

RP 475(A)

PRELIMINARY REPORT ON COLLET - LABERGE AREA, ABITIBI-WEST COUNTY

Documents complémentaires

Additional Files



Licence



Licence

Cette première page a été ajoutée
au document et ne fait pas partie du
rapport tel que soumis par les auteurs.

Énergie et Ressources
naturelles

Québec 

PROVINCE OF QUEBEC, CANADA

DEPARTMENT OF NATURAL RESOURCES

HONOURABLE RENÉ LÉVESQUE, MINISTER

P.-E. AUGER, DEPUTY MINISTER

EOLOGICAL SURVEYS BRANCH

H. W. MCGERRIGLE, CHIEF

PRELIMINARY REPORT

ON

COLLET-LABERGE AREA

ABITIBI-WEST COUNTY

BY

RAYMOND DAVIES



QUEBEC
1962

Preliminary Report
on
COLLET-LABERGE AREA
ABITIBI-WEST COUNTY

by

Raymond Davies

INTRODUCTION

The Collet-Laberge area, mapped during the summer of 1961, is bounded by latitudes $49^{\circ}15'$ and $49^{\circ}30'$ and by longitude $79^{\circ}00'$ on the east and the Quebec-Ontario boundary (longitude $79^{\circ}31'$) on the west. It comprises an area of approximately 400 square miles, and includes all of Collet and Laberge townships and portions of Boivin, Paradis, Lemaire, Brabazon, Estrées, Casa-Berardi, and Dieppe townships.

T.L. Tanton (1919) mapped the Harricana-Turgeon Basin, of which the Collet-Laberge area is a part, at 4 miles to 1 inch. R. Thomson (1936) made a reconnaissance geological survey of the adjacent Burntbush River area to the west in Ontario. The Perron-Rousseau area to the south was mapped at 1 mile to 1 inch by Flaherty (1939), and the Mistawak Lake area to the east and southeast at 2 miles to 1 inch by J.T. Wilson (1938). The area to the north was mapped by J.H. Remick in 1959 (MSS.).

The southern boundary of the area is 31 miles to the north of La Sarre, a town on the Canadian National Railways. From La Sarre good roads go as far north as Val Paradis, from where winter roads, used by the lumber companies, serve the southern half of the area. A bombardier snowmobile, hired locally, was found to be the most reliable and economical means of transport on the winter roads. A fairly well-kept road between the Audet saw-mills and the Audet lumber camp is suited to farm tractors, and, in dry weather, to four-wheel-drive vehicles. This road is being extended, for winter use only, well into the north.

Turgeon river affords access to the west and northwest parts of the area. From Val Paradis via Boivin river little difficulty was experienced in reaching the confluence of Turgeon and Burntbush rivers in the northwest corner, in spite of a fairly dry summer. Only five portages were necessary, the longest being roughly 1,000 feet. All are in good condition. John creek, a

tributary of the Turgeon, and Ménard river to the southeast, a tributary of the Wawagosik, are suitable for canoes only during periods of heavy rain, owing to windfalls and rapids.

The least accessible northern and northeastern portions were covered with the use of a helicopter. However, the northeast corner may be reached by canoe via Wawagosik river.

Surveyed township lines are generally overgrown but can be followed in most cases. The Quebec-Ontario border line is easily followed.

PHYSICAL FEATURES

The land surface is generally flat. However, along the southern portion of the area rounded hills of granite rise a few hundred feet above the surrounding country. This part of the area offers the greatest exposure of rock. It is thickly wooded, with relatively small areas of swamp. Towards the north the swamps increase in number and in size, covering up to 60% of the surface in the northeast. In the northwest corner massive lavas form prominent hills. A southwest-trending diabase dyke has given rise to an intermittent ridge across the southeast corner of Laberge township. The dyke continues across the northwest corner of Paradis township in the granite area, but, although still more resistant, is not as marked. The lavas in the southern half of Laberge township form only small ridges.

Trending in a N.30°W. direction across Paradis and Laberge townships is a prominent esker-like ridge partly buried by an outwash deposit. The latter is marked by a line of small kettle lakes. Other glacial features are kames and sand and gravel ridges trending N.30°W.

