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PRELIMINARY REPORT ON HEBECOURT LAKE MAP-AREA, EAST PART OF HEBECOURT TOWNSHIP, ABITIBI-WEST COUNTY

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PRELIMINARY REPORT

ON

HÉBÉCOURT LAKE MAP-AREA

EAST PART OF HÉBÉCOURT TOWNSHIP

ABITIBI-WEST COUNTY

BY

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P. R. No. 216

HEBECOURT LAKE MAP-AREA

EAST PART OF HEBECOURT TOWNSHIP

by R. Bruce Graham

I N T R O D U C T I O N

During the summer of 1947 the writer mapped the geology of about 25 square miles in the eastern part of Hébécourt township, Abitibi-West county. The area is bounded on the east by the Hébécourt-Duparquet township line and on the west by the north-south centre line of Hébécourt township. From south to north it includes ranges V, VI, VII, VIII, and IX. Rock outcrops were mapped on a scale of 500 feet to one inch, and mapping of some of the critical areas was supplemented by a magnetometer survey. This map-area is included in part of the Palmarolle (1) and Duparquet (2) sheets. Immediately to the east is the Duparquet Lake map-area (3).

The area is reached by road from the town of Duparquet, which is 3 miles to the east. The northern part is accessible by two roads. The first leads north along the eastern border of the

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(1) Map No. 293A, Palmarolle Sheet, Abitibi County, Quebec; Geol. Surv. Can., 1934.

(2) Map No. 281A, Duparquet Sheet, Abitibi and Témiscamingue Counties, Quebec; Geol. Surv. Can., 1933.

(3) Graham, R. Bruce, Duparquet Lake Map-Area; Que. Dept. Mines, P.R. No. 206.

map-area through ranges VII, VIII, and IX. The south end of this road turns west at the north end of Duparquet lake in lot 37, range VII, and continues to the north end of Hébécourt lake, near the western boundary of the area. The second road follows the north boundary of range VIII from lot 34 in Duparquet township east to the Hébécourt-Duparquet township line, where it joins with the first road. The southern part of the area is accessible by boat through Duparquet, Bayard, and Hébécourt lakes.

GENERAL GEOLOGY

The consolidated rocks are all of Precambrian age. They consist of a series of slates, greywacke, and conglomerate and a series of volcanics formed from flows of trachyte, dacite, andesite, and basalt, together with minor beds of flow breccia, tuff, and agglomerate. Included in this complex are dykes and sills of related diabasic intrusives. Scattered bodies of gabbro with local diabasic and granitic phases intrude the volcanics.

Numerous shear zones occur throughout the area. They are most abundant in the south half of range VII, where they comprise part of what is known as the "Destor break" (1) or the Porcupine-Destor fault" (2). Intruded along these shear zones are scattered bodies of feldspar porphyry, syenitic feldspar porphyry, and quartz feldspar porphyry. They are later than the major fault movements but have been locally sheared as a result of subsequent motion along the faults into

(1) Bannerman, H.M., Lépine Lake Area, Destor Township, Abitibi County; Que. Bur. Mines, Geol. Rept. No. 4, 1940.

(2) Ambrose, J.W., Preliminary Map, Duparquet-Larder Lake-Rouyn Region, Ont. and Que.; Geol. Surv. Can., Paper 44-29, 1944.

which they were intruded. Later than the porphyry intrusions is a set of northerly trending joint-like faults with small displacements.

Following is a chronological table of the geological and structural data as determined in the area:

Table of Formations

Pleistocene and Recent			Muskeg, forest loam, gravel, sand, silt, clay, till
Great unconformity			
PRECAMBRIAN	Algoman(?)	Minor mineralization "Younger" faulting	
			Basic dykes and some siliceous dykes
		Mineralization Minor faulting	
			Syenitic feldspar porphyry Quartz feldspar porphyry Feldspar porphyry
		Intrusive contact Major faulting Folding	
	Post-Keewatin-type		Granite Diorite and gabbro (possibly post-folding)
	Intrusive contact		
	Keewatin-type	Cléricy sediments	Diabase, quartz diabase gabbro Trachyte, dacite, andesite, basalt, tuff, agglomerate, flow breccia, related hornblende schist, chlorite schist and sericite schist Conglomerate, greywacke, and slate with some interbedded lavas

