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PRELIMINARY REPORT

**NORTH HALF OF BOUSQUET
TOWNSHIP, QUEBEC**

BY

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INTRODUCTION

Recent developments at such properties as Cassels-Duval, Westwood Cadillac and Thompson Bousquet have stimulated interest in the mineral possibilities of Bousquet Township. This report and the accompanying map have been prepared to meet the resulting increased demand for geological information and are based on field work done in 1937. The map is subject to revision, particularly at the western end where various obscure structural problems are to receive additional study in 1938. The writer was ably assisted in the field by J.C. Coulson. Grateful acknowledgement is made for information received from those connected with mining in the area, and particular thanks are due Mr. D.M. Giachino for many details of the several properties with which he is familiar.

GENERAL GEOLOGY

Lithological subdivisions similar to those of Map 399A, Cadillac Area, have been adopted for the map. The strata strike east-west to northwest and only in a few places dip less steeply than 70 degrees. A notable exception is an area, along the north shore of the western part of Bousquet Lake, that is underlain by gently-dipping, carbonated, schistose sediments. A regional schistosity approximately parallel to the strike is moderately well developed except in the larger masses of greenstone. Fissile schists are restricted to zones that also conform approximately with the strike of the strata.

The descriptions of the volcanic rocks of the Cadillac area as given in Memoir 206 apply equally well to those of Bousquet Township with certain exceptions. The Cadillac belt, the southern band of greenstone in the eastern half of the township, changes as it continues westward towards Bousquet River. Near the eastern boundary of the township, on either side of the highway, it consists largely of green agglomerate and porphyritic andesite with only a little pillowed andesite and a few diorite intrusions. The agglomerate forms the southern part of the belt and continues westward at least as far as the Sudbury Contact property west of Norman Lake. Porphyritic andesite 400 to 500 feet thick continues half way across the Brown Bousquet claims but must thin rapidly west of that, although it may continue beneath drift at least as far as Norman Lake. It

lies north of the agglomerate and is bordered on the north by up to 250 feet of pillowed andesite. The schists and schistose conglomerate of map-unit 5 may be the westerly continuation of the northern part of the Cadillac belt from Cadillac Township or possibly they are merely a phase of the Cadillac sediments (Map unit 7). Only meagre data from a few small exposures and a number of drill holes are available concerning these rocks and the associated sodic intrusives. They are shown as a separate unit on the map largely because the conglomerate is different from other conglomerates in the area, contains a large proportion of green pebbles and in some places resembles agglomerate. The extreme schistosity is no doubt due to movements along the adjoining Cadillac "break". West of the Sudbury Contact property the Cadillac belt thins between sediments to the north and south, and finally apparently changes rapidly to, or wedges out between, siliceous tuffs and sediments that could not be satisfactorily separated from greywacke to the north and south. However, a reappearance of volcanic rocks along the strike is indicated by two small exposures of greenstone on the Calder Bousquet property. Because of lack of exposures the western half mile of the Cadillac belt in Cadillac township could not be accurately defined on Map 399A. Furthermore, recent drilling has shown that the belt is displaced southward on the western end of the Thompson Cadillac property, probably by a fault. These facts account for the lack of agreement of the contacts on the two maps.

The three adjoining volcanic formations that cross the Cadillac township line over a mile south of Kewagama Lake are the westerly continuation of the Blake River volcanics. Accordingly, all the volcanic rocks in the northern part of the western half of the map-area belong to the Blake River group. In the eastern half of the township the southern member (4) of this assemblage consists of a northern part that is largely chloritic, sericitic or carbonated tuff, slatey to schistose, and a southern part that is chiefly rhyolite breccia and associated acidic flows. West of the middle of the township tuffs and sericite schists predominate and there is an intermingling of sediments and volcanics on the south that causes great difficulty in establishing any definite contact there. Porphyritic rhyolite occurs in the Blake River volcanics principally as a narrow band, that for lack of outcrops could not be defined immediately west of the intrusive bodies at the middle of the township, and under a large area near Joanne township. It may be that rhyolite continues under drift across the Vaughan property west of the quartz diorite intrusive; the map is very definitely subject to revision in this particular locality.

The significance and importance of the greenstone belt in the extreme southwestern part of the area is not as yet apparent. A few small exposures of it are seen along the railroad and the township centre line. Andesite, diorite and amphibolite and a few small intrusions of feldspar were identified.