Drainage is by way of Turgeon river and its tributaries via the Harricana northward into James bay. The four major tributaries - Corset, Théo and Ménard rivers and John creek - rise along the northwest-trending outwash deposit. The last forms a divide between Ménard and Théo rivers on the one hand and John creek and Corset river on the other. The general trend of the larger streams is southeast, roughly parallel to the movement of the ice.

The river valleys in the southern half of the area are fairly deep and narrow, and have cut through the glacial overburden in places along John creek and Turgeon and Ménard rivers to expose bedrock or boulder deposits. That the bedrock itself has been little affected by river erosion is shown by numerous examples of well-preserved glacial striations on outcrops in the Turgeon River bed.

Lakes in the area are relatively few and small. Apart from the kettle lakes, a number of small lakes enclosed by

swamp are scattered over the northern half of the area.

GENERAL GEOLOGY

All the consolidated rocks are considered Precambrian in age, though diabase dykes and other small intrusions may be younger. Roughly 50% of the area is underlain by granites and related rocks. Four distinct types are recognized. They cover the whole of the southern quarter of the area as well as the west half of Brabazon and much of Laberge township. Small outcrops also occur on Turgeon river in the west. The north, northwest, west and central parts of the area are underlain by lavas, hornblende schist and metasedimentary rocks. Diabase dykes occur in the southern quarter of the area and in the southeast quarter of Laberge township.

Table of Formations

Pleistocene and Recent	Boulders, gravel, sand, silt and clay
Unconformity	
Precambrian	Diabase
	Intrusive Contact
	Pegmatite, aplite. Pink biotite granite
	Intrusive Contact
	Pink gneissic biotite granite
	Grey biotite granite and gneissic granite
	Pegmatite, granite dykes Lamprophyres Pink hornblende granodiorite Hornblende granite, granodiorite, quartz-diorite and diorite, mainly gneissic
	Intrusive Contact
	Metasedimentary rocks: hornblende, chlorite, mica and talc schists Metavolcanic rocks: andesite, basalt, volcanic agglomerate, chert

Unconsolidated gravels, sand, silt, and clay of Pleistocene or Recent age cover the greater part of the area.

Contacts were rarely seen, and in most cases the geological boundaries are assumed. Almost invariably outcrops could be spotted on the aerial photographs ($\frac{1}{2}$ mile = 1 inch).

Metamorphosed Volcanic and Sedimentary Rocks

Metamorphosed volcanic and sedimentary rocks occur in the west, northwest, north, and central parts, amounting to 50% of the area. Unfortunately for such a large area, the exposure is sparse. Outcrops are found as small hills or ridges near Audet camp and in the southeast near the Le Roux road, also on Turgeon river in the west, and in hills along the northern boundary.

Dark greenish-black, fine-grained hornblende schists occur in the south near the granite contact. They consist of hornblende needles aligned parallel to the schistosity, together with feldspar and quartz grains. Epidote is present in many places.

Paper-thin banding, resulting from metamorphic differentiation of the hornblende and light-coloured minerals into separate layers, is common. Where there has been later injection of quartz and feldspar, the bands of alternating dark and light material are up to $\frac{1}{2}$ inch wide. There is also compositional banding on a slightly larger scale. This is best seen on the weathered surface.

The weathered surface is rough owing to differential weathering, the quartz, feldspar, and epidote-rich bands being the more resistant. It is normally greenish-black, but is grey where rich in feldspar. Epidote bands are light green. Sulphides, where present, give the surface a rusty brown appearance. The feldspar-rich bands are commonly powdery and light-coloured to a depth of 1 or 2 inches.

Interlayered with the schists in places are medium- to coarse-grained amphibolites. There is usually a gradation from the one to the other. Hornblende crystals vary in length up to $\frac{1}{2}$ inch, and may constitute as much as 90% of the rock.

Farther from the granite contact recrystallization has been less intense. Pillow structures have been preserved in the neighbourhood of Audet camp. These pillows have a dark, fine-grained rim enclosing a coarser-grained and lighter-coloured interior. Amygdules can be seen around the edge of the latter. The pillows vary in size from a few inches across to several feet. Individual flows, in part amygdaloidal, can be recognized, and in one outcrop volcanic agglomerate is present. However, these rocks have been highly deformed and are schistose, sometimes showing a pronounced lineation of the hornblende needles. The amygdules have been elongated into long narrow streaks parallel to the lineation.

