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PRELIMINARY REPORT ON ROHAULT AREA, ABITIBI-EAST AND ROBERVAL COUNTIES

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PRELIMINARY REPORT

ON

ROHAULT AREA

ABITIBI-EAST AND ROBERVAL COUNTIES

BY

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

Location and Means of Access

The Rohault area, mapped during the summer of 1951, lies between latitudes 49°15' and 49°30' N. and between longitudes 74°15' and 74°30' W. It covers about 200 square miles of Abitibi-East and Roberval counties and is about 25 miles slightly west of south of Chibougamau lake and some 110 miles northwest of lake St. John. It includes almost all of Rohault township, about two-thirds of Robert, narrow strips of Crisafy, Gamache, and La Dauversière townships, and the southeastern corner of Fancamp township.

The area is easily accessible by hydroplane from bases in the Chibougamau, Lac La Blanche, Lake St. John, and Abitibi regions. Rohault, Nemenjiche, Gabriel and Norhart lakes afford good landing places, but Robert and Manard lakes, although large, are rather shallow and have shoaly bottoms making hydroplane landings somewhat hazardous during times of low water.

The St. Félicien-Chibougamau highway passes about four miles east of the northeastern corner of the map-area, and the construction of a branch road from the highway to Norhart lake, in the northern part of the area, is planned for the near future. Rohault lake is easily accessible by canoe from Ducharme (Nicobau) lake, along the Chibougamau highway, through Bouteroue (Owen) lake and its outlet river.

The main lakes of the area are linked together by good portages, except for the one between Nemenjiche and Rohault lakes which crosses a large muskeg and along which the ground is very soft. The upper stretch of Nemenjiche river contains numerous rapids.

The area is immediately south of the Queylus area mapped by Imbault in 1950 (1).

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- (1) IMBAULT, P.E., Preliminary Report on the Queylus Area, Abitibi-East and Roberval Counties; Que. Dept. Mines, P.R. No. 250, 1951.

Topography

The area straddles the height-of-land between the Chibougamau-Nottaway and Lake St. John-Saguenay drainage basins. It has, however, a subdued topography and the highest hills, located just south and along the east shore of Rohault lake, are no more than 250 feet above the surrounding country. Rohault lake, the largest of the area, is about 1,280 feet above sea-level, and the respective elevations of Nemenjiche, Gabriel, and Robert lakes are about 1,300, 1,280, and 1,300 feet.

GENERAL GEOLOGY

All the consolidated rocks of the area are of Precambrian age. They include volcanic, tuffaceous, gabbroic and dioritic Keewatin-type rocks, which underlie the northernmost part of the map-area, and a series of paragneisses and orthogneisses, generally considered as belonging to the Grenville sub-province. Numerous, generally small, Late-Precambrian diabase dykes are also present in the area.

A sequence of the formations of the area is tentatively presented in the following table.

Table of Formations

CENOZOIC	Recent and Pleistocene	Peat, sand, gravel, glacial till
Great unconformity		
LATE-PRECAMBRIAN	Keweenawan(?)	Diabase dykes
EARLY-PRECAMBRIAN	Grenville-type	Biotite orthogneiss, biotite-hornblende orthogneiss, hornblende orthogneiss
		Garnetiferous biotite paragneiss biotite paragneiss
	Keewatin-type	Gabbro and diorite Schistose basalt, a little andesite and tuff

Keewatin-type Rocks

Keewatin-type volcanic, tuffaceous, gabbroic and dioritic rocks underlie about 25 square miles of the map-area. They form a belt, which ranges from a mile to three and one-half miles wide, along the entire northern border of the area. This zone is the southern extension of the one mapped by Imbault (1) in the Queylus area.

Within the limits of the present map-area, the main Keewatin-type rock is a schistose, dark green, basaltic lava, in places pillowed, amygdaloidal or, more rarely, fragmental. It is generally fine-grained, with hornblende and plagioclase as the principal constituents. A few exposures of more andesitic lava were seen within the basaltic flows. Towards the hornblende paragneiss zone to the south, the lavas in places contain a small amount of red garnet.

Thin beds of tuffaceous rocks were encountered at a few places within the lava flows. The tuffs are basic to highly feldspathic and generally show a well-developed, fine lamination.