Keewatin-Type

The Keewatin-type rocks of the area include conglomerate, greywacke, and slate of the Cléricy group and trachyte, dacite, andesite, and variolitic flows of basaltic composition. Flow breccia is common in the northwest part of Duparquet lake, whereas beds of agglomerate may be seen on the islands and along the shore of the southeast part of Hébécourt lake. Narrow beds of tuff occur in a few places in the lavas to the north of range VI. The volcanics are intruded by numerous diabasic and gabbroic dykes and sills, which are customarily termed "diorite" by those who work in the area.

Cléricy Sediments

The Cléricy sediments are composed mainly of slate and greywacke, a small amount of conglomerate, and some interbedded flows. This formation enters the area from the east, in the north part of range VI and the south half of range VII, where it has a width of 2,800 feet. In crossing Duparquet river, it diminishes abruptly to a width of 1,300 feet and is displaced several hundred feet to the north. It then continues on to the west, decreasing in width, until it apparently pinches out 4,000 feet from the river.

The Cléricy sediments have a general east-west strike and dip from vertical to 80° north. The top of the formation faces to the south and, consequently, is slightly overturned.

East of the Duparquet river, the sediments are separated from the volcanics to the south by a strong shear zone from 25 to 50 feet wide. The north or lower limit of the sediments is marked by a band of conglomerate 50 feet wide. It extends

from the Hébécourt-Duparquet township line west to Duparquet river - a distance of 2,000 feet. The contact of the conglomerate with the gabbro and trachyte which lie immediately to the north is not exposed. There is an apparent divergence of strike of about 20° between the lava flows exposed on an outcrop of trachyte and an exposure of conglomerate in a trench 50 feet to the south. The exposures are not sufficient to determine whether this divergence is due to faulting or folding, or whether it indicates a disconformity.

West of the river, no exposures of conglomerate were observed. Neither the north nor the south contact of the sediments is exposed. The sediments themselves lie along the main zone of the Porcupine-Destor fault and are highly sheared and carbonated. It is likely that the tapering of the sediments on this side of the river is due to the faulting which has taken place along this zone.

Trachyte

A prominent band of trachyte enters the area from the north in lot 37. It has been traced eastwards as far as lot 63, where it disappears under drift. Where last exposed, the north edge of the band lies about 1,600 feet south of the north boundary of the area. It has a width of at least 1,600 feet and a regional strike of north 80° west. A second band of trachyte outcrops immediately south of the north boundary of range VIII. It has been traced from lots 32 to 35 - a distance of 2,600 feet. The band strikes east-west and has a width of 200 feet. Several other small lenses of trachyte outcrop in the andesitic and basaltic flows in range IX and the north part of range VIII. They are however too small to be shown on the accompanying map.

Outcrops of trachyte weather light grey to ash-grey and in places reddish-brown in colour. Amygdules and pillow structures are common. On the fresh surface the trachyte is light grey. In places it breaks with a sub-conchoidal fracture. It is fine grained and has a massive texture.

Dacite and Andesite

Dacite and andesite predominate throughout the area. These rocks weather reddish-brown to green. Alternating pillowed and massive flows are common. On the fresh surface they are greyish-green and, except where they are sheared, have a fine-grained compact texture. Dacite is distinguished from the andesite only by the presence of minute quartz 'eyes'. The two rock types are not designated separately on the accompanying map.

Basalt

Basalt occurs throughout the area as numerous narrow flows and lens-like bodies. Two zones, in which basaltic flows predominate, have been outlined on the map. Elsewhere, owing to their subordinate development, they have not been distinguished from andesite and dacite.

The first zone lies along the south border of range VIII. It crosses from the eastern limit of the area to as far west as lot 38, where it disappears under drift. It has an average width of 800 feet. The second zone enters the area from the east and has been traced from outcrops and drilling as far west as lot 51. This zone has been traced an additional 2 1/3 miles due west by a magnetometer survey. Its width is usually from 600 to 800 feet, and it strikes approximately east-west.