A dark green, medium- to fine-grained, dense, pyroxene-garnet rock was found in the lavas, one mile south of Audet camp. The rock is rusty-brown on fractures, sheer planes, and the weathered surface.

On Turgeon river in the southwest, a massive, medium-grained, silvery-grey, chlorite rock is associated with a fine-grained mica schist and a fine-grained, quartz-sericite rock. The outcrop is poorly exposed but appears to be cut by granite.

Outcrops along the northern boundary of the area are mainly massive, fine-grained, greyish green andesites. The mafic minerals generally have been altered to chlorite, though some outcrops show dark green hornblende crystals 1/8 to 1/4 inch long in a fine chloritized groundmass. Schistose varieties, including a light-brown talcose schist, occur to the east.

Greenish-grey chert occurs as much deformed bands or lenses in the andesite in places. Epidote is abundant in some outcrops. Quartz veins are fairly widespread.

A massive and rarely pillowed, fine-grained, mauve, basaltic lava, apparently interlayered with the andesites, is exposed over a limited area.

The weathered surface of the massive lavas is rusty-brown and fairly smooth, the weathered layer being $\frac{1}{4}$ inch thick. In the schistose varieties, the surface is a little rough and a paler brown, and the weathering is deeper.

Inclusions of the volcanic rocks occur in all the adjoining intrusive rocks to the south. They vary from a few inches across to several hundreds of feet, and are in various stages of recrystallization and alteration. Particularly large masses of hornblende schist occur in the pink, biotite, gneissic granite in the southeast.

Hornblende Granite-diorite Complex

The hornblende granite-diorite complex is the best exposed geological unit in the area. It trends east across the southern quarter of the area, south of the greenstone belt. A small outcrop also occurs in the east of Laberge township just north of Le Roux camp. Outcrops form rounded hills projecting a few tens to a few hundreds of feet through glacial overburden.

The complex varies considerably in composition, although the presence of hornblende as the most common mafic constituent is the distinguishing feature. No attempt has been made to separate the various rock types. Much of the outcrop consists of medium-grained, white to dark grey, gneissic, hornblende granite, granodiorite, quartz diorite and diorite, but more basic rock types are common. The major constituent minerals are varying proportions of hornblende, feldspar, and quartz. The hornblende

content may amount to as much as 70% in places. Accessories are chlorite, apatite, enidote, biotite, pyrite, and magnetite.

Hornblende commonly occurs in prismatic grains, generally $\frac{1}{4}$ inch but, in coarser-grained varieties, up to 1 inch in length. It is dark green and shows alteration to chlorite.

The feldspars are white to grey and for the most part fresh. Polysynthetic twinning is easily seen in the larger grains of the plagioclase feldspars.

Quartz is glassy and commonly bluish, the blue colour being characteristic of the complex. Small amounts are present in even the most basic types.

The weathered surface varies with the composition, but is generally rough. In acid varieties it is grey or white with the resistant quartz projecting above the surface. Blue quartz may give the surface a bluish tint. More basic varieties are mottled black and white, with the resistant hornblende standing out and giving it a rough, greenish, carpet-like surface in many places.

Gneissic structure is prominent, owing to the alignment of prismatic grains of hornblende and also to the alignment of elongated lenses of quartz in more acid varieties. Dips are generally steep or vertical. Lination is not pronounced.

Intimately associated with the hornblende varieties east of Turgeon river is a fine-grained, grey-brown, gneissic, pyroxene, feldspar rock. It consists of pyroxene 10-20%, quartz 1-3%, and well twinned plagioclase. Disseminated magnetite is accessory. The fresh surface is grey-brown and sugary in appearance, while the weathered surface is light grey and rough. Alignment of the pyroxene grains is only noticeable on the weathered surface.

Rough layering of the different rock types is evident east of Turgeon river, and there is gradation across the strike of the gneissosity from one rock type to another. However, the changes may be quite sharp in places. One variety may predominate over a great thickness, or the bands may alternate closely.

The acid varieties appear to have been more mobile west of Turgeon river, in the southeast on the southern boundary, and near the greenstone contact on Le Roux road. In places the gneissosity is less marked and the rocks coarse grained. Inclusions or undigested remnants of medium- to fine-grained diorite; of fine-grained, gneissic, hornblende-feldspar rock containing 40-50% hornblende and plagioclase; and, in a few places, of hornblende schist, are cut by the coarser-grained granites and diorites. Patches of light coloured, finely banded, gneissic material have been almost completely absorbed. Their presence is indicated by the alignment of ferromagnesian minerals. Probably representing

more basic inclusions are large masses of medium- to coarse-grained, fairly massive, hornblende rock containing from 50-90% hornblende with plagioclase and a little blue quartz. A few contacts, generally sharp, show granite cutting the hornblende rock.