Medium- to coarse-grained, equigranular, basic to intermediate, intrusive rocks crop out here and there throughout the mainly volcanic Keewatin-type rocks of the area. It is thought that these rocks belong to the "old" gabbro-diorite series found almost everywhere in association with the volcanics of the Temiscamian sub-province.

The large lenticular body of this type of intrusive rock north of Mannard lake is mainly a medium-grained dioritic gabbro, in places much altered and injected with quartz and carbonate. Exposures of medium- to fine-grained gabbro observed near the northern boundary of the map-area seem to be part of a thin, sill-like mass elongated in the direction of the strike of the adjacent volcanic flows. The numerous small isolated exposures of gabbro in the western part of the volcanic zone suggest that much of this section may be underlain by rock of this type.

Gneisses

Fine- to medium-grained, gneissic rocks underlie about 85 per cent of the map-area. They include two varieties of paragneisses and a granitic orthogneiss intruding them. Similar gneisses outcropping east and southeast of the present area are generally considered as belonging to the Grenville sub-province.

Hornblende Paragneiss

A generally gneissic, garnetiferous, hornblende-feldspar rock underlies about one-third of the map-area. It forms a broad, east-west-trending band across the entire area, immediately south of the belt of Keewatin-type rocks

(1) IMBAULT, P.E., op. cit.

described above and, in addition, several smaller zones such as: between Gabriel and Nemenjiche lakes, north and west of Bouteroue lake, and in the southernmost part of the map-area.

This hornblende paragneiss is usually a medium- to fine-grained, slightly to well foliated rock in which the gneissic structure is evidenced by the relative abundance of dark green hornblende, white feldspar, and red garnet. Hornblende, usually in well aligned needles, generally makes up more than 60 per cent of the rock. The amount of garnet ranges between 5 and 25 per cent.

The rock of the northern part of the zone adjacent to the Keewatin-type formations is, in places, only slightly gneissic and has more the appearance of a garnetiferous amphibolite in which there is a pronounced alignment of the hornblende needles. On a point along the east shore of Mannard lake and in the central part of the long peninsula separating Gaudreau bay from the main part of Rohault lake, remnants of altered gabbroic rock, surrounded by zones of garnetiferous amphibolite and of hornblende paragneiss, were identified.

Biotite Paragneiss

A generally well banded, medium- to fine-grained, biotite-feldspar-quartz-garnet paragneiss underlies close to 30 per cent of the area. It outcrops as a belt of irregular width extending from the western boundary of the map-area, across the southern part of Nemenjiche lake, to the central parts of Rohault and Bouteroue lakes, and as a second zone near the southeastern corner of the map-area.

The biotite paragneiss is generally a granoblastic rock in which the former bedding of sedimentary or tuffaceous rocks can be easily recognized. Some bands are almost exclusively made up of white feldspar, quartz and garnet, whereas others are very rich in biotite. Round grains of garnet are almost universally present in the rock. Where this mineral is absent, however, the thickly banded paragneiss may, on small exposures, be easily confused with the biotite orthogneiss described below. Hornblende is more or less abundant in some facies of the biotite paragneiss.

Orthogneiss

About 25 per cent of the map-area is underlain by a well foliated to slightly lineated, biotite-hornblende-feldspar-quartz intrusive rock. The biggest extent of rock of this type is around Gabriel lake and the southern and eastern parts of Rohault lake. Other masses of granite gneiss, possibly connected with the main body south of the present area, occur along the southern boundary of the map-area.

The orthogneiss is a fine- to medium-grained, grey to pink rock containing abundant injections of pegmatite and numerous, more or less digested, amphibolitic lenses and bands as inclusions. The fine-grained facies is generally rich in biotite, whereas hornblende is usually more abundant in the medium-grained variety. Mafic minerals make up about 20 per cent of the uncontaminated orthogneiss, and glassy quartz, 25 per cent. Moreover, two types of feldspar, a white and a pink, are visible in the rock. The pink feldspar is generally coarser;

it resembles the feldspar of the pegmatites abundantly associated with the orthogneiss and is probably a potassic variety. The other appears to be a sodic plagioclase.

Diabase

Numerous dykes of diabasic rock crop out in the area, especially in the southern half. They cut all of the different varieties of gneissic rocks of the area. A small diabase dyke was also reported cutting the Keewatin-type rocks on the Chibougamau Explorers property, near Norhart lake.