The sedimentary rocks of the area are also similar to those of Cadillac township. The northeastern band of greywacke is the westerly continuation of the Kowagama sediments; the greywacke underlying the extreme southern part of the area is a western prolongation of the Fournière sediments. In Bousquet township these rocks are fine-grained, argillaceous, arenaceous or arkosic, and altered in varying degree to mica schist and amphibolite.

The central sedimentary band, designated 7 on the map, corresponds to the Cadillac sediments and is chiefly greywacke. There are a number of lenticular beds of conglomerate in the southern part of the group; and there are interbeds of siliceous tuff along the north and south edges, in greater abundance on the north than the south. Iron formation, chiefly magnetite, is exposed at intervals in the central and northern parts of the group all across the township. The greywacke is intruded by diorite and, in the northeastern corner of the Brown Cadillac property and at a few other places to the west, it is extensively amphibolitized.

A few comparatively large intrusive bodies cut the stratified rocks. The largest, $1\frac{1}{2}$ miles by $1\frac{1}{3}$ mile, crosses the centre line of the township at Mooshla Mines. It is a massive, holocrystalline rock with random bluish quartz "eyes" set in a medium grained, greenish grey base. Quartz diorite is the most appropriate name but certain phases closely resemble the so-called granodiorites of northwestern Quebec. Contact phases are dense, grey to white, and, in many places, are speckled by quartz phenocrysts. Adjoining the quartz diorite on the south is a younger, smaller body of alaskite. This is a siliceous, dark grey rock that weathers pale grey to white and much of it is slightly schistose. It consists essentially of quartz and albite, the latter predominating, and is therefore similar in composition to the quartz albitites of Cadillac. Accessory minerals are present in very minor amount and the grain size throughout is uniformly fine, averaging between one and two millimetres, in spite of the very considerable size of the body. There are a few exposures of a body of granite at the mouth of Bousquet River and a few dykes of the same rock in the extreme northeast part of the area. Granite

and quartz porphyry occur, probably as two small bodies, on and south of the highway in western Bousquet. Several lenticular dykes of quartz albitite and albite porphyry have been cut by drill-holes in and north of the Cadillac "break" at Bouscadillac and Brown Bousquet. The youngest rocks in the area are dykes of quartz gabbro.

STRUCTURE

The sedimentary and volcanic rocks have been isoclinally folded so that they now are nearly vertical. Across the southern part of the area they strike persistently nearly due east and west but in the northern part the trend swings to the northwest. After the folding, and the shearing and faulting that accompanied it, the acidic intrusives were injected. Subsequent stresses produced additional shearing for the intrusives are locally schistose. Finally the rocks were broken by transverse faults similar to those of Cadillac township. The majority of these faults have very small displacements; a few of the major known ones are shown on the map. They preceded the injection of the quartz gabbro dykes.

Faults and Shear Zones

The Cadillac "break" is one of the most important structural features of the area. It is a nearly vertical, major shear zone along which the rocks are converted to soft, talcose mica and chlorite schists. For 25 miles east of Bousquet township the many important gold deposits are closely related to it. In 1937 the shear zone was traced for nearly nine miles across Bousquet township, to within a little over a mile of the west boundary. Nowhere in this distance is it exposed at the surface but it has been cut in drill holes at Bouscadillac, Brown Bousquet, Sudbury Contact Doreva, Norgold and Calder Bousquet in locations that leave little or no doubt of its continuity as a remarkably straight zone. The indicated width of soft schist and associated gouge-filled seams varies from about 50 to 200 feet in most places but is reported to be much wider than this in old drill holes beneath the low ground north of the Bouscadillac shaft. There is as yet no direct evidence of the course followed by the shear zone west of the area that has been drilled at Calder Bousquet shaft. Its possible position beyond there for nearly 3,000 feet is indicated on the accompanying map. At the end of this stretch, one claim from the extreme west end of the Calder Bousquet group, there are a number of old trenches and exposures just south of a narrow, swampy depression. The exposed greywacke is schistose and highly contorted and there are a number of irregular,

