

RP 316(A)

PRELIMINARY REPORT OF PASHASHIBOU AREA, DRUCOURT AND COSTEBELLE TOWNSHIPS, SAGUENAY COUNTY

Documents complémentaires

Additional Files



Licence



License

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 MINES

HON. W. M. COTTINGHAM, MINISTER

A.-O. DUFRESNE, DEPUTY MINISTER

GEOLOGICAL SURVEYS BRANCH

I. W. JONES, CHIEF

PRELIMINARY REPORT

ON

PASHASHIBOU AREA

DRUCOURT AND COSTEBELLE TOWNSHIPS

SAGUENAY COUNTY

BY

ROGER-A. BLAIS



QUEBEC
1955

PRELIMINARY REPORTONPASHASHIBOU AREADRUCOURT AND COSTEBELIE TOWNSHIPSSAGUENAY COUNTYby Roger A. BlaisINTRODUCTION

The Pashashibou area was geologically mapped during the summer of 1955. It is bounded on the south by the gulf of St. Lawrence and extends inland for about 18 miles to latitude $50^{\circ}30'$. On the east and west it is bounded by longitudes $62^{\circ}10'$ and $62^{\circ}20'$, respectively. The map-area includes about two-thirds of Drucourt township, the whole of Costebelle township, a very small part of La Richardière township, as well as a six-mile-wide strip along the northern border that has not yet been subdivided. In all it covers about 255 square miles. The nearest villages are Aguanish, 4 miles east of the eastern margin, and Baie Johan Beetz, 14 miles west of the western margin. The area is about 175 miles east of Sept-Iles, the largest town on the North Shore, and 500 miles below Quebec City.

The southern part of the area can easily be reached by fishing-boat from Baie Johan Beetz, which is serviced regularly during the summer months by ships of the Clarke Steamship Company Ltd. sailing from Montreal and Quebec.

To reach the interior, three canoe routes may be followed. One leads to Costebelle lake by way of the small and shallow Pashashibou river. The first half of this six-mile route is easily travelled at high tide and the second half includes seven short portages. Nabisipi river, with ten short portages in the first seven miles, gives easy access to the territory northeast and southeast of Costebelle lake. Navigation on the upper section of this river is rendered difficult in late summer because of a lack of water and a boulder strewn river bed. Finally, the third canoe route follows Petite Watshishou river from a point about two miles north of Pontbriand bay (1), which is a short distance to the west of the map-area. It gives access only to the northwest corner and involves more than 20 portages in its 18-mile length, the longest being about half a mile long.

The territory inland from the sea coast can also be reached by sea-plane from the base at Havre St. Pierre, located about 55 miles west of the area. The only lakes suitable for water-landings are Costebelle and Pastour, near the centre of the area, and the small elongated lakes along Petite Watshishou river, in the northwest corner.

TOPOGRAPHY

The area is relatively flat and, in the interior, shows a local relief of about 250 feet with the highest hill rising to 750 feet.

(1) Cooper, Gerald E., Johan Beetz Area (Eastern Half), Saguenay County, Quebec Dept. Mines, P.R. 263, 1951.

above sea-level. It may be divided into three topographic units: the coastal belt, the terrain of quartzite and gabbro sills in the northwest corner, and the rest of the area underlain by granitic rocks.

The coastal belt extends about four miles inland and shows little relief. West of Pashashibou bay, the shoreline is intricately indented and fringed with numerous rocky shoals and small islands. In contrast, the eastern half of the coastal belt is relatively featureless, except for bedrock protruding through pond-dotted muskeg, some raised beaches, and numerous former strand lines.

A pronounced ridge and valley topography characterizes the northwest part of the area underlain by gabbro and sedimentary rocks. The gabbro forms long and continuous ridges, with narrow valleys occupied by less resistant quartzite.

The remainder of the area is underlain by granitic gneisses and may be described as an undulating surface gently sloping to the south. The granitic gneisses form low and very continuous ridges which strikingly outline the trends of their gneissic layering and reflect the major fold patterns.

GENERAL GEOLOGY

With the exception of fracture fillings of limestone found at several localities along the coast, all the rocks in the area are of Precambrian age. Listed in order of abundance they are: granitic gneisses, gabbro, gneissic granite, predominantly quartzitic sedimentary rocks, small masses of massive late granite, and several large pegmatite dykes.