The inclusions can be matched in most cases with the more highly metamorphosed rock of the greenstone belt to the north.

The complex continues across the northeast corner of the Perron-Rousseau area to the south and corresponds to the granites and gneisses marked 3a on Flaherty's map (1939).

Pink hornblende granodiorites occur in the west on Turgeon river and in the southwest, associated in both places with the hornblende granite-diorite complex.

The Turgeon River occurrence is medium grained, massive, and mottled pinkish green. It consists of hornblende (5-10%), pinkish grey feldspar, and quartz. Closely associated is a similar-appearing pink hornblende granite, rich in quartz.

The occurrence in the southwest is massive and coarser grained. Its relation to the surrounding rocks was not determined.

Grey Biotite Granite

Grey biotite granite occurs in the east underlying much of Brabazon township and the eastern part of Laberge. It also occurs on Turgeon river in the west and southwest.

It is generally a homogeneous, medium-grained, white to grey biotite granite or gneissic granite consisting essentially of biotite (3-10%), glassy white quartz (20-30%), and feldspars. Accessory minerals are epidote, apatite, magnetite, chlorite, and muscovite. In places it is coarse grained with very marked alignment of the biotite flakes.

Biotite is the characteristic mafic mineral and this, together with the colour, distinguishes it from the other granites. The biotite is dark brown to black and occurs as flakes or small books 1/8 to 1/3 inch in diameter. Chlorite is associated with the biotite in many places.

Feldspars are of both sodic plagioclase and potash varieties. The former are white to grey-white and show polysynthetic twinning; the latter are in slightly pinkish or greenish untwinned grains.

The weathered surface is white to grey and relatively smooth; although removal of the weathered biotite leaves it pitted. The coarse-grained varieties are darker and moderately rough.

Foliation is easily recognized on Turgeon river and in Laberge township, but is poor to absent in Brabazon township.

On Turgeon river the contact of the granite with the greenstones is well exposed. Huge angular blocks of hornblende schists and amphibolites are enclosed by granite with sharp contacts. Schistosity of the different blocks is relatively constant, indicating little rotation of the blocks.

Small inclusions, from a few inches to a few feet across, may be angular or rounded. The rounded ones are usually lighter in colour and are in the process of being replaced. Patches in the granite showing marked alignment of ferromagnesian minerals are all that remain of some inclusions. Injection gneisses showing ptigmatic folding are well exposed.

At the first rapid on the Turgeon, a little biotite granite occurs with the rocks of the hornblende granite-diorite complex. Cutting relations were not observed, but the homogeneity and freshness of the biotite granite suggest that it is younger.

Pink Biotite Granite

Pink granites occur in the southeast corner of the area. Flaherty (1939) mentions pink granites in the adjoining portion of the Perron-Rousseau area to the south, and Wilson (1938) found them along the adjoining edge of the Mistawak Lake area to the east.

Two varieties are recognized. A coarse-grained, massive variety occurring along the extreme southeast boundary cuts a medium- to fine-grained variety to the north of it.

A) Coarse-grained pink granite

The rock is a coarse-grained, massive, pink, biotite granite, consisting essentially of quartz 15-25%, biotite 5%, with potash and plagioclase feldspars. Muscovite may make up as much as 5% of some of the rock. Chlorite occurs as an alteration product of the biotite in places. Accessories are epidote, magnetite and pyrite. The rock is distinguished by its massive character, large grain size, and colour.

Feldspars are pink to pinkish white and occur as well-formed crystals up to 1 inch long with smaller, less well-developed grains in the surrounding groundmass. Twinning can be seen in some crystals.

Black biotite occurs as small flakes, generally about 1/8 inch in diameter. The quartz is glassy and much of it is stained red.

The weathered surface is white to pinkish and fairly rough owing mainly to the large grain size, and also to the resistant quartz.

