

RP 248(A)

PRELIMINARY REPORT ON PARTS OF DUPARQUET, HEBECOURT, PALMAROLLE AND ROQUEMAURE TOWNSHIPS,
ABITIBI-WEST COUNTY

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PRELIMINARY REPORT
ON PARTS OF
DUPARQUET, HÉBÉCOURT, PALMAROLLE
AND ROQUEMAURE TOWNSHIPS
ABITIBI-WEST COUNTY

BY

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Preliminary Report

on Parts of

Duparquet, Hébécourt, Palmarolle and Roquemaure Townships

Abitibi-West County

by B. Lee

INTRODUCTION

During the summer of 1949, the writer and assistants mapped the geology of some 50 square miles in Abitibi-West county, comprising the following areas:

Duparquet township, ranges III and IV, west half;
Hébécourt township, range IV;
Palmarolle township, ranges I and II, west half;
Roquemaure township, ranges I and II.

Mapping was done on a scale of 1 inch equals 1,000 feet. The area is covered by map 293A of the Geological Survey of Canada, "Palmarolle Sheet, Abitibi County, Quebec", which is on a scale of 1 inch equals 1 mile.

The area, which is well supplied with roads, is readily reached from the two nearest centres of any consequence - Duparquet, six miles to the south, and La Sarre, fourteen miles to the north - which are connected by an excellent gravelled highway. This highway forms the eastern boundary of the area. Range roads traverse the area from east to west, and they are connected by an occasional north-south road. The western portions of roads in Roquemaure township are ungravelled, and are thus quite impassable in wet weather. They are the only exceptions in a system of otherwise all-weather roads. The entire area is very largely under cultivation, with the exception of the eastern two-thirds of range IV, Hébécourt township, which is taken up by large bare ridges of rock separated by flat-floored draws covered by dense young deciduous bush. The entire area is, therefore, readily accessible to motor car or truck, and very easily traversed on foot. The area within Palmarolle and Duparquet townships is older, in terms of colonization, than the other parts of the region, and as a result is even more readily traversed than the other areas.

PHYSIOGRAPHY

The area lies within the clay belt region of northwestern Quebec, the so-called Abitibi plain, and shows the customary relief of this region. This consists of a relatively level plain, underlain by sands and varved clays, above which rise both small isolated outcrops, and a series of rock ridges. The ridges within the area trend in a general direction of N.75°W. They are separated by valleys floored at the general level of the Abitibi plain. The unconsolidated glacial deposits have been terraced by streams which were

apparently graded with respect to various former higher levels of Abitibi lake. Ridge profiles are for the most part smooth and gently rounded. However, there occur occasional fault-line scarps, in places forming cliffs about 75 to 100 feet high. The ridges are more frequent, and more closely spaced, in the area to the west of the Duparquet river. Southern slopes of numerous ridges show mantles of heavy deposits of sands and gravels which from place to place have been opened up as sources of road ballast.

Little water occurs on the surface of the area. Lakes and natural ponds are absent, and any swamp-like areas encountered west of Duparquet river were due to the activities of beavers. East of this river lie more extensive swampy tracts, which, however, form inconvenient areas only during the early part of the season. The few rivers are narrow, deep, muddy, and relatively sluggish. They occupy wide, steep-walled valleys, across the bottoms of which they pursue meandering courses.

On the whole, a far greater percentage of the area east of the Duparquet river is given over to the Abitibi plain than is the case west of this river.

GENERAL GEOLOGY

The consolidated rocks are all of Precambrian age, and consist of a series of acid and intermediate volcanic rocks dipping sharply towards the south, and topping south. There are several beds of flow-breccia and agglomerate. Several narrow, discontinuous bands of tuff and iron formation also occur. A single band of carbonated, massive andesite persists for some three miles along strike in the southern part of the area.

The area represents the north limb of a syncline, with axis lying to the south. Following the folding, the volcanic series has been intruded by diorite and gabbro; also dykes of basic rock and of granite and feldspar porphyries.

Few faults or shears are visible within the area. With a single exception, any evidence of faulting is purely topographic. The exception, a strong shear zone visible across a large hill of rhyolite in the north part of lots 48 and 49, range I, Roquemaure township, when taken in conjunction with abundant topographic evidence, points to the existence of a possible shear zone crossing the entire area in a direction slightly north of west.