Like andesite, basalt weathers reddish-brown to green. On the fresh surface it is fine to medium grained and dark green to olive-green in colour. Pillow structures are common. The basalt is distinguished from andesite mainly by its darker colour and higher specific gravity

Spherulitic Flows

A zone, consisting predominantly of pillowed spherulitic flows, enters the area from the north in lot 34, range IX. It has an average width of 300 feet and has been traced eastward to within 3,400 feet of the road leading north through the area. The western part of the zone of spherulitic flows has a general strike of 10° south of east as far east as lot 53, where it swings slightly to the north of east for the remainder of its exposed course. Numerous spherulitic flows outcrop throughout the remainder of the area but are not developed sufficiently to be shown on the accompanying map.

The lavas in the main spherulitic zone weather a variegated reddish-brown to light grey. Pillow structures are well developed and are from 8 inches to 10 feet in length and from 4 inches to 4 feet in width. The margins of the pillows usually contain a zone of spherules up to 4 inches in width. The interstices between the pillows contain a small amount of scoriaceous breccia. On the fresh surface the central portion of the pillows are medium to greenish-grey and aphanitic. In the spherulitic margins the spherules are the same colour as the central portions of the pillows, whereas the matrix is dark grey, a little coarser grained, and not so compact in texture.

Flow Breccia

A band, consisting predominantly of flow breccia, occupies the interval between the trachytic and spherulitic zones previously described. It has an average width of between 500 and 700 feet. Numerous other beds of flow breccia outcrop between Bayard lake and the east arm of Duparquet lake.

The band of flow breccia in range IX consists of buff-weathering andesitic pillowed flows, which are locally spherulitic and contain numerous light grey, angular to sub-angular, trachytic fragments. The pillows average 1½ feet long by 1 foot wide, and the fragments about 2 inches in diameter.

Tuff and Agglomerate

Tuff and agglomerate are commonest on several islands at the south end of Hébécourt lake. A few beds outcrop in the north part of range VII, but, on the whole, these rocks form an insignificant proportion of the volcanic complex.

Keewatin-type Intrusives

Intruding the lavas are dykes and sills of diabase, quartz diabase, and gabbro, which are termed "diorite" by those who have worked extensively within the area. Their close association with the lavas warrant the conclusion that they represent feeders and sills genetically related to the flows.

These intrusives, like the lavas, are rusty brown on the weathered surface, which in places is slightly pitted from the weathering of ferromagnesian minerals. On the fresh surface, the

rock is greenish-grey to olive-green in colour and similar in appearance to the massive, thick flows, except for the common development of a diabasic texture. These sills and dykes exhibit chilling effects at their contacts, but elsewhere the rock is medium to coarse grained.

Post-Keewatin-type Intrusives

Several widely scattered bodies of diorite and gabbro occur within the map-area. They are distinguished from the Keewatin-type intrusives by their larger size, their generally coarser grain, and the sporadic occurrence of banding, which apparently results from differentiation. A diabasic texture is locally developed, but it is not so common as in the Keewatin-type intrusives. A small boss of granite intrudes one of the diorite bodies. Because of its intimate relation to the diorite, it has been tentatively included with the post-Keewatin-type intrusives.

Gabbro

Three small bodies of gabbro outcrop within the map-area. The first outcrops along the north boundary range IX, from lots 50 to 53. The second body outcrops along the south boundary of range VIII, from lots 52 to 54, and the third outcrops at the north end of Duparquet lake, in lots 54 and 55.

Gabbro outcrops weather brown and are speckled with greenish-black ferro-magnesian minerals from 1/10 to 1/2 inch in diameter. Where a diabasic texture is developed, the feldspar occurs as well developed grey laths in a brownish matrix. On the fresh surface the rock is variable

in colour and grain size. The composition varies from 80 per cent greenish feldspar and 20 per cent ferro-magnesian minerals to 95 per cent ferro-magnesian minerals and 5 per cent greenish feldspar. The grain size in the coarser-grained phases averages about 1/4 inch in diameter, but in the fine-grained portions it is considerably smaller and difficult to distinguish from the massive flows.