Most of the diabase dykes are less than 100 feet wide but one west of Nemenjiche lake is at least 500 feet across. The rock varies in composition from a dark-coloured, spotted, olivine diabase to a diabasic diorite in which creamy white plagioclase is the dominant mineral. The largest dykes have fresh, massive, and non-garnetiferous cores and gneissic or schistose, altered, garnetiferous border zones. The smaller dykes are generally altered and garnetiferous.

Narrow, black, porphyritic, lamprophyre dykes were also seen here and there throughout the whole area; some of them are definitely associated with diabase.

Cenozoic Deposits

The area is mostly covered with a mantle of glacial till thick enough to support a good growth of various evergreen and deciduous trees. Sand and gravel deposits are rather rare. A few small eskers seen in the area are indicated on the accompanying map. These eskers are generally made up of coarse gravel or of fine clayey sand. Little clay was observed in the area.

STRUCTURAL GEOLOGY

Folds

The Keewatin-type volcanic, tuffaceous, and gabbroic rocks of the northern part of the area, together with the northern section of the adjacent hornblende paragneiss zone to the south, have a general east-west trend similar to that of the area to the north (1). Farther south, the structural trend of the gneisses is much more variable.

In the Keewatin-type rocks, the dip of the schistosity is generally steeply south and, as far as could be ascertained, the schistosity is parallel to the trend of the formations. The pillows of the ellipsoidal lavas were found to be too disturbed to serve as an indication of the direction in which the flows face.

(1) IMBAULT, P.E., op. cit.

The contact between the Keewatin-type formations and the garnetiferous hornblende paragneisses is transitional. It seems to follow a moderately wavy line in the northeastern part of the map-area, but farther west exposures are widely scattered and the contact line here is shown only very approximately on the accompanying map. The schistose Keewatin-type rocks become more recrystallized towards the south and the schistosity is replaced by a gneissic structure, faint at first, but becoming better and better developed southward. Likewise, garnets, which are widely scattered in the schistose rocks in the vicinity of the contact, become more and more abundant until the rock has become a hornblende-feldspar garnet gneiss in which a compositional banding is a conspicuous feature.

The strike of the gneissic structure of the paragneisses is generally concordant with the outlines of the individual rock masses. In the orthogneiss, however, exceptions to this rule are abundant.

A few drag folds along the west shore of Gaudreau bay suggest that the hornblende paragneisses of the peninsula between the bay and the main part of Rohault lake form an anticlinal fold plunging towards the southeast. Similar structures in the biotite paragneisses of the south shore of Bouteroue lake, near the eastern boundary of the map-area, suggest at that place a syncline plunging towards the northeast. Elsewhere, the positions of the fold axes can only be conjectured from the shapes of the different areas of gneissic rocks as they appear on the accompanying map.

Shear Zones and Faults

Shear zones are abundant in the northern half of the map-area. In the southern part they are rare, although narrow shear joints were seen at a number of places.

The shears in the Keewatin-type rocks and in the hornblende paragneisses of the northern part of the area are generally close to east-west, although some are almost northeast-southwest and a few trend slightly south of east. The best exposures of sheared rocks are along the shores of Mannard lake, and on the Chibougamau Explorers and Noranda Mines properties, near the northern boundary of the map-area. The shear zones range in width from a few inches to more than 150 feet (on the Noranda Mines property - see below) and are generally parallel to the schistosity or the gneissic structure of the country rock.

A few small faults were seen in the gneisses of the area but the apparent displacement along their planes does not exceed a few inches. Most of the ones seen trend in a northeasterly direction.

ECONOMIC GEOLOGY

General Statement

The northern part of the map-area has been the site of considerable prospecting activity since the discoveries of 1949 and 1950 in the Queylus area

to the north (1). This activity has resulted in the staking of most of the north-western corner of the area and in the discovery of an important gold deposit close to the west shore of Norhart lake.

A good number of generally small mineralized zones were seen during the summer of 1951, most of which are characterized by intense carbonatization and some silicification of the rock, together with a dissemination of pyrite and of a few copper-bearing minerals.

Large carbonate zones are abundant in the sheared hornblende paragneisses on the shores of Mannard lake, and pyrite is commonly associated with the carbonate. Malachite and chalcopyrite occur together with pyrite, carbonate and quartz on rock exposures along the sandy beaches of the north shore of the lake, and pyrite concentrations were seen on, and just inland from, the west shore of the southern part of the same lake.

