin lake.

Following is an analysis of a sample of the porphyry consisting of six specimens taken at random along the northern margin of the Twin Lake body:

Twin Lake Feldspar-Quartz Porphyry

(Analysis by Quebec Bureau of Mines)

SiO_2	72.04
Al_2O_3	15.64
Fe_2O_3	0.54
FeO	0.00
MgO	0.05
CaO	0.00
Na_2O	4.17
K_2O	7.47
H_2O-	trace
H_2O+	0.31
TiO_2	0.00
P_2O_5	0.02
MnO	0.00
	100.24

On account of the high content of alumina and alkalies, this rock is of possible interest for use in the glass or ceramic industries, if the tenor of iron can be reduced by a magnetic separation.

Mica Lamprophyre

Black mica lamprophyre occurs in a few isolated outcrops in lot 26 of range I, Duprat township, and as a dyke cutting rhyolite in lot 23. Similar rock was seen at two places as inclusions in the Flavrian granite mass, proving that it is at least older than the granite. The striking feature of these dykes is the inclusion in them of well-rounded pebbles of other rocks. Pebbles were seen of diorite and granite gneiss, and of acidic and basic volcanics.

Pleistocene and Recent

Most of the unconsolidated deposits of the area are of sand and boulder clay. Gravel was seen in a few localities. Near the shaft of Flavrian Gold Mines, trenches expose varved clays.

STRUCTURAL GEOLOGY

The large amount of intrusive rock in the map-area makes it difficult to determine much of the structure. The more basic lavas in the northern and western parts of the area have well formed pillows, and inasmuch as these have not been noticeably flattened, they afford a basis for determining the attitude of the flows. They indicate that in the western part of the area the flows strike east, face south, and dip steeply south. Farther east, the strike swings toward the north, the dip continuing to be steep toward the southeast and east. A few flow contacts in the southwest part of the area indicate that here the flows strike a little south of east.

Few of the rocks of the area are schistose. Some of those in the southern part display a weak southwest-trending schistosity, but farther north no schistosity was seen.

No prominent shears were traced out in the area, but a few faults were seen. The shaft of Flavrian Gold Mines is on a nearly vertical, east-trending fault, which has a well defined mud seam. Branching from the fault are a number of small quartz stringers which strike northeast and are vertical. If these occupy tension cracks, they would indicate that the movement was predominantly horizontal and that the north side moved west.

About a thousand feet to the northeast of the shaft, a poorly defined mineralized shear-zone strikes N.57°E. and crosses the side of a small hill.

On lot 14, range IX, Beauchastel township, there are two outcrops of a vertical feldspar porphyry dyke but, projected along the strike, one outcrop is displaced 200 feet horizontally with reference to the other. This may indicate a fault.

The lower part of Smoky creek occupies a straight, well-defined northwest-trending valley, which passes through Flavrian lake and can be traced for several miles to the southeast. This valley is probably along a direction of strong fracturing, or a fault line. However, no displacements of the formations along the valley can be seen.

ECONOMIC GEOLOGY

General Statement

Surface exploration work has been conducted at a number of places in the map-area, and a limited amount of diamond drilling has been done. Gold, copper, and molybdenum mineralization have been found, but no commercial bodies containing these metals have been developed.

Most of the known gold-bearing quartz veins are in the eastern part of the map-area. The common metallic minerals of these veins are pyrite, chalcopyrite, galena, and specularite, and free gold has been reported in some of them. Many of the veins have silicified wall-rocks which contain small amounts of gold.

Molybdenum-bearing quartz veins have been found in the southwest part of the map-area. The quartz is glassy and white and contains pyrite, molybdenite, and molybdite. Assay of samples of these veins indicate a negligible gold content.

Description of Properties

Flavrian Gold Mines, Limited

This property of about 480 acres consists of 12 claims in lots 19 to 28 of range I, Duprat township. The shaft-house, and other buildings have been erected on the central part of lots 24 and 25. The property was staked in 1929 following a discovery of gold by George Birrel, and Birrel Gold Mines, Limited, was formed to carry on preliminary exploration. Subsequently, Flavrian Gold Mines, Limited, was incorporated and acquired the claims. An option on the property was held by Ventures, Limited, in 1935, and by Howie Gold Mines, Limited, in 1939. Both companies did some diamond drilling.