The area may be divided geologically into two distinct units by an arcuate fault line trending north-northeast and passing through Caron lake one mile west of Costebelle lake. The formations to the west are slightly metamorphosed sedimentary rocks, with a narrow belt of schists of sedimentary origin, which have been intruded by several continuous sills of gabbro. The rocks to the east, on the other hand, are largely granitic gneisses. They form a highly folded crystalline complex, cut by several irregular masses of granite and a few tabular bodies of gabbro. Large and continuous tabular bodies of pegmatite have been intruded along the contact zone between these two main series of rocks. There is also a thin continuous sill of granite porphyry in the quartzite about a half a mile from the fault.

As the area is nearly continuous rock exposure, the locations of the innumerable outcrops observed have been omitted on the accompanying preliminary map.

Table of Formations

Pleistocene and Recent	Sand, gravel, erratic boulders, clay and peat
Great Unconformity	
Paleozoic (?)	Limestone (Ordovician ?) filling fractures in Precambrian rocks
Great Unconformity	
Precambrian	<p><u>GRANITES:</u></p> <p>Granite porphyry Muscovite pegmatite</p> <hr/> <p>Massive biotite granite</p> <hr/> <p>Gneissic granite</p>
	<p><u>GABBROS:</u></p> <p>Hornblende gabbro and uralitic gabbro</p> <hr/> <p>Pyroxene gabbro and ortho-amphibolite</p>
	<p><u>WAKEHAM SERIES:</u></p> <p>Grey micaceous quartzite, hematite-rutile quartzite, white quartzite, slate, conglomerate.</p> <p>Quartz-sericite schist, biotite schist, garnetiferous biotite schist, garnetiferous staurolite schist.</p>
	<p><u>GRANITIC GNEISSES:</u></p> <p>Augen gneiss Banded granitic gneiss, with some paragneiss.</p>

Precambrian

Granitic Gneisses

Augen gneiss and banded granitic gneiss, including several thin and discontinuous bands of paragneiss, occupy most of the sector east of the Caron Lake fault. The granitic gneisses form wide and continuous belts showing striking fold patterns.

The paragneisses included in the granitic gneisses are quartzo-feldspathic hornblende-biotite gneisses that more or less grade into the gneisses and have been intruded intimately by innumerable thin sills of biotite pegmatite. They are distinguished from the sedimentary rocks west of the Caron Lake fault by their mineralogical composition, a distinct gneissic layering, a pronounced granulo-se texture, and a high degree of metamorphism.

Banded granitic gneiss is in two wide tongue-shaped zones forming the core of major anticlinal folds. One zone surrounds Jalobert bay and extends three miles northward from the end of the bay; it has a width of two miles. The other, about four miles wide, extends northwesterly from the mouth of Nabisipi river to the south bay of Costebelle lake. This medium-grained and pinkish grey rock, of granitic composition, is characterized by a pronounced gneissic layering caused by layers and lenses of quartz and feldspars alternating with streaks of biotite and hornblende. The layering is accentuated by thin sills or bands of pegmatite.

The two belts of banded granitic gneiss are each flanked by a similarly continuous belt of augen gneiss, about two miles wide. Near Costebelle lake augen gneiss outlines a basin structure and also forms the core of a large dome. This rock is pink and medium-grained, and shows some gneissic layering in addition to a well developed augen structure. The augen have an average diameter of one inch and comprise between 50 and 75 per cent of the rock volume. They consist of pink felsic material or, less commonly, of lenticular aggregates of pink feldspar crystals, which are enclosed in a foliated grey granitic matrix containing varying amounts of biotite and hornblende.

Wakeham Series

The predominantly quartzitic sedimentary rocks found west of the Caron Lake fault are the southeast extension of a thick sedimentary sequence, covering several hundred square miles, herein termed "Wakeham series". Mapping in adjacent areas to the west and northwest by parties of the Quebec Department of Mines has shown that this series extends about 20 miles west of the west boundary of the map-area and at least 50 miles inland from the coast.

Within the map-area rocks of the Wakeham series are exposed mainly west of the Caron Lake fault, but also underlie a small wedge-shaped zone east of the fault at the northern boundary of the area. Quartzite is the predominant sedimentary rock and comprises the following varieties: white vitreous quartzite, grey micaceous quartzite, feldspathic quartzite and hematite-rutile quartzite. The impure varieties are thin-bedded and, in several places, cross-bedded. Ripple-marks were found in two localities. Interbedded with these rocks are a few beds of slate and conglomerate. These sedimentary rocks are definitely of lower metamorphic rank than the paragneisses found in the granitic gneisses.