Diorite

An east-west trending body of diorite outcrops at the western border of the map-area in the north part of range VI. It has been traced for a length of 2¼ miles. The mass attains a maximum width of 3,500 feet and diminishes towards the east, but extensive overburden prevents any definite outlining of the body at this end. Two northwestwardly trending sill-like bodies of diorite enter the area in the southeast corner of the map-sheet. The most eastwardly one has been traced within the area for a length of 3,000 feet. It has an average width of 600 feet. The other body has been traced for 4,200 feet and has an average width of 300 feet. Numerous other small dykes and sills of diorite cut the volcanics in this vicinity. They have not however been distinguished on the accompanying map.

The diorite has a granitic texture and the grain size is from medium to coarse. The typical coarse-grained diorite contains about equal proportions of grey to pink feldspar and ferro-magnesian minerals. A few gabbroic facies are present but occur as bodies too small to be mapped.

Granite

Medium- to coarse-grained pink granite outcrops in the diorite on the east shore of Hébécourt

lake, about 1,200 feet south of the north boundary of range VI. It is exposed along the shore of the lake for 600 feet. Numerous small dykes of granite cut the diorite nearby. To the south, the main body of granite apparently grades through quartz diorite into diorite. Elsewhere, the contacts of the granite with the diorite were not exposed.

Algoman(?)

Syenitic Feldspar Porphyry

A lens-shaped body of syenitic feldspar porphyry outcrops adjacent to a shear zone along the north boundary of range VII, between lots 38 and 40. It strikes slightly north of east, has an exposed length of 1,900 feet, and a maximum width of 450 feet. A small east-westwardly striking dyke crosses the north tip of the promontory on the east side of Duparquet lake, 1,400 feet south of the north boundary of range VI.

Outcrops of syenitic feldspar porphyry weather pink to greenish-pink. The fresh surface is greenish-pink and fine grained. The phenocrysts are pink feldspar laths up to $\frac{1}{4}$ inch in length. The matrix is a fine grained to aphanitic aggregate of pink feldspar and chlorite.

Quartz Feldspar Porphyry

Several lens-like bodies of quartz feldspar porphyry outcrop within the area. One body outcrops on the east side of Duparquet river several hundred feet north of the south boundary of range VII. It extends from the river eastward into the Duparquet Lake map-area. Within the present area it has a maximum width of 350 feet.

A second body outcrops on the west side of the river about 800 feet north of the first body. It is possible that these two bodies were once continuous and have been separated by north-south faulting. This second body extends 1,900 feet west of the river, has a maximum width of 450 feet and an east-west strike. A third body outcrops in lot 46, 1,600 feet south of the north boundary of range VIII. Several other minor bodies of quartz feldspar porphyry outcrop in the area and their location is shown on the accompanying map. In every case these bodies of porphyry are associated with zones of shearing.

The quartz feldspar porphyry is a grey to sea-green rock, light grey on weathered surfaces. Stubby feldspar phenocrysts form about 40 per cent of the rock, whereas stout quartz crystals form about 1 per cent. The phenocrysts average from 1/4 to 1/16 inch in diameter. Some books of mica which has been altered to chlorite are up to 1/3 inch across. The matrix is aphanitic and consists of quartz sericite and feldspar.

Feldspar Porphyry

The two bodies of quartz feldspar porphyry which lie on either side of Duparquet river contain phases in which the quartz phenocrysts are lacking. Otherwise, the two varieties are identical. Relationship between the two varieties could not be determined as no contacts were found. The feldspar porphyry is best seen on the exposures which lie along the south side of the porphyry lens in the middle of range VII, immediately west of Duparquet river.