The earliest work was concentrated on what is known as the Shaft vein, in the central part of lot 25. A strong fault marked by a seam of mud and from two to six inches of gouge, crosses a small knoll. Trenching at intervals revealed a silicified and mineralized zone on either side of the fault, and exposed two lenses of quartz adjoining the fault. The more easterly is 60 feet long and has an average width of about one foot. The other is about 120 feet long and averages two feet wide.

The faulted rocks are andesitic lavas cut by intrusive rhyolite. On the north side of the fault, rhyolite is the more abundant rock; on the south side, andesite. A small outcrop of diorite is exposed a short distance to the southeast of the shaft. Nine diamond-drill holes, put down to explore the zone, intersected rhyolite and andesite.

Sampling of the surface workings by the Company indicated the presence of gold in the quartz lenses and in the silicified walls of the fault. The best assays were obtained from the lenses of quartz, two bulk samples of which contained 0.70 and 0.90 ounce of gold per ton (1). All the drill holes intersected zones of silicification and mineralization, and some of them cut quartz, but the results were not as encouraging as those from the surface trenches. Both quartz and wall-rock contain fine-grained pyrite with smaller amounts of chalcopyrite and hematite. Free gold is reported to have been found in many places along the zone, both in the quartz and in the wall-rock.

A vertical shaft has been sunk to a depth of 325 feet on the mineralized zone between the two quartz lenses. For the first 150 feet it is in andesite cut by intrusive rhyolite and below this in rhyolite alone. The fault persists in the sides of the shaft to a depth of 260 feet, where it passes into the south wall.

On lot 26, about 1,500 feet northeast of the shaft, some work has been done on a poorly defined shear which strikes N.57°E. and is exposed along the side of a hill for about 125 feet. Along the shear the andesite is silicified and is injected parallel to the schistosity by small stringers of quartz for widths as much as ten feet. Fine grains of pyrite and a little chalcopyrite occur both in the quartz stringers and in the country rock, and free gold is reported to have been found at various points along the zone over a length of 105 feet.

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(1) Data from records of Flavrian Gold Mines, Limited.

A bulk sample of 4,500 pounds taken from the shear is reported by the Company to have contained 0.44 ounce of gold per ton. Ventures, Limited, working under an option agreement, put down eleven diamond-drill holes at forty- to fifty-foot intervals to explore the zone. Data from the drill holes is reported to have indicated that the shear is persistent but that the gold content is low and erratic.

On the northern part of lot 24, a few shallow trenches expose a vein for about eighty feet along the edge of a small outcrop of rhyolite. The vein, which strikes N.25°E. and dips 45°S.E., is from one to three feet wide. It consists of pink silicified material cut by stringers of white quartz, both of which contain abundant fine-grained pyrite and some galena. Company plans indicate that the vein has an encouraging tenor of gold. A chip sample taken by the writer over a width of two and a half feet of vein assayed 0.049 ounce of gold per ton.(1).

A number of old trenches were seen in the southern part of lots 21 and 22. At the time of visit, the walls had caved and no rock could be seen. The following information is taken from a report on this occurrence by S.H. Ross for the Quebec Bureau of Mines in 1938 (2). The trenches exposed a gabbro dyke which intrudes rhyolite. It strikes southeast and dips about 60° southwest. The south contact of the dyke is sheared for a width of about six feet and is intruded by a quartz vein from one to four feet wide, and by smaller quartz stringers. The vein, which has been traced along the south contact of the dyke for 500 feet, contains disseminated pyrite and some carbonate. Two samples taken by Mr. Ross assayed 0.01 and 0.22 ounce of gold per ton.

The most recent work on the property was on the southern part of lot 23. A poorly defined shear in the rhyolite, trending a little west of north and dipping 30° west, has been traced by four trenches for a length of 400 feet. A number of stringers of white, glassy quartz in the shear contain pyrite and a little chalcopyrite and hematite. A mica lamprophyre dyke which cuts the rhyolite in two of the trenches has also been sheared and mineralized. Company reports show that encouraging gold assays were obtained over 24-foot and 45-foot horizontal widths in the two central trenches. Howie Gold Mines, Limited, at the time they held an option on the property, put down nine diamond-drill holes near the discovery. Silicification, mineralization, and a few stringers of quartz, were encountered in the drill core at various depths, but no vein material was found comparable to that on the surface.