B) Pink gneissic granite

The rock is a medium- to fine-grained, pink, gneissic, biotite granite, consisting of quartz 10-20%, biotite 1-10%, with plagioclase and potassic feldspars. Muscovite may be fairly abundant in some rocks. The biotite is often altered to chlorite. Accessories are epidote, apatite, pyrite, and magnetite. A soft, pinkish-white, powdery weathered surface, resulting from the alteration of the feldspars, is characteristic.

A porphyritic variety is fairly common, with feldspar crystals up to 3/4 inch long elongated parallel to the foliation in a finer-grained groundmass.

To the northwest, the rock becomes pinkish-grey. Its relation to the nearby medium-grained, grey, biotite granite was not determined.

Foliation is prominent in some rocks but difficult to determine in others. Generally it strikes north to northwest.

Hornblende schist occurs in a number of places as inclusions varying in size from a few feet across to large bodies. They have not been recrystallized to the same degree as have the inclusions in the other intrusive rocks.

Dykes of pink granite were seen cutting the rocks of the hornblende granite-diorite complex in several places. The dykes are medium- to fine-grained in general, but some have coarse-grained pegmatitic cores. Similar dykes cut the larger masses of hornblende schist, in many cases striking parallel to the schistosity.

Pegmatites

No large bodies of pegmatites were observed. Small dykes, usually no more than a few feet wide, occur throughout the granite areas. They consist of potash feldspar, quartz and, locally, a little biotite. A few narrow dykes in the hornblende granite-diorite complex contain hornblende crystals up to 1 1/2 inches long.

Numerous fine-grained, pink aplites were noted in the southwest corner of the area.

Basic Intrusive Rocks

Lamprophyres

Several medium-grained, dark greenish-black dykes, from a few inches to 15 feet wide and consisting of biotite, hornblende and chlorite, occur in the southwest. The weathered surface is dark greenish-black and rough due to small flakes and books of resistant biotite.

These dykes cut the rocks of the hornblende granite-diorite complex, and are themselves cut by thin quartz-feldspar veins, and possibly by the biotite granite.

Small inclusions of granite, diorite and aplite, all within a few feet of one another, were observed in one occurrence.

Diabase

A large diabase dyke, 100 to 200 feet wide, strikes southwest across the southeast part of Laberge township, and continues southwesterly into Paradis township. Being more resistant to erosion than the country rock, it forms a prominent intermittent ridge in relatively flat ground. The rock is fresh, massive and medium to coarse grained and consists of pyroxene (30-40%), plagioclase laths, and minor amounts of epidote, pyrite and magnetite. It shows good diabasic texture. The weathered surface is a light rusty brown with white flecks of decomposed feldspar. Joint blocks as well as the outcrop as a whole have been rounded by exfoliation.

A fine-grained, black chill zone occurs at the contacts with the country rock. This zone may be several feet wide, after which the grain size increases rapidly towards the centre of the dyke. Enrichment of epidote in the country rock and alteration of the mafic constituents were seen in a number of places along the contact.

A number of smaller dykes 1 to 9 feet wide of similar composition are scattered throughout the hornblende granite-diorite complex. They strike at varying angles but appear to follow joint planes in the granite. Although fine grained, they show a diabasic texture on the weathered surface. Some contain scattered feldspar phenocrysts up to $\frac{1}{2}$ inch in length.

Pleistocene and Recent

The greater portion of the area is overlain by deposits of clay, silt, gravel, and sand of glacial origin. Clays and silts are widespread, with sand and gravel best exposed in the east.

A prominent esker-like ridge, partly buried by outwash deposits, trends N.30°W. across the area. The outwash is marked by a line of kettle lakes.

Low ridges or mounds of silt, sand and gravel in the more swampy areas are elongated parallel to the movement of the ice (southeast).

The larger streams and rivers have exposed boulder beds at a number of places, giving rise to rapids.

Where the streams have exposed bedrock, beautifully

striated surfaces are common. Other than in stream beds, striations were well exposed on recently uncovered lavas and also on a prominent hill of pink gneissic granite in the southeast, just west of Menard river. Grooves in the more weathered outcrops also indicate the trend of ice movement. On the last mentioned hill beach-like deposits are preserved high up in the slopes at several different levels. They possibly indicate changing levels of a glacial lake.

Erratic boulders up to 25 feet in diameter are widely scattered. The larger boulders are usually within a few miles of known outcrops of similar rocks.