Basic Dykes

Dykes of fine-grained basalt, andesite, and porphyritic andesite intrude the lavas and

post-Keewatin-type gabbro and diorite. They are commonest in the south part of the map-area in ranges V and VI. A northeastwardly trending swarm of these dykes strikes through Hébécourt lake. They occur up to 30 feet wide and have clearly marked chilled contacts against the country rocks. The porphyritic varieties contain well developed lath-shaped phenocrysts of grey feldspar. They average $\frac{1}{4}$ inch in length, but crystals up to $\frac{1}{2}$ inch long in the wider dykes are not uncommon.

Acidic Dykes

Several acidic dykes were found in close association with the basic dykes. They occur up to 20 feet in width and are light grey in colour; the texture of this rock is almost cherty. They definitely cut across the strike of the flows in which they are found. Many flows in the vicinity of these dykes are altered to light grey fine-grained siliceous rocks in which the pillow structures are well preserved.

STRUCTURE

Folding

A syncline crosses the area in ranges V and VI, south of the Porcupine-Destor break. The axis of the syncline enters the area at the junction of range-line V-VI with the Hébécourt-Duparquet township line. Here it has a northwest strike, but, a short distance west, the axis curves until it assumes an east-west strike, passing just north of Bayard creek, through the south part of Mely lake and across the south end of Hébécourt lake. In many places dips on the limbs of the syncline could not be determined, but such

information as was available indicates that both the north and south limbs are vertical. This syncline represents the westward extension of the syncline which was mapped in the adjacent Duparquet Lake map-area (1).

In ranges VII and VIII, north of the Porcupine-Destor break, the formations trend about east-west. In range IX they strike slightly north of west. They face south and dip vertically or are overturned up to 25° to the north.

Faulting

Two ages of faulting have been recognized within the map-area. The older faults strike between northeast and slightly south of west. They are characterized by zones of shearing. The younger faults offset the older and strike from 30° east of north to 30° west of north. Their fault planes are inconspicuous, and, when they are exposed, they are seen to consist of narrow slickensided joint-like planes.

Older Faults.- Most of the movement appurtenant to the older faults occurred before the Algoman (?) intrusions. Subordinate movements took place along these faults after intrusion of the feldspar, quartz feldspar and syenitic porphyries. These were sufficient to fracture and shear them, but displacements were insignificant. This period of faulting finished before the intrusion of the basic dykes.

A zone of intense shearing enters the area from the east in the southern part of range VII. From there it trends slightly north of west to

(1) Graham, R. Bruce, Duparquet Lake Map-Area; Que. Dept. Mines, P.R. No. 206.

Duparquet river. Between the river and the road it is offset to the north, and to the west of the road it trends westwardly across the middle of range VII to the western border of the map-area. It leaves the area to the west somewhere within the limits shown on the map. It is regarded as the main zone of the Porcupine-Destor fault and has been designated as zone A on the map. This zone is from 100 to 900 feet wide and consists of chlorite, talc, and sericite schist, locally intensely carbonated. It dips from 75° to 80° to the south. To date, no displacements have been measured along zone A, but the total displacement is believed to have been considerable.

Subsidiary faults branch from the north side of zone A. The approximate position of three such faults are shown on the map. It is believed that there are more than have been found at present. Lack of outcrop and poor exposures make these faults difficult to locate, and in many places the positions shown are only approximate. Owing to the absence of persistent horizon markers, displacements along them could not be determined. The more important of these zones are described below.

One such shear zone is exposed in lots 39 and 40 straddling the north boundary of range VII. It strikes north 80° east and consists of a number of shears distributed over a width of 400 feet. A second shear zone is exposed on the sides of a few scattered outcrops between lots 51 and 54 in the north part of range VII. This second zone has a strike of north 70° west and a minimum width of 50 feet. A third zone lies 800 feet south of the second and has been traced from lots 53 to 60. It has a strike of north 80° west and is distributed over a width of about 200 feet.

A zone of shearing and silicification, which does not belong to the same set as the above, has been located in the north half of range VIII. It has been traced along the north side of a ridge from lots 46 to 48, and has a strike of 15° south of east. In the western part of the area along the north boundary of range VIII, there is a prominent east-west trending valley. The depression of the valley is so marked and persistent as to suggest a fault, although no shearing has been found along the flanks of the valley.