An arcuate belt of schists of sedimentary origin, about half a mile wide and trending N.35°E., follows the lower portion of Petite Watshishou river and extends northerly to Staurolite lake three miles northwest of Costebelle lake. Within this belt, the degree of metamorphism increases gradually eastward, the following types of schists being found from west to east: quartz-sericite schist, sericite-biotite schist, garnet-biotite schist and garnet-staurolite schist.

Gabbros

Intrusive into the Wakeham quartzites are numerous sills of hornblende gabbro, which range in thickness from 50 to 1,500 feet and are generally continuous over the whole extent of the Wakeham series within the map-area. The hornblende gabbro is greenish black, massive and generally coarse-grained. In several places it has an ophitic texture and resembles a diabase. Many sills have very fine-grained, possibly chilled, borders. This gabbro consists of about equal amounts of hornblende and plagioclase, with small amounts of epidote, biotite, sphene and magnetite.

In contrast with the massive hornblende gabbro west of the belt of sedimentary schists, the gabbro to the east is highly altered and schistose. It forms a composite sill, more than 7,000 feet thick, with only a few bands of recrystallized quartzite. This gabbro is chiefly composed of clusters of uraltic amphibole, with varying amounts of epidote and altered plagioclase feldspar.

Several tabular bodies of pyroxene gabbro and associated ortho-amphibolite have been found in the granitic gneisses. The larger ones only are shown on the accompanying map. These bodies, which range in thickness from a few feet to 1,000 feet, are less continuous than the gabbro sills intrusive in the Wakeham series and they follow the structure of surrounding gneisses for a few miles. The pyroxene gabbro, where unaltered, is massive, fine- to medium-grained, purplish brown and has a typical salt-and-pepper appearance. It consists essentially of pyroxene and calcic plagioclase, with some olivine, hornblende, biotite and titaniferous magnetite. The rock resembles some varieties of gabbro found by the writer to be related to anorthosite masses in the North Shore region. It is not known whether the pyroxene gabbro cutting the granitic gneisses is co-magmatic with the hornblende and uraltic gabbros or older than these. In several bodies, it has been converted by metamorphism and by injection of pegmatitic solutions into a black, medium-grained, highly schistose amphibolite.

Granites

Gneissic granite has a somewhat irregular distribution. It forms a belt around augen gneiss in the dome one mile north of Costebelle lake and outcrops extensively along the upper part of Nabisipi river. It is also found east and south of Caron lake and along Pashashibou river. The gneissic granite is pink, medium- or coarse-grained, and generally gneissic. Quartz, feldspars and biotite are the main constituents.

Massive biotite granite cuts all the previously described rocks. It is pink and medium-grained, with an equigranular texture. It consists essentially of feldspars and quartz, with some biotite and magnetite.

Pegmatite. The granitic gneisses contain a large proportion of pegmatitic material forming discontinuous layers that pinch and swell along strike. These pegmatitic layers, as well as all the rocks described above, are cut by numerous pegmatite dykes that have sharp boundaries and that generally are more than 10 feet thick. The earlier pegmatites consist essentially of quartz and feldspars, with minor amounts of biotite whereas most of the later pegmatites contain about 20 per cent of biotite and muscovite. The late pegmatites along the Caron Lake fault, on the other hand, have about 20 per cent of muscovite, very little biotite, and about 25 per cent of quartz which is intergrown with feldspars. The late pegmatites are the coarser, but at that the average size of its crystals is only about six inches.

Granite porphyry. Two thin sills of granite porphyry are found in the quartzite of the Wakeham series near the Caron Lake fault. The longer one, which is about a mile west of Costebelle lake, is about 300 feet thick and has been traced for seven miles. The other, about 100 feet thick and three miles long, is one mile and a half west of Caron lake. The porphyry is characterized by phenocrysts of pink feldspar and bluish quartz in a slightly schistose and fine-grained feldspathic pink matrix.

Paleozoic (?)