Saint Jude Gold Mines, Limited

Saint Jude Gold Mines, Limited, hold a group of claims in lots 17 to 28 of range II, and in the northern part of lots 21 to 27 of range I, Duprat township. Log camp buildings have been erected on lot 26, range II, near the north end of Flavrian lake. Considerable trenching has been done on the property and a few diamond-drill holes have been put down.

(1) All samples taken by the writer were assayed in the laboratories of the Bureau of Mines. They were collected for the purpose of determining whether or not they contained gold and other valuable metals and not with any idea of attempting to evaluate the several occurrences as commercial mineral deposits.

(2) Que. Bur. Mines, P.R. No.135, p.12.

Most of the work was done near the north boundary of lots 22 and 23, range I. A number of trenches and pits have been opened on several narrow veins of quartz, which strike slightly east of north and dip east at 30° to 40°. Many of the pits were filled with water at the time the writer visited the property, so that it was not possible to trace individual veins for any distance. According to Company plans, one vein was traced for 1,000 feet, and others for 400 and 500 feet. Most of them have horizontal widths of a few inches to two feet and they occur from 60 to 80 feet apart in a zone about 1,000 feet wide. The walls show little schistosity and probably the veins occupy tension openings. The quartz veins contain considerable pyrite and smaller amounts of chalcopyrite and galena. Company records state that free gold was found in several places in the veins and that some grab samples assayed several ounces of gold per ton. Also that, while gold values in general were erratic, the longest vein had a section 600 feet long and less than a foot wide that carried consistently good gold values. The veins are in altered andesite, which is cut by a few irregular-shaped bodies of intrusive rhyolite and by dykes of quartz porphyry and lamprophyre. One lamprophyre dyke adjoins the main vein for 200 feet and is evidently of pre-mineralization age. Assay of a sample of the dyke taken from beside the vein showed that it contains some gold.

On lots 23 and 24 of range II, a quartz vein in the Flavrian granite, near the margin of the mass, has been traced for about 400 feet by a series of trenches. The vein is from six inches to two and a half feet wide and strikes N.70°E., with dip steep to the north. It contains considerable coarse pyrite and Company plans indicate that it carries some gold. A grab sample taken by the writer assayed 0.088 ounce of gold per ton. This vein was being diamond-drilled at the time the property was visited.

About 700 feet to the west, along the same strike, some old trenches expose a vain of white quartz which contains coarse pyrite and may be a continuation of the vein just described. Here, however, the vein is in intrusive breccia.

Near the north end of lot 26, range I, a trench exposes a four-inch vein of glassy, white quartz containing chalcopyrite, pyrite, and galena. It strikes N.38°E. and dips about 30°E. The rhyolite wall-rock is silicified and mineralized for a width of about a foot on either side of the vein. A chip sample taken by the writer across six inches of vein and wall-rock assayed 0.068 ounce of gold per ton.

In lot 24 of range II, a small quartz vein, with strike N.65°E. and dip 40°S., cuts the intrusive breccia near its southern margin. It is exposed for thirty feet and is from one to three feet wide. The vein has well-silicified walls and is mineralized with coarse pyrite. A grab sample taken by the writer assayed 0.006 ounce of gold per ton.

In the northern part of lot 24, range I, a tongue of rhyolite intrudes an outcrop of quartz diorite. A weak fracture zone in the rhyolite strikes N.10°E. and is exposed for about sixty feet. Irregular stringers of white quartz occupy the fractures over a maximum width of twenty-five feet. Both the stringers and the rhyolite are mineralized with a little pyrite, chalcopyrite, and hematite. Company records show that low gold assays were obtained from samples taken from the surface, and also from the core

of two diamond-drill holes that were put down to intersect the zone at depth. A grab sample taken from the surface by the writer assayed 0.073 ounce of gold per ton.

Trenches in lots 21 and 22 of range II have exposed a few narrow, northerly trending fractures containing veins of chalcopyrite. These are rarely more than a few inches wide and hence are not of economic importance.