Several shear zones have been mapped in the eastern part of the area to the south of zone A. One of these has been traced from lot 52 to Duparquet river, along the south boundary of range VII. It dips 60° south and is about 70 feet wide. Another lies some 1,200 feet to the north and has been traced for the same distance. It strikes 10° to 20° south of east, dips 75° south, and is about 150 feet wide. At the western end of these two zones, two other shears form northeastwardly trending links between them.

Younger Faults.- There are many small faults in the area with a general trend varying from 35° east of north to 30° west of north. Steep dips and joint-like planes, along which movement has taken place, characterize their habitual mode of occurrence. They are later than the faulting previously described. Apparent horizontal displacements are usually only a few feet or less. Occasionally, larger displacements are found. Such a fault strikes northerly through Duparquet river. This fault offsets zone A, the Cléricy sediments, and adjacent formations towards the north on the west side of the fault. The amount of apparent horizontal displacement along this fault is greater than 500 feet. It has been observed that, when these faults strike northeast,

the movement is usually left handed and, when they strike northwest, the movement is usually right handed. Reversals of this rule have been observed in places. Some of the more noteworthy faults of this type are shown on the accompanying map.

Alteration

The alteration of most of the lavas and intrusives within the area is low grade. The rocks along the shear zones are altered to chlorite, sericite, and talc schists. Zone A is intensely carbonated and carbonatization is widespread along most of the other older faults within the area.

An area of pale-grey weather-bleached rocks lies along the north flank of the valley in which zone A is located. From lot 55 to Duparquet river this altered zone is between 1,800 and 3,000 feet wide.

Bleaching is a type of alteration associated with the Beattie and Donchester orebodies in the Duparquet Lake map-area. In the present map-area it is characterized by parallel lens-like streaks, up to a foot in width, of grey weathering rock in schistose greenstone. In the most intensely bleached areas, all the greenstone may have undergone this type of alteration. The bleached bands may in places contain numerous quartz 'eyes' up to 1/12 inch in diameter. On the fresh surface the rock is light grey, aphanitic, and compact to slightly schistose in texture. It is locally highly silicified, and, although silicification is apparently essential to bleaching, the degree of silicification is not necessarily a measure of the degree of bleaching to which the rocks have been subjected.

ECONOMIC GEOLOGY

Most of the prospecting in the area has been confined to ranges VI and VII, along some of the shear zones which comprise the Porcupine-Destor fault. A few assays showing a low tenor of gold have been reported, and, since the Porcupine-Destor fault zone is essentially a gold-bearing belt, this mineral is the one most likely to be found in commercial quantities within the area. By analogy with the several producing ore-bodies to the east, the following recommendations are suggested as important guides to prospecting:

A careful examination of all bodies of syenitic feldspar porphyry, quartz feldspar porphyry, feldspar porphyry, and the immediate vicinity of the bodies should be made for finely disseminated sulphides, which are frequently gold-bearing. Furthermore, any silicified breccia zones which may be found in these areas are especially favourable for the deposition of gold. In searching for the porphyry bodies themselves, it is of value to note that they occur along shear zones, and, in greater detail, many occur where two shear zones converge or where shear zones change abruptly in strike.

In the past, much time and money have been spent in prospecting the intensely carbonatized schists occurring along zone A. To date, the results have been disappointing. The sterility of these zones with regard to gold mineralization is a regional feature, and one would be well advised to consider this fact carefully before doing extensive work on these admittedly attractive-looking zones.

PROPERTIES

Wettring Gold Mines, Limited

The property of Wettring Gold Mines consists of 1,422 acres in Hébécourt and Duparquet townships. In Hébécourt township it includes lots 55 to 59, the north half of lots 60 and 61, all of lot 62, in range VII, and two claims immediately south of lot 62 in range VI. In Duparquet township, it includes lots 1, 2, and 4 and the south half of lots 5, 6, and 7, in range VII, and three claims adjacent to the township line in the north part of range VI.