The following table lists the geologic data as interpreted within the area:

Table of Formations

Cenozoic	Recent	Forest soils Gravels, sands
	Pleistocene	Varved clays Gravels, sands Till
Great Unconformity		
Early Precambrian (Archaean)	Keewatin-type volcanic rocks	Peridotite Granite Diorite Gabbro ("older" diorite)
		Andesite: massive, pillowed massive Fragments, agglomerate Rhyolite Andesite

Keewatin-type Rocks

Rhyolite:

A belt of rhyolite trends N.72°W. across the eastern and central parts of the area. In Palmarolle township, the northern boundary extends from the centre of lot 31, range I, northwest to the centre of lot 8, range II. From this point, the north edge of the map forms the northern boundary of the rhyolite as far west as lot 53, range II, Roquemaure township, thence the boundary runs S.60°W, into lot 43, range II, thence N.60°W. into the north end of lot 34, range II. The southern boundary extends from lot 31, range IX, Duparquet township, due west to lot 22, thence north of west into the

north end of lot 34, range II, Roquemaure township. The rhyolite thus tapers to a point between massive andesite and gabbro. The rhyolite has a maximum thickness of 15,000 feet within the area. Rhyolite is also known to extend north, well into range III, Roquemaure township. The rhyolite, which weathers light grey to almost white, is, for the most part, very fine grained, and breaks with a sub-conchoidal fracture. Locally the rock is porphyritic and shows phenocrysts of feldspar and quartz. Certain sections of the rhyolite show very high percentages of rhyolitic and tuffaceous fragments, which give the rock the appearance of an agglomerate. In Palmarolle township, the porphyritic texture is pronounced, giving to the rock the distinct appearance of intrusive material. In some areas undoubted effusive rhyolite is apparently intruded by porphyritic rhyolite. This "complex" can best be explained by the filling of cavities (tunnels, blisters, etc.) within older flows by the liquid material of younger flows.

Andesite:

Greenstones (andesitic lavas) are the predominant rocks of the area. They occur as two bands, one parallel to the rhyolite in the northeast corner of the area and the second parallel to the rhyolite in the southern and western two-thirds of the area.

The andesites weather brown or dark green. Fresh glacially-polished surfaces are dark greyish green to dark green.

Andesite occurs both as massive and as pillowed flows. The alternating flows have the same general strike as the rhyolite, N.72°W. Both show a variable proportion of spongy fragmental material of andesitic and tuffaceous nature. Thus it is that in places the massive flows appear to be almost of the nature of an agglomerate, whereas elsewhere only isolated, somewhat elongated, spongy fragments are found. Within the pillowed flows, the same variable proportion of fragments occurs. Here the fragments are packed between the unbroken rims of contiguous pillows. Fragments may comprise up to 35 per cent of the rock volume.

Most of the andesite is pillowed. Rims are well vesiculated, and a high proportion of quartz amygdules occurs. There are two recognizable types of pillows. An older, northern, pillowed andesite contains pillows ranging from 8 inches up to 8 feet in length by about 4 inches to 3 feet in breadth. The younger, southern, flows have smaller pillows of more uniform size, 8 inches to 12 inches long by almost the same breadth, giving the flow the appearance of an accumulation of melons. These smaller pillows are, within intact rims, quite fragmented.

Agglomerate and Tuff:

As already stated, the proportions of fragments appearing in the rhyolite and andesite often give these rocks the appearance of an agglomerate. However, a belt of undoubted agglomerate 30 feet thick occurs at the top of the rhyolite. In this band small, angular, white-weathering, somewhat equidimensional fragments, with diameters of 1 inch to 3 inches, are set in a matrix of dark green-weathering andesitic material. This band forms a very distinct feature in the north ends of lots 48 to 53, range I, Roquemaure township, on the west bank of the Duparquet river in lots 58 and 59, range I, Roquemaure township, and in lot 3, range I, Palmarolle township.