sulphide-bearing, quartz veins in which some gold has been found. A long trench near the west end of the high ground exposes a quartz vein striking northeast-southwest, an unusual trend in this area. To the west as far as Joanne township there are only two or three small outcrops in low ground. To the writer these facts suggest that instead of continuing nearly due west as might be expected, the Cadillac "break" may bend sharply southward at this place, along an S-shaped course. Beyond the bend it may continue westward somewhere near the north contact of the thick conglomerate formation lying just north of Bousquet Lake. Until further information is obtained near the west end of the Calder Bousquet group it seems impossible to predict where the westerly continuation of the shear zone lies, so the two possibilities outlined above should be borne in mind. The main conglomerate formation swings south from Calder Bousquet to outcrop along the north shore of Bousquet Lake for over a mile and from there continues west between the highway and the lake. Where the conglomerate borders the lake the whole formation is intensely carbonated and schistose; the alteration dies out gradually to the east and west along the strike. Within the altered area the schistosity, and presumably the bedding, dips 20 to about 50 degrees north, in sharp distinction to the nearly vertical and comparatively unaltered gneiss to the north and south. Detailed mapping within the altered zone has revealed a number of sharp drag folds and much complicated contortion, indicating that the structure is much more complex than the accompanying map indicates. In addition, a fault of major importance and unknown displacement follows the south contact of the conglomerate for at least 1,500 feet northeast from the lake. Where exposed on the lakeshore the fault-plane dips steeply south. Mr. C.W. Knight advises that drill holes put down several years ago indicate that a strong fault underlies the lake near the north shore. The writer has not yet been able to ascertain whether the fault continues beneath the lake to its west end or whether it swings north out of the lake in conformity with the conglomerate. This fault, the disturbance and intense carbonatization of the conglomerate, and the course followed by the western projection of the Cadillac "break" are parts of a major structural problem that merits further investigation by those interested in the mineral possibilities of the region.

Further light may be thrown on the problem by conditions in the northwest corner of the township, where field work is not yet completed. Preliminary observations show that porphyritic rhyolite and greenstone some 4,000 feet thick extend a mile and a half east into Bousquet township and in effect displace the north

contact of the Cadillac sediments over half a mile south at the west end of the area. It is not apparent whether the displacement is caused by folding or faulting, or merely by discontinuity of the lithological units along their strike. The latter explanation would necessitate assuming the existence of something approaching a major unconformity and as yet no evidence of such has been found in the area. Furthermore, it is worthy of note that the southward displacement of the north contact of the sediments lies directly north of the disturbed area at Bousquet Lake. The terrain between the two localities is so largely drift covered that only a very fragmentary idea of the geology can be obtained. It has not been proved, therefore, whether or not a north-south zone of faulting or drag folding connects the two localities.

Rocks in a broad zone across the northern part of the area, including the northern half to two-thirds of unit 4 on the map and some of the adjoining strata on the north, are more highly schistose than usual. The lavas and predominant tuffs of this zone have been converted to chloritic and sericitic schists and phyllites and in the western part of the township are for the most part carbonated. The well developed schistosity parallels the strike of the strata and is not due to faulting but merely indicates that the rocks of the schistose zone were less competent than the more massive lavas and sediments to the north and south. The shearing has been much less intense than that which occurred along the Cadillac "break" to the south.

There are many transverse faults of minor displacement. A few are represented on the map; many others with displacements of a few inches to a few feet were observed during the summer. All cut sharply across the strike of the strata and can be classified in two groups; those striking north to northwest have right-hand offsets and those striking in the northeast quadrant have left-hand offsets. The economic significance of similar faults in Cadillac township is discussed at some length in Memoir 206.

MINERAL DEPOSITS

The entire area is staked and the bulk of it is covered by surveyed claims. Crossed by one of the main water routes of the region, Bousquet township has been visited by prospectors for over 25 years, and during the past 14 years several determined efforts have been made to develop mineral deposits. No great success has attended any of the efforts, however, and as yet there

is no producing mine in the area. But important discoveries have been made within the last year and the outlook at present is more hopeful than at any time in the past. All the deposits in the area are valuable primarily for their gold content.

The whole northern half of the township has been prospected with some care, but all of it is timbered and a large proportion is covered by deep drift.

The principal discoveries to date have been in two belts following the strike of the strata. The southern belt lies in close proximity to the Cadillac "break" and crosses the township from Bouscadillac to the west boundary between the highway and Bousquet Lake. The northern belt is $1\frac{1}{2}$ to $2\frac{1}{2}$ miles to the north in volcanic rocks; it is less clearly defined, but is the scene of the chief activities today.