The property straddles zone A and several subsidiary faults both to the north and south. These are shown on the regional map. The Cléricy sediments underlie the central portion and are intruded by a composite body of feldspar and quartz feldspar porphyry, immediately east and west of the Duparquet river. This body lies just to the north of zone A, is much fractured and locally sheared and carbonatized. To the north is an extensive area of bleached lavas which have been described on page 17. South of the porphyry mass and the Cléricy sediments, the property is underlain by spherulitic, basaltic, and andesitic flows. A small body of gabbro outcrops in the southwest corner of the property, and several dioritic sills outcrop immediately north of zone A.

A total of 10,663 feet of drilling has been completed on the property. Most of the drilling has been confined to the sediments off the west and southwest end of the porphyry body in lots 57 and 58, range VII. Several other holes have been drilled in the bleached lavas farther to the west and north. Numerous assays

showed the gold tenor to be low and scattered; the best were 0.26, 0.19, and 0.14 oz. of gold per ton.

It is of interest to note that, except for a small amount of trenching and stripping, the porphyry body itself has scarcely been touched. Owing to the fracturing and shearing observed within this porphyry mass, a careful examination of this body is well warranted.

Consolidated Beattie Mines, Limited

Consolidated Beattie Mines holds lots 49 to 54 in range VII, Hébécourt township. This claim-group straddles zone A and contains several other shear zones, which are shown on the map. From the northern boundary south to zone A, bed-rock consists of andesitic flows. Just to the north of zone A, there are several dioritic sills, which are probably related to the volcanic complex. Immediately south of zone A is a band of basaltic flows, which strike about east-west and are from 600 to 800 feet wide. These are followed to the southern border by andesitic flows containing some basalt. A body of gabbro outcrops in the extreme southeast corner of the property.

Zone A passes in an east-west direction across the middle of the property. Its course is marked by a pronounced valley about 700 feet wide. On either flank of the valley, overburden is shallow, and a few scattered outcrops are visible. On the north side of the valley in lots 52 and 53, trenching has opened up a zone of carbonatized and bleached schists for a length of 1,600 feet. Cutting these schists are numerous fractured milky quartz veins, which are locally carbonatized and mineralized with disseminated pyrite. These occur up to 3 feet wide, strike

east-west to slightly north of east, and dip nearly vertically. Several samples from one of these veins are reported to contain commercial tenors of gold, the highest being 0.38 oz. per ton. A small amount of diamond drilling was done on these veins in the fall of 1946, but results were disappointing.

On the south flank of the valley, several trenches have opened up a zone of easterly trending schists for a length of 200 feet. Cutting these schists are several quartz veins similar to those across the valley. They strike approximately east-west, dip nearly vertically, and occur up to 3 feet wide.

St. Francis Mining Company, Limited

In 1947, St. Francis Mining Company optioned two groups in Hébécourt township from Consolidated Beattie Mines. The most westerly consists of lots 30 to 36 in range VII. The other consists of lots 38 to 41 in ranges VII and VIII.

In the western group the property is extensively drift-covered. Only fourteen outcrops were found and these were mostly along the north or south boundaries. These outcrops consist of andesite, andesitic flow breccia, basalt, and, in the southeast corner of lot 35, some diorite. The projection of zone A westwardly along its strike passes across the centre of the group.

In the fall of 1946, Beattie did some diamond drilling in the south part of lots 35 and 36. One small porphyry dyke was intersected in the drilling. The other rocks consisted of trachyte and andesite. No other work has been reported from this group.

The second group of claims is also largely drift-covered. High ground with scattered outcrops occurs along the north boundary of ranges VII and VIII, and just north of the range-VII road. Zone A, if it continues on strike, would pass through the central part of range VII. No outcrops are exposed in this vicinity. A band of basalt outcrops along range-line VII-VIII. A zone of shearing occupies the central portion of the band, and along it is intruded a lens-like body of syenitic feldspar porphyry about 2,000 feet long and 300 feet wide. The basalt to the north of the porphyry is bleached, silicified, and locally mineralized with finely disseminated pyrite. The porphyry is locally sheared and mineralized with pyrite. The remaining bed-rock on the property consists of andesite with a small amount of trachyte and some diorite along the south edge.