Pyrite, both massive and disseminated, was also observed along the shores of Nemenjiche lake and of the small lake to the southwest. The pyrite is in carbonatized and silicified paragneiss.

A number of companies and individual prospectors were working in the northern part of the area at the time of the writer's investigation. The most active companies were Chibougamau Explorers Ltd., Noranda Mines Ltd., and Con-west Exploration Co. Ltd.

Description of Properties

Chibougamau Explorers Ltd. (1)*

This company was formed in the fall of 1950 to examine and develop a group of 20 claims staked by H.W. Norrie and W. Lipsett in the southwestern corner of La Dauversière township. These claims are numbered C.43777, cl. 1 to 5; C.43778, cl. 1 to 5; C.43779, cl. 1 to 5; and C.43780, cl. 1 to 5. The original showing (No. 1) of the property is located in claim C.43778, cl. 2, and consists of narrow, quartz-filled, cross fractures in schistose gabbro and diorite which were found to carry interesting gold values.

During the winter of 1950-51, the company optioned and later purchased the Austman Syndicate group of 15 claims located in the northwestern corner of Rohault township and adjacent on the south to the ones it already owned. These claims are numbered C.43794, cl. 1 to 5; C.43795, cl. 1 to 5; and C.43796, cl. 1 to 5. A camp was set up on the west shore of Norhart lake, 23 miles south of the Caché Lake air-base and about 10 miles southwest of mile-post No. 118 of the St-Félicien-Chibougamau highway.

Following surface trenching and sampling of showing No. 3, in claim C.43796, cl. 1, in Rohault township, and an electrical geophysical survey, a systematic diamond-drilling programme was laid out and started in April, 1951.

(1) IMBAULT, P.E., op. cit.

*Numbers in brackets correspond to showings on the accompanying map.

Twenty-five drill holes, totalling 10,635 feet, were put down on the property up to September 9, 1951, three of which are on showing No. 1 and the others on showing No. 3. These last twenty-two holes, spaced at 50-foot intervals, have outlined a shear zone in altered basalt varying in width from 8 to 40 feet and containing quartz lenses and stringers with pyrite, pyrrhotite, chalcopyrite, and gold. The zone strikes N.80°W. and dips close to 78° to the south. The basalt is intruded by numerous, altered, syenite and diorite dykes, and the zone material, together with the wall rock, is cut here and there by narrow, massive and fresh, black lamprophyre dykes, generally trending close to northeast.

The zone has been explored for nearly 1,000 feet and is still open at both ends.

The deepest drill intersection of the vein zone is at a vertical depth of 600 feet. The tonnage indicated to this depth is about 697,500 tons with an average cut grade placed at 0.354 oz. gold and 0.70 per cent copper per ton, giving a combined value of about \$15.88 per ton.

Following financial arrangements, the company has laid down plans for further drilling to be followed by shaft sinking, and for the transfer to the property of the 300-ton mill and equipment recently purchased from West Malartic Mines, Limited.

The proposed new drilling programme is designed to test ore conditions on a 100-foot grid pattern to a vertical depth of 500 feet. This will be followed by a 200-foot grid pattern to a vertical depth of 1,000 feet. This programme should be completed in February, 1952. It is planned to commence shaft sinking immediately after and the objective of the management is to prove sufficient ore to warrant consideration of a 1,000-ton mill. It is believed that the capacity of the recently purchased 300-ton mill can be easily increased to 1,000 tons per day.

Mr. R. Storen was in charge of the field work at the time of the writer's visit, and Dr. S.E. Malouf is consulting geologist for the company.

Noranda Mines Ltd. (2)

This company holds a group of 30 claims straddling the La Dauversière-Rohault township line, about one and a half miles east of the ground of Chibougamau Explorers Ltd. The claims are numbered C.43785, cl. 1 to 5; C.43786, cl. 1 to 5; C.43787, cl. 1 to 5; C.42929, cl. 1 to 5; C.42930, cl. 1 to 5; and C.42931, cl. 1 to 5.

The rocks underlying the property consist of schistose basalts intruded by massive to schistose diorite and gabbro. A persistent strong shear zone, trending about N.35°E., crosses the northern part of the property.