Deposits Along the Cadillac "Break"

The gold deposits along this southern belt are similar to those of Cadillac township, that is they are, lenticular quartz veins and related carbonated or otherwise altered bodies of rock. Native gold is the valuable constituent and arsenopyrite, pyrite, and pyrrhotite are the principal sulphides. Chalcopyrite, sphalerite and galena are present in places. Besides quartz, the diagnostic gangue minerals are black tourmaline, ankeritic carbonate, sericite and biotite. The carbonates replace the country rock and are not abundant in the quartz veins.

Bouscadillac Gold Mines Ltd., operating the old Graham-Bousquet property, dewatered the old shaft and did additional underground work in 1937. The deposits are quartz veins and highly mineralized zones in porphyritic andesite near its north contact with greywacke. Re-sampling is reported to have shown a small tonnage of low-grade material in the old workings and a small shoot of high grade was found by new work in the western end of the mine. During the summer of 1937 a number of drill holes were put down across the same contact zone to the west of the mine. Interesting gold assays were obtained from 900 to 1,750 feet west of the shaft but the property was closed down in the autumn and no work has been done since.

Brown Bousquet Gold Mines Ltd. controls a group of claims immediately west of Bouscadillac. Quartz veins and sulphide zones occur on the property in greenstone and porphyritic andesite but are barren or low grade. In 1937 the company drilled

a section 1,750 feet long immediately north of the greenstone belt and west from the east boundary of the property. The holes cut greywacke and conglomerate, schists of Cadillac "break" and schistose conglomerate to the north as well as intrusions of quartz albitite and albite porphyry in the schistose rocks. A few mineralized zones and quartz veins were encountered and one intersection of free gold was obtained, but operations were suspended in the autumn.

The principal showing of Sudbury Contact Mines Ltd. is a quartz vein in greenstone. It has been followed in a stripping for 500 feet in a zone along which the greenstone and some intercalated graphitic sediments are sheared, carbonated, and mineralized. Pyrite and arsenopyrite are the associated sulphides and the mineralized zone varies in width from a few inches to a maximum of about 10 feet. A shallow prospect shaft was sunk on the vein several years ago. Late in 1937 a hole was drilled in the low ground to the north of the greenstone belt, north of the vein. It cut two pronounced zones of chlorite schist separated by 50 feet of greywacke and mica schist with 360 feet of greywacke and conglomerate between the southern shear zone and the greenstone to the south. The writer believes the shear zones are the main Cadillac "break". Several small veins and mineralized zones appeared in the core and some of these yielded low gold assays.

Doreva Gold Mines Ltd. in 1936 and 1937 developed claims immediately west of Sudbury Contact. After much drilling and surface work a shaft was sunk just north of a vein zone that is reported to have shown some spectacular free gold at the surface. At the 150-foot level the vein zone has been followed by a drift for 185 feet. It is a crushed and sheared zone from 5 to 15 feet wide in highly altered, siliceous greywacke or tuff at the south contact of a bed of conglomerate about 35 feet wide. The zone is cut by stringers, lenses and veins of bluish grey quartz and is in part heavily impregnated with arsenopyrite, pyrite and pyrrhotite. In a brief examination the writer found no free gold but the management has reported that substantial amounts were encountered during the drifting. No average assays have been announced. Some encouragement is also reported to have been obtained from other veins on the property. Operations were suspended in August due to financial difficulties. The shaft vein is south of the main Cadillac "break" and north of greenstone.

Narrow auriferous quartz veins in greywacke have been tested by trenches and limited underground workings by Norgold.

Mines Ltd., and on the adjoining Sagamore group to the east, now controlled by Doreva. They lie between the Cadillac "break" and a thick bed of conglomerate to the south. In 1937 Norgold Mines drilled one hole north of their veins to probe the "break" but encountered no mineralized material of importance. At the west side of the Norgold property a wide zone in the greywacke is carbonated and well mineralized with pyrite and arsenopyrite. It has been traced by trenches for 600 feet, mostly on Calder Bousquet ground to the west, and carries considerable quartz, but the gold content is reported as too low to justify further development. Further west, on Calder Bousquet ground, arsenopyrite-bearing quartz veins in a wide zone in contorted greywacke just south of the Cadillac "break", have been drilled and explored by a shaft with levels at 70 and 125 feet. While some very rich specimens have been taken from the workings, results on the whole must have been disappointing as no work was done in 1937 and the shaft is flooded.