Across the southern part of the greenstone belt many of the erratics are granite, suggesting that the central greenstone area, devoid of outcrop, might be partly underlain by granites. A few boulders of conglomerate, one about 10 feet in diameter, occur in the southeast corner.

STRUCTURAL GEOLOGY

Schistosity, Foliation

The hornblende schists strike roughly parallel to the granite contacts. However, exposures are few and the rocks highly deformed. Dips vary from 40° - 90° . Lineation plunging to the southwest in the volcanics was noted near Audet camp.

Gneissosity in the granite-diorite complex strikes east, parallel to its contact with the greenstone belt.

The grey biotite granite is well foliated on Turgeon river where it strikes $N.30^{\circ}W.$ and in Laberge township where the strike is a little east of north. Farther east the rock becomes more massive.

Gneissosity in the pink gneissic granite varies in strike between north and $N.45^{\circ}W.$

Folds

The metavolcanic and metasedimentary rocks have been intensely folded. Near Audet camp contact features between a volcanic agglomerate and a lava flow suggest that the beds have been overturned at least locally. A few small drag folds were seen in the hornblende schists. However, scarcity of outcrop makes the structure difficult to decipher.

Faults, Shear zones

A breccia zone 4 feet wide occurs on Turgeon river at the contact between granite and hornblende schist. In the southeast, in the pink granite, is a zone of highly sheared rock, cut by numerous quartz veins. Both the breccia and the shear zones strike a little west of north.

Jointing

Joints, generally in 3 sets, are well developed in the granitic rocks. Two sets are steeply dipping and mutually perpendicular; the other is nearly horizontal.

ECONOMIC GEOLOGY

Interest in the district in recent years has been shown by the staking of large blocks of ground in the greenstone belt. However, the results of the work done are not yet available.

Sulphides

Fine streaks of pyrite and pyrrhotite with traces of chalcopyrite are present locally in the hornblende schists. A sample from one mile north of Audet camp assayed 0.05% Cu, 0.02% Zn, and 0.01% Ni. A second sample just south of Audet camp assayed 0.05% Cu, 0.01% Zn, and 0.04% Ni.

Sheared hornblende schist associated with the breccia zone on Turgeon river carries pyrite and a little chalcopyrite. Assay values were 0.7% Cu, 0.02% Zn, 0.01% Ni and 0.03% Co.

Disseminated pyrite is a common constituent of all the volcanic rocks. It occurs also in the pink granites and in the pink hornblende granodiorite on Turgeon river. Cubes of pyrite occur in clusters along fractures and associated with chlorite in a coarse-grained granite in the southwest corner of the area, and are up to $\frac{1}{4}$ inch square in a sheared volcanic rock northeast of Audet camp.

Fluorite

The sheared zone in the coarse-grained, pink granite contains a little pyrite and thin stringers of purple fluorite.

Iron

Boulders of chert with bands rich in magnetite and pyrite were present in boulder deposits across the central portion of the area.

Sand and Gravel

Large quantities of sand and gravel are available along the esker in Laberge and Paradis townships. Smaller hills and ridges of sand and gravel near Audet road may be of economic importance.

REFERENCES

- Flaherty, G.F. (1939) - Perron-Rousseau Sheet, Abitibi Territory and Abitibi County, Quebec; Canada Dept. Min. and Res., Min. and Geol. Br., Geology 1936. Map 482A, East Half; Map 483A, West Half.
- Remick, J.H. (MSS.) - Preliminary Report on Harricana-Turgeon Area (In preparation, Que. Dept. of Natural Resources).
- Tanton, T.L. (1919) - The Harricana-Turgeon Basin, Northern Quebec; Geol. Surv. Can., Mem. 109, 1919.
- Thomson, R. (1936) - Geology of the Burntbush River Area; Ont. Dept. Mines, Vol. XIV, Pt. VI, pp. 49-63, 1936.
- Wilson, J.T. (1938) - Mistawak Map-Area, East Half, Quebec; Prel. Rep. Geol. Surv. Can., Paper 38-18.
- (1938) - Mistawak Map-Area, West Half, Quebec; Prel. Rep. Geol. Surv. Can., Paper 38-19.
- (1938) - Mistawak Lake, Abitibi Territory and Abitibi County, Quebec; Can. Dept. Min. and Res., Min. and Geol. Br., Geology 1937. Map 533A.