Benkor Gold Mines (Quebec), Limited

Benkor Gold Mines control a group of claims aggregating about 930 acres in ranges IX and X of Beauchastel township. They cover parts of lots 26 to 31 of range IX and the southern parts of the same lots of range X, lies within the map-area. It is underlain for the most part by the Flavrian granite.

In the northern part of lot 29, range IX, a shear-zone is exposed in a trench. The shearing lies along the south contact between the granite and a quartz diorite dyke which strikes about N.80°W. and dips 35°S. A number of quartz stringers from three inches to two feet wide occur over a width of fifteen feet. The quartz is white and glassy and contains considerable coarse pyrite and chalcopyrite. A grab sample of the quartz taken by the writer assayed 0.006 ounce of gold per ton. The dyke outcrops again about 500 feet to the west, but here no shearing was seen near its margins.

In the west-central part of lot 28, range IX, a shear is exposed along the east side of an outcrop of granite. It strikes about N.28°W. and dips 40°W. Stringers of quartz with much coarse pyrite constitute about 70 per cent of the rock for a width of three feet.

Rainville Group

The Rainville group of claims occupies parts of lots 13 to 15 of range I, Duprat township, and parts of lots 11 to 14 of range X, Beauchastel township. Log camp-buildings have been erected in the southern part of lot 14, range I.

In the central part of this lot, an outcrop of fractured quartz porphyry, about 120 feet long, is cut by a network of irregular stringers of quartz with diverse widths and attitudes. These contain some pyrite and a little molybdenite. A diamond-drill hole was put down from the east to explore this occurrence at depth. A grab sample from some of the quartz which contained sulphides gave a trace in gold.

At the north end of Twin lake, in lot 14, range X, a deep pit exposes a quartz vein about ten feet wide, which strikes N.20°E. and dips 70°E. The quartz is white and fractured and contains a small amount of pyrite. A chip sample taken across the width of the vein assayed 0.005 ounce of gold per ton.

Stripping on lot 13, on the west shore of the north end of Twin lake, disclosed, in a fracture zone in the rhyolite, irregular stringers of quartz containing a little pyrite and molybdenite. A grab sample of some of the quartz assayed 0.003 ounce of gold per ton.

Two other veins were seen in pits in the central part of

lot 12, range X, but neither was traced for more than a short distance. A grab sample from one of these, a four-foot shear-zone consisting of quartz and rhyolite in about equal amount, assayed 0.013 ounce of gold per ton and 0.08 per cent molybdenite. The other vein, seven feet wide, consists of bluish quartz and contains a small amount of pyrite. A chip sample assayed 0.004 ounce of gold per ton.

All the samples mentioned in the above paragraphs were taken by the writer.

In the southern part of lot 13, range X, a wide vein of white quartz is exposed in intermittent outcrops for a length of 800 feet. No metallic mineralization was seen, nor signs of any work having been done on this vein.

Golconda Mines, Limited

Golconda Mines control claims aggregating about 480 acres in lots 15 to 21, of range I, Duprat township.

On lots 17 and 18, a zone of sulphide mineralization in quartz diorite has been explored by pits and trenches. When visited, most of these workings were filled with water or clay. According to Company plans, low gold assays were obtained at various points over a zone about 1,200 feet long and 600 feet wide, but no orebody was indicated.

Another property controlled by Golconda Mines consists of a block of 560 acres in lots 16 to 19, and the northern parts of lots 13, 14, 15, and 20, of range IX, and the southern parts of lots 15 and 16 of range X, Beauchastel township. Part of the Twin Lake mass of feldspar-quartz porphyry outcrops on this property. On lot 16, range IX, a vein of vitreous white quartz, which strikes N.55°E. and dips 70°S., is exposed in two trenches about 120 feet apart. The vein contains pyrite and molybdenite, the latter sporadically distributed, either along fractures or in small pockets within the quartz, which, owing to its presence, has a bluish appearance in places. Yellow stains of molybdite are also noticeable. The vein lies along the south margin of a small body of feldspar-quartz porphyry. Where exposed in the eastern trench, it is 4 ft. 1 in. wide. A chip sample taken by the writer across this width assayed only a trace of gold and molybdenite. In the western trench, the vein is 17 ft. 6 in. wide and contains more sulphides than in the eastern trench. Three samples taken in a line across the width from north to south assayed as follows:

Width	Gold	Molybdenite
6 feet	Trace	0.23 per cent
2½ "	Trace	0.42 " "
9 "	0.003 oz. per ton	nil " "

Yet another property controlled by Golconda Mines consists of 625 acres in lots 19 to 25 of range X, Beauchastel township. Near the north boundary of lots 22 and 23, three diamond-drill holes were put down to intersect the possible continuation of the mineralized shear in the rhyolite immediately north of the range line, on the property of Flavrian Gold Mines (see page 14). No indication of the Flavrian vein was obtained in the drill core.

Waite-Buffam Claims

The Waite-Buffam group consists of claims R.11975, 11977, 11980, and 11981, in lots 22 to 25 of ranges IX and X, Beauchastel township. In lot 24 of range IX, some old trenches expose a silicified zone in rhyolite which is mineralized with coarse pyrite and cut by small stringers of white quartz. This zone is near the granite-rhyolite contact and trends slightly east of north. The owners's plans indicate that the zone was traced for 360 feet and that encouraging gold assays were obtained over a 45-foot width in one trench and over a 25-foot width in another. Disappoiting results were reported from four holes which were diamond drilled to explore the zone from the west.

White Quartz Gold Mines, Limited

This Company controls claims aggregating about 400 acres in lots 15 to 18 of range X, Beauchastel township, and the southern parts of the same lots of range I, Duprat township.

A large vein of white quartz, in places as much as 60 feet wide, outcrops in the southern part of lot 16, range I. Three other outcroppings of this vein indicate that it extends across the map-area to the southern part of lot 10, range X, Beauchastel township, and from there it can be seen to continue for a long distance to the southwest of the map-area. The quartz does not appear to have come in as a single injection with clean-cut walls but rather as a network of quartz stringers,with the intervening rock so highly silicified that it is now almost pure quartz. No information was received as to any gold having been found in this vein.

In lot 16, small shears in the rhyolite immediately west of the outcrop of the large vein contain irregular veins of quartz which are mineralized with small amounts of pyrite and chalcopyrite.

Workman Claims

W.R. Workman and associates control claims R16598 to 16602, inclusive, in lots 27 to 31, range I, Duprat township. Most of the property is underlain by granite.

On lot 27, a deep pit was opened along the line of strike of the possible continuation of the gold-bearing shear some 600 feet to the southwest, on the property of Flavrian Gold Mines. This pit was full of water when visited. Other shallow trenches were seen in lot 28, but no mineralization was noted.

Other Occurrences of Gold and of Molybdenite

A few old trenches were seen in the northern part of lot 29, range II, Duprat township. One of these exposes a weak shear in andesite which strikes slightly west of north and dips 60°E. Stringers of quartz occupy fractures over a 10-foot width; and the intervening rock is partly silicified. A little pyrite and chalcopyrite were seen in both the quartz and the wall-rock. Another trench exposes a vein of white quartz which strikes N.20°W. and dips 42°E. This vein is from eight to fifteen inches wide and is exposed for thirty feet.

Along the east shore of Twin lake, on lots 14 and 15,

range X, Beauchastel township, are two outcrops containing molybdenite. A 4-foot vein of white quartz which contains pyrite and molybdenite is exposed in a pit at the shore of the lake. A selected sample which contained abundant sulphides assayed 0.004 ounce of gold per ton, and 0.53 per cent molybdenite. About 1,200 feet north of this, along the lakeshore, is an outcrop of fractured rhyolite containing stringers of quartz mineralized with some pyrite and molybdenite. A chip sample across six feet of this outcrop assayed 0.53 per cent molybdenite. Both samples were taken by the writer.

Small amounts of molybdenite were observed elsewhere in the southwest part of the map-area. In two places the mineral was seen in veins in small porphyry bodies. These molybdenite-bearing veins may be genetically related to the Twin Lake feldspar-quartz porphyry mass, and the area surrounding this intrusive merits careful prospecting for bodies containing commercial amounts of this mineral.

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