In 1937 the only work done to the west of the Calder Bousquet property was on ground held by A. Paquin of Rouyn. Fifteen hundred feet north of the lake considerable stripping has been done on very irregular quartz veins in gently dipping and highly contorted conglomerate along the north edge of the highly carbonated area referred to in an earlier part of this report. Native gold is present and the best mineralization seems to be restricted to an intensely fractured drag fold on the edge of swampy ground that makes further surface development very difficult. Arsenopyrite, pyrite, chalcopyrite and ankerite accompany the quartz.

While the above examples serve to show that developments to date along the Cadillac belt in Bousquet township have not been as encouraging as might be wished it must be remembered that by far the largest percentage of the most favourable zone, in close proximity to the main "break", is obscured by deep overburden and has not been explored. If one may judge by Cadillac township any deposits are apt to be rich and correspondingly small so that much effort is required to find them. The fact that no sodic intrusives like those in Cadillac have been found along the belt west of Brown Bousquet might be considered as an unfavourable sign as these intrusives are believed to be genetically related to the Cadillac deposits and certainly occur all across that township. But knowledge of their significance is so incomplete that any conclusions based on their absence cannot be accepted with any great assurance.

The structural problem that exists in the western part of Bousquet township has already been discussed and some attention has been given to the possible westward continuation of the Cadillac "break" beyond Calder Bousquet. If the "break" were bent south as previously suggested it is interesting to note that it might pass quite close to and north of the auriferous Paquin deposit. This would leave east of that deposit a considerable area extending well into Calder ground that should have some economic possibilities and is still unexplored. Its location between the "lake" fault and the Cadillac "break", the unusually flat dip and at least local contortion and the intense carbonatization noted in the limited exposures add interest to the area, as do the small granitic intrusives that lie not far to the north. Beginning not far north of the lake most of the bedrock is deeply buried by clay.

Deposits in the Northern Part of the Township

Thompson Bousquet Gold Mines Ltd. has trenched and drilled a wide zone in slaty chlorite tuff and grey sericite schist in the southern member of the Blake River volcanics. The tuffs, with which are associated thin amygdaloidal flows, are carbonated and much fractured, and across widths of 60 feet and more are impregnated and veined by pyrite. Very little quartz has been introduced and the margins of the mineralized zone are poorly defined. Late in September 1937 the pyritic zone had been traced 800 feet and the company reported that fairly consistent low gold assays had been obtained from a number of trenches across it. The writer took two chip samples, each across a width of ten feet of material more highly pyritic than the average exposed and they assayed respectively 0.56 and 0.12 ounce in gold a ton. A company official informed the writer in May that trenching and drilling has defined a body 1,300 feet long and 60 feet wide that average \$3.05 a ton and \$2.50 a ton if some erratic high assays are reduced; also that much better assays have been obtained across narrower sections in and south of the main zone. One narrow, carbonated pyritic zone on the south contains small veins of sphalerite and is also auriferous.

Westwood Cadillac Mines Ltd. is developing deposits 4,500 feet west along the strike of the strata from Thompson Bousquet. The intervening ground is largely drift-covered. The workings are a short distance south of the rapids in Bousquet River. A southern zone in tuffs and sericite schist is replaced by carbonate and pyrite and veined by sphalerite. As intensive surface work gave disappointing results development work was then concentrated on a zone 250 feet to the north. It is at the south

side of low ground. The mineralization consists of very irregular quartz veins and some narrow zones of carbonate and pyrite in schistose tuff and amygdaloid. The quartz occurs as veins and branching masses up to 7 feet wide accompanied by black tourmaline, coarse pyrite and a little chalcopyrite in a zone that in one trench is at least 24 feet wide. There is apparently no one continuous vein but the broad zone can be followed on the surface for about 60 feet. It may continue west under drift. Assays obtained at the surface led to several thousand feet of diamond drilling and one hole showed much free gold across a width of $2\frac{1}{2}$ feet. During the winter a shaft was sunk to 200 feet. Recent reports state that rich ore has been found in a drift.