Narrow bands of highly siliceous tuff, often indistinguishable from chert, are present within the andesites. The most striking of these occurs at the south end of lot 49, range II, Roquemaure township, where the tuff is highly crumpled and associated with bands of magnetite. This band is some 3 feet wide. A cherty tuff also occurs in an outcrop of massive andesite in the north end of lot 33, range I, Roquemaure township. In all cases the tuff occurs in narrow discontinuous bands, in no case traceable for much over 200 feet.

Post-Keewatin-type Intrusive Rocks:

Gabbro:

Gabbro occurs in the form of a long narrow stock invading the rhyolite along the north boundary of the area. The stock extends about 23,000 feet, from the centre of lot 29, range II, to lot 54, range II, Roquemaure township. The gabbro reaches a maximum width of 3,300 feet in lots 42 and 43, range II, Roquemaure township.

The gabbro stock forms a distinct hill, flanked by sands and clays. Wherever the contact with the invaded rhyolite is seen, a narrow chilled edge occurs. Within the gabbro the texture varies enormously from place to place and over very short distances. Some of the coarsest-grained parts occur within inches of the gabbro-rhyolite contact. Elsewhere, gabbro of almost basaltic texture lies well within the exposure.

From place to place, considerable quartz appears as an integral part of the rock. Segregations of ferromagnesian minerals are common, and have given rise to the development of actinolite and fibrous serpentine. A great deal of epidote occurs along joints. The gabbro weathers to a rich chocolate-brown colour, which makes outcrops noticeable for a considerable distance.

A small outcrop of the same coarse-grained gabbro occurs beside the road on lots 7 and 8, range II, Palmarolle township.

Diorite:

Diorite occurs mainly in the southern third of the area. A discontinuous tongue enters from range IX, Hébecourt township (east half), and is found intruding pillowed andesite. A large mass also occurs on the north boundary of lot 12, range X, Hébecourt township, as an isolated outcrop. This particular outcrop occurs within pillowed andesite, but nowhere is a contact visible. Several small outcrops that occurs close to the gabbro in the northern part of range II, Roquemaure township, have been mapped as diorite. It is possible that these represent, however, a facies of the gabbro. Another large outcrop of diorite occurs on lots 12 and 13, ranges I and II, Palmarolle township. Like the gabbro, the diorite from place to place shows considerable quartz, either as grains interlocked with the other constituents, or as rounded eyes.

Acidic Dykes:

A few widely scattered, narrow, acidic dykes have been noted. They are found cutting the gabbro, as well as the earlier volcanic rocks. These dykes are of a very fine-grained, grey-weathering material though in places the texture is similar to that of aplite.

Basic Dykes:

These are for the most part andesitic in character. The dykes are very fine grained, and weather to a colour varying from a bright olive-green to the dark greenish-black associated with basalts. Such dykes intrude all rocks of the area. They occur most commonly in range X, Hébécourt township, in the neighbourhood of the centre line of the township. Excellent chilled edges occur along the boundaries of the dykes. A number of the dykes have narrow zones of amygdules paralleling both walls.

A very narrow lamprophyre sill occurs on lot 33, range I, Roquemaure township, where it traverses an outcrop of massive andesite. Here the lamprophyre occurs as an 18-inch intercalation within a band of cherty tuff 4 feet wide. The lamprophyre is remarkable in that the mica present is muscovite, which occurs in fine books, giving a silky luster on fresh surfaces of the rock.

Few diabase dykes occur within the area.

Granite:

The western boundary of an extensive granite batholith occurs in lot 25, range II, Palmarolle township. As far as was noted, this granite forms the major rock type within the east half of ranges I and II, Palmarolle township, and extends farther east into Poularies township as well.

The granite is a grey-weathering hornblende variety, and is found cutting both the rhyolite and an older massive andesite. Wherever noted, the granite-volcanic contact was very distinct, unlike the contact-zone suggested by the earlier maps as lying farther to the east.

Peridotite:

A small boss of peridotite occurs in the south-central portion of lots 45 to 48, range I, Roquemaure township, where it intrudes massive andesite. The peridotite, which weathers to a distinctive whitish-grey, is best seen where it forms the steep south scarp of an isolated large hill in lot 45. Below the south scarp of the hill, scattered outcrops occur for about 300 feet, beyond which bedrock is covered for a distance of 400 feet to the south. South of this drift-covered area, pillowed andesite is found.

The band of peridotite is continuous easterly for about 700 feet of unbroken outcrop. Farther to the east, peridotite again occurs in a narrow intrusion in the south end of lot 48, range I, where it again lies within massive andesite.

A set of irregularly spaced joints contains narrow seams of asbestos. On the average the seams are 2 mm. thick, and are filled with rather brittle fibre. Other seams are filled with serpentine. The number of seams per unit area varies greatly across the surface of the outcrop.

The peridotite appears to terminate in lot 45; however, no eastern contact was discovered, therefore it is possible that peridotite occurs farther to the east under the overburden.

Pleistocene and Recent Deposits:

The low, flat-lying sections of the area are underlain by varved clays, as shown by the excavations of several creeks. The varved clays in place overlie extensive deposits of coarse sands and gravels, and in turn are overlain by the same. Pleistocene deposits also form a number of somewhat crudely oval hills, which resemble drumlins. Such hills, however, occur singly, and in quite widely separated areas. It is felt that they probably have rock cores.

A single, short, well defined esker crosses the area from lot 19, ranges II - III, Palmarolle township, to the central part of lot 23, range IX, Duparquet township.

Sand and coarse gravel occurs as well defined tails in the lee of nearly every rock hill of the area. Boulders within the gravels are, in the main, of granite and hornblende gneiss.

The valley walls of the small streams are in every case cut below flat land surfaces developed on unconsolidated glacial deposits.

STRUCTURE

Folding:

The extrusive rocks form part of the north limb of a syncline with axis to the south of the area. The flows strike N.72°W, from the east boundary as far west as lot 7, range II, Roquemaure township. To the west of this, they appear to strike approximately S.75°W. Dips for the most part are vertical or steep south; in certain sections, however, the dips are steep north indicating slight overturning. Strikes vary from the regional trend rather considerably in the north ends of lots 18 to 20, range I, Héhecourt township, and in the south of lots 49 and 50, range II, Roquemaure township. These variations appear to represent local dragging. This is certainly the case in the second locality.

Faulting:

With the exception of one major shear zone, which stands out very prominently, evidence of faulting is purely topographic.

A zone of very intense shearing enters the area at the southeast corner of the map. Here the shear involves the rhyolite, which has been sheated to a paperlike fissility. The zone is highly carbonatized, and, further, contains some disseminated fine pyrite. The strike here is east-west.

Farther west, at the south end of lot 20 and one-third up lot 14, range IX, Duparquet township, there occur large outcrops of rhyolite which are similarly sheared and carbonatized. The strike of the fissility in lot 20 is east-west; in lot 14, it is N.80°W. A band of agglomerate in the centre of lots 11 and 12, range IX, Duparquet township, is similarly highly sheared.

No further evidence of shearing occurs towards the west-north-west until the north end of lots 48 and 49, range I, Roquemaure township, where rhyolite again is highly sheared and carbonatized. Farther to the north-west, in the north ends of lots 16 to 19, range II, Roquemaure township, a steep fault-line scarp bounds the northeast face of a large hill of andesite.

It is felt that these shears form parts of a single major shear which therefore crosses the area in a direction almost parallel to the general trend of the flows. This possibly represents a branch of a major shear trending somewhat south of west which lies south of the area mapped.

Younger faults of apparently small displacement exist, which strike, on the average, about N.25°E. The evidence here is topographic. The major rock ridges which cross the area show sharp draws which trend about N.25°E. These are bounded by almost vertical walls, and the crests of the ridges show some little offset.

ECONOMIC GEOLOGY

Roquemaure township and range X, Hébecourt township, have practically no prospecting history. The gabbro in the north end lot 47, range II, Roquemaure township, has been trenched for some 15 feet, showing massive gabbro with a very small amount of disseminated pyrite and chalcopyrite.

Some trenching has been done in the fissile rhyolite at the southern end of lot 32, range I, Duparquet township, exposing a strong shear zone which is well carbonatized and carries finely disseminated pyrite. Graham (1) mentions similar shear zones in eastern Hébecourt township, where they possibly represent a continuation of this same zone.

(1) Graham, R.B., Hébecourt Lake Map-Area, Abitibi-West County:
Que. Dept. Mines, P.R. 216, p. 18.