A small amount of old trenching was observed in the porphyry, but no work has been reported from this group. The shearing and the presence of bleaching and porphyry along range-line VII-VIII, in lots 38 to 40, suggest that this is the most favourable locality of either group for further prospecting.

Hébécourt Gold Mines, Limited

The property of Hébécourt Gold Mines consists of lots 37, and 42 to 48, in range VII, Hébécourt township. Except for the three most easterly lots, the property is almost devoid of outcrop. Zone A apparently passes through the property about 1,700 feet south of the north boundary. Just north of zone A, the rocks are silicified and bleached andesite. The bleaching dies out within 600 feet of the north boundary. In the eastern part of the property a band of agglomerate and tuff parallels range-line VII-VIII,

about 300 feet to the south. South of zone A, the rocks are also dominantly andesite, although a band of basalt is shown on the map to lie immediately south of zone A.

This band represents the western extension of a basaltic horizon which lies a short distance to the east. Along the southwestern border of the property, the bed-rock consists of diorite.

During June and August of 1946, a magnetometer survey was carried out on all the property except lot 37. Several magnetic 'anomalies' were located. The most pronounced of these occurred in the middle of range VII, along the assumed strike of the basaltic horizon which outcrops farther east. In the fall of 1947, the magnetometer survey was completed in lot 37. Several other magnetic anomalies were then located. One of these occurs along the strike of the syenitic feldspar porphyry outcropping on the St. Francis group, about 700 feet west of the last porphyry outcrop. The anomaly also has the same strike as the shear zone which passes through the porphyry mass. The close association of this anomaly to the porphyry merits careful consideration, as there is a possibility that mineralized porphyry and associated shearing, which is a favourable combination for localization of a gold deposit, may underlie this area.

Corrigan Claims

A group of claims in the north half of range V and the south half of range VI, between Duparquet and Hébécourt lakes, was prospected in the summers of 1946 and 1947. Several quartz veins were examined. One vein, situated 300 feet south of the east-west centre line of Hébécourt township, 2,100 feet west of mile-post VIII-IX,

was trenched for about 50 feet. The vein, which strikes north 35° west, occurs in sheared andesite and parallels the schistosity. It dips vertically and is composed of a number of quartz and calcite stringers, which are mineralized with a little pyrite and chalcopyrite. No gold assays of commercial grade were reported.

Kellar Group

The Kellar group consists of ten claims on the south shore of Duparquet lake, one mile north of the southeast corner of Hébécourt township. A boss of dark red syenitic feldspar porphyry lies in the middle of the property. It extends 1/4 of a mile in a north-south direction and is about 1/8 of a mile across. The porphyry intrudes massive coarse-grained amphibolite. A zone of shearing, which strikes 10° north of east, follows the south shore of the lake. It crosses the north end of the porphyry in the channel between the mainland and an island a short distance off shore. The porphyry on the south part of the island is sheared. The amphibolite along the eastern contact with the porphyry is also sheared, whereas the porphyry at the contact is massive. This possibly represents a fault striking about 20° east of north.

A north-south trench 50 feet long, situated on the shore of the bay just south of the island, has exposed a fractured zone in the porphyry. This zone is cut by numerous quartz stringers up to 2 inches wide containing pyrite, molybdenite, and chalcopyrite. The porphyry up to an inch on either side of the quartz stringers is altered to a light pink colour. Several encouraging assays from the quartz stringers in the trench have been reported. Two grab samples submitted for assay by the writer assayed 0.16 oz. and 0.25 oz.

of gold per ton. A 50-foot drill hole, which parallels the trench a short distance west, is reported to have intersected four zones of mineralized quartz stringers. These assayed from 0.12 oz. to 0.20 oz. of gold per ton over 5-foot widths. An attempt was made to extend this zone to the north of the trench by diamond drilling. The programme was not successful. Apparently, the mineralized zones strike in a general east-west direction, but information obtained from surface exposures was not sufficient to verify this, nor could the dip be determined.