Limestone "Dykes"

At several places along the coast, fracture fillings of limestone are found in the igneous rocks. The limestone is dark grey and very fine-grained. It contains a few rounded grains of quartz and small nodules of clear calcite, as well as small angular fragments of country rock. This limestone is probably of the same age as the Ordovician limestone forming the Mingan Islands some 30 miles to the west.

Pleistocene and Recent

The evidence gathered from numerous glacial striae indicates that the Pleistocene glaciers crossed the area in a direction varying from south to south-southwest. The hilltops are generally bare, with relatively few erratic boulders, whereas the valleys are covered by a thin blanket of reworked glacial sand and gravel. Other signs of glaciation include "roches moutonnées", fluting, friction cracks and chatter marks.

River and lake deposits of recent age occupy the valley of Nabisipi river and the valley of the lower half of Pashashibou river. From bottom to top, they form a sequence of pale grey laminated clay, brownish grey laminated silty clay, bluish grey unstratified clay, and sand. The coastal belt east of Pashashibou bay is extensively covered by a thick mantle of sand and shows raised beaches and numerous strand lines. One mile inland from this part of the coast, in an area dotted with ponds, the sand is overlain by a layer of peat of unknown thickness.

STRUCTURAL GEOLOGY

The map-area, structurally, may be divided into two distinct parts that are separated by the Caron Lake fault: the western one, underlain by quartzites and sills of gabbro, and the eastern part in which most of the rocks are granitic gneisses.

In the western part, the quartzite beds dip steeply either to the west or to the east but always face west. They are part of the east limb of a north-south trending syncline the axis of which is a few miles west of the map-area.

Between the narrow belt of schists and the Caron Lake fault, the trend of the structure is deflected to a more northeasterly direction. The schistosity in the uralitic gabbro between Staurolite and Caron lakes dips progressively at a lower angle to the west as the Caron Lake fault is approached. Most lineations, however, plunge at an angle of 30 to 40 degrees to the west, irrespectively of the variations in strike and dip of the schistosity.

In that part of the area underlain predominantly by granitic gneisses, there are four major folds: two large anticlines, one dome and one basin. One of the anticlines is at Jalobert bay and maintains a six-mile long arcuate axis that trends north-northwest and plunges at an angle of about 40 degrees in that direction. The axis of the other anticline, between Pastour lake and Pashashibou river, trends northward from a point a mile and a half east of the mouth of Nabisipi river for about five miles, then it follows a north-westerly direction for another eight miles. Here, half a mile southwest of Costebelle lake, this anticline ends against gneissic granite and plunges at an angle of about 60 degrees to the west. Both anticlines have a core of banded granitic gneiss and flanks of augen gneiss.

A prominent dome, with a diameter of about five miles, is centered symmetrically around a point one mile east of the north bay of Costebelle lake. It has a core of augen gneiss, with a surrounding belt of gneissic granite. Another well-marked structure is a basin in the augen gneiss half a mile east of the east bay of Costebelle lake.

Small shears and minor faults are found in several places, but their locations are not shown on the accompanying preliminary map. The presence of a major northeasterly-trending fault zone (the Caron Lake fault) separating the Wakeham sedimentary series and associated gabbro sills from the granitic gneisses is indicated by signs of hydrothermal alteration, thick and extensive bodies of muscovite pegmatite, innumerable quartz stringers, dragfolds, and a few zones of shearing and brecciation. Possibly another strike fault of similar trend extends from the lower part of Petite Watshishou river through Staurolite lake. As this presumed fault is approached from the west, the sedimentary rocks of the Wakeham series show an abrupt increase in degree of metamorphism. The uralitic gabbro between this presumed fault and the Caron Lake fault is very schistose and altered.

ECONOMIC GEOLOGY

The presence of a variety of rocks of both igneous and sedimentary origin, of structures of major importance, and of some signs of mineralization indicates that the area merits attention.

Small disseminated grains of pyrite were found in schistose gabbro in a few places along the contact between the quartzite-gabbro assemblage and the granitic gneisses. The large pegmatite bodies along the contact are slightly radioactive. In addition to these features, the fact that there are signs of hydrothermal alteration and evidence of shearing and brecciation along or near the contact, indicates that careful prospecting in this zone and along its northern extension is warranted.

Some pegmatite dykes along the coast contain small amounts of magnetite and, more rarely, molybdenite. On the east side of Falchert bay, a few grains of fluorite were found nested in a small shear zone in banded granitic gneiss.