O'Loary Malartic Mines controls a group of claims west of Westwood Cadillac. The south discovery is a carbonated pyritic zone in quartz-sericite schist and chlorite schist. The zone varies in width up to about 25 feet and has been found at intervals for 3,000 feet. It is veined by quartz and tourmaline and well mineralized with pyrite and minor amounts of chalcopyrite and sphalerite. Company assay plans show erratic but interesting gold content in one section 380 feet long that has been well exposed in trenches. Toward the west end of the property garnet appears in some abundance along the mineralized zone. The north discovery is 1,500 feet north of the south in the extreme northwest corner of the property. It is a narrow zone, from a few inches to three feet wide, in sericitic schist and porphyritic andesite, and is mineralized with pyrite, chalcopyrite, quartz and some tourmaline. It has been troned for 240 feet. Systematic sampling by the company is reported to have shown rather erratic gold assays ranging from a trace to over \$100 per ton.

The deposits on the three properties described above lie in a group of schistose tuffs and lavas that constitute the northern half to two-thirds of the southern member of the Blake River volcanics. Between the known deposits and also to the west and east along the strike, the same rocks, similarly sheared, are known to continue but are almost entirely drift-covered. There is therefore much ground in this broad zone as yet unexplored and favourable to the occurrence of similar deposits.

North of Bousquet Rapids, on ground held by E.J. Thompson et al., recent discoveries are reported to have yielded interesting gold assays. A number of trenches at wide intervals in andesite and tuff near the north contact of the Blake River volcanics have shown widths of up to ten feet of quartz, tourmaline and wall rock mineralized with pyrite, pyrrhotite and some chalcopyrite.

A second showing is 3,000 feet south in sheared porphyritic andesite. It is a pyritic replacement zone with associated quartz, carbonate, pyrrhotite, magnetite and tremolite and varies in width from a mere seam to a maximum of about 18 inches.

Mooshla Gold Mines Co., Ltd. owns a large block of ground on either side of the township centre line. The principal vein is west of the centre line and is developed to 350 feet by a shaft that is now flooded. It occupies a fissure in alaskite (locally called aplite) and consists of massive sulphides or quartz and sulphides seldom over three inches wide and averaging much less than that. There are minor amounts of chalcopyrite, sphalerite, and galena with the predominant pyrite and pyrrhotite. There is garnet in specimens from the bottom level. Native gold is present, occasionally in spectacular amount, and the massive sulphides are very rich. The developed length underground is reported as about 75 feet and the vein stops on the south against a large dyke of gabbro. A second vein of quartz and sparse sulphides lies half a mile northwest in quartz diorite and in the past has been developed by trenches and a prospect shaft. Several other veins of less importance have been found on the property, one in alaskite southeast of the shaft and others in schists to the southwest.

Vaughan claims and part of the Cassels Duval holdings north of Mooshla were optioned by United States Smelting Refining and Mining Company late in 1937. Drilling and trenching by Cassels Duval had proven a number of narrow veins of quartz and sulphides in greenstone. The sulphides include pyrite, pyrrhotite and chalcopyrite and some native gold has been found. Assays of commercial value have been obtained across widths of 2 to 5 feet for 300 feet along a zone of these narrow veins that strikes N.80°W. A much larger mineralized body of greenstone has been found a short distance southwest. Trenching and drilling done during the winter of 1937-38 indicate a body 20 to 75 feet wide and over 300 feet long and the gold content is reported to range from \$3 to \$6 a ton. There are smaller bodies of higher grade within the main mass. The type of mineralization is said to be similar to that of the north showing: veins and disseminations of quartz and sulphides throughout fairly massive to intensely fractured greenstone. The deposits lie about 1,000 feet north of the contact of the quartz diorite stock referred to on a previous page.

Other Deposits in the Area

Many veins of lesser importance than those thus far referred to have been found in the area. The massive greywacke underlying most of the central part seems quite unfavourable except where the thicker bands of iron formation occur. These brittle members fracture readily and in several places have been found to be well mineralized with quartz and pyrite or arsenopyrite. Greywacke along the southern part of the area also seems to be of little promise in spite of an abundance of quartz veins. Little of encouragement was noted in a large area of massive greenstone north and west of Cassels Duval. The area underlain by rhyolite porphyry and greenstone alongside Joanne township has not yet been studied in detail by the writer. Limited development work has been done there on quartz veins in the past.