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DEPARTMENT OF MINES AND RESOURCES
MINES AND GEOLOGY BRANCH

GEOLOGICAL SURVEY

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LACORNE MAP-AREA, ABITIBI COUNTY, QUEBEC

(REPORT AND MAP)

BY

L. P. TREMBLAY

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Paper 46-13

LACORNE MAP-AREA,

ABITIBI COUNTY,

QUEBEC

(Summary Account)

By

L.P. Tremblay

O T T A W A, 1946

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Illustration

Preliminary map - Lacorne, Abitibi county, Quebec.

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Lacorne Map-area, Abitibi County, Quebec

INTRODUCTION

This report presents a summary of field work in 1945 in the Lacorne map-area (longitude 77°45' to 78°, latitude 48°15' to 48°30'), the west half of the area of the Fiedmont map[1]. The original

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1 Geol. Surv., Canada, Map 206A, Fiedmont, Abitibi county, Quebec.

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mapping was done by James and Mawdsley in 1926, when the area was less readily accessible than at present. In more recent years 2,362,754 pounds of molybdenite has been produced at the Lacorne property of the Molybdenite Corporation of Canada, and spodumene (tantalite, beryl) pegmatite dykes have been discovered in several places in Lacorne township. The prospect of commercial production of spodumene from the district, and a need for clarification of the early Precambrian structure and stratigraphy of this part of Abitibi county, because of their importance in connection with the search for gold and base metal deposits, provide the incentives for remapping the area.

Outcrops were mapped in the field on air photographs, which are on a scale of about 1 inch to 1,200 feet. The base map is a two to one enlargement of the northwest quarter of the Senneterre 2-mile sheet of the Topographical Survey of Canada, and has, consequently, not the same order of accuracy as the standard 1-mile base.

GEOLOGY

The general distribution of the rocks and their relative ages are shown on the accompanying map.

A belt of Kewagama sedimentary rocks, mapped recently across the adjoining La Motte map-area[2], splits into two branches in passing

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2 Norman, G.W.H.: La Motte Map-Area; Geol. Surv., Paper 44-9.

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eastward, and the two branches have been partly traced in Lacorne area. The northern branch has been traced to the east for about 5 miles. The other, due to a swing in the structure west of the Lacorne map-area, trends southward along the southwestern border.

A third belt of sedimentary rocks, which may be of Kewagama or later age, trends a little east of south across a part of the northeastern corner of the map-area. This belt has at its base a conglomerate containing numerous fragments of rhyolite porphyry similar to that exposed farther west. The boulders suggest an unconformity beneath the conglomerate, which might, therefore, be of Timiskaming age.

Rocks of the Malartic group are associated in most places with the Kewagama sediments. In general they are altered to hornblende schists or amphibolite. The group strongly resembles that part of the Kinojevis lavas distributed along the northern margin of the granite batholith. Both are composed of hornblende schists, and to the eye they look very much the same, thereby suggesting a common origin and age for both groups.

The intrusive rocks of the map-area cover nearly all of Lacorne township. They vary in origin and character, and may be arranged according to age, beginning with the oldest, as follows:

(1) Peridotite, intrusive amphibolite, quartz porphyry (includes acidic flows and breccias), albitite dykes

(2) Amphibolite, diorite, monzonite, syenite, granite, and pegmatite

(3) Diabase dykes

Peridotite occurs as lens-like sills within the Kinojevis group close to its contact with the large body of granitic rocks, and also as a small band in the southwestern corner of the map-area. This band is probably the continuation of a large mass of peridotite that occurs between the two Kewagama sedimentary belts of La Motte map-area. The rock is generally massive, weathers light brown, mauve, grey, or green, and, due to its high serpentine content, is softer than the rocks of the Kinojevis and Malartic groups.

Intrusive amphibolite has been noted only within the Kinojevis group, where it forms sills or irregular masses cutting across the structure. It is believed to be derived from a gabbro. Only one mass has been mapped, the other bodies being either too small or doubtfully intrusive. The rock is coarse-grained and massive, very similar to massive andesitic flows