Although a close magnetometer geophysical survey of the property was made during the summer of 1951, most of the detailed exploration and all the trenching have so far been concentrated in the northern part of the property. The main trenching was done on claims C.43785, cl. 1 and 4, located, respectively,

south and north of the middle one of the three small lakes lying about 3,500 feet north of mile post No. 4 of the La Dauversière-Rohault township line.

Four trenches, trending between N.5°E. and N.25°E., have been excavated from 150 to 450 feet north of the lake referred to above, in the southern part of claim 1, C.43785. The southernmost trench is 60 feet long and 8 feet wide, and shows slightly fractured but otherwise massive, medium-grained gabbro containing disseminated pyrite and small, white quartz lenses and stringers. One hundred feet farther to the northwest along a picket line there is another trench, trending N.5°E., which is 75 feet long and has a maximum width of 45 feet. Along its southern end about 10 feet of medium-grained gabbro is exposed, followed to the north by sheared greenstone, possibly of intrusive origin, and a vein of white quartz, 15 feet long and 4 feet wide, accompanied by a swarm of small lenses of quartz up to one foot long and arranged, together with the large vein, parallel to the shearing which trends N.65°W. and dips 75°N.E. The quartz is sparsely mineralized with pyrite, and a grab sample of it, taken by the writer, assayed 0.271 oz. of gold per ton. The other two trenches are in boulder clay.

South of the small lake, in the northeastern part of claim 4, C.43785, a picket line, trending S.30°W., has been cut to follow another shear zone, and about 20 trenches have been excavated to explore the shear.

The largest of these trenches, located close to the northern boundary of claim 4, C.43785, is 310 feet long and trends N.60°W. It exposes slightly schistose to much sheared, basic to intermediate lava intruded by masses of medium- to fine-grained gabbro. The shear zone is here about 60 feet wide and contains scattered pyrite and chalcopyrite with a little gold. About 200 feet farther to the southwest, another trench, parallel to, but slightly shorter than, the one mentioned above, exposes about 150 feet of sheared greenstone, apparently of volcanic origin, somewhat carbonatized and containing small quartz veins. About two feet of this shear is much mineralized with pyrite and is reported to carry up to half an ounce of gold per ton. A sample of this section of the shear taken by the writer yielded only low values.

In the numerous other trenches towards the southwest in which the main shear zone is exposed, the pyrite mineralization is very scattered and the metal values low.

Conwest Exploration Co. Ltd.

The property of this company, staked by A. Meston, consists of a group of 20 claims in Gamache township, the eastern boundary of the group being about 800 feet within the limits of the map-area. As the main showing is barely 800 feet west of the western boundary of the present area, it seems advisable to describe it here.

The claims are numbered C.45392, cl. 1 to 5; C.45390, cl. 1 to 5; G.3022, cl. 1 to 5, and G.3023, cl. 1 to 5. The property is joined to Norhart lake by a tractor road slightly over three miles long, most of which is shown on the accompanying map. The company's camp is located on the northeast shore of Meston lake, just off the western boundary of the map-area.

The main showing of the property is on a small point on the north shore of the lake, in claim 4, C.45390. It consists of medium- to coarse-grained, altered sericite granite exposed by a trench, 75 feet long and 15 feet wide, trending N.35°E. The granite contains three sets of fractures trending, respectively, N.80°W., N.45°E. and north-south. Quartz-tourmaline veins, with some pyrite and a little visible gold, fill the fractures. The gold seems to occur more commonly in association with the tourmaline but it has also been found in the milky quartz. Fine pyrite is also scattered in the granite.

Ten short exploratory drill holes were put down on the main showing of the property by Harricana Gold Mines Inc. which took an option on the group in the spring of 1951. The holes were fanned out from the mineralized exposure of granite on the shore of Meston lake. Despite the irregular distribution of the gold in the rock and the fractured nature of the granite, the results were satisfactory and the company is planning to drill from the frozen lake during the winter months.

Recommendations

The eastern part of the zone of Keewatin-type rocks of the area should be investigated carefully. Numerous small quartz-carbonate veins, many of them mineralized with pyrite, were seen in that part of the area.

The paragneisses in the vicinity of Mannard and Nemenjiche lakes and of the region west and southwest of the latter lake also deserve careful examination. The presence of large amounts of mineralized carbonate and quartz in these rocks indicates that hydrothermal solutions were as active in some of the paragneisses as in the greenstones of the northern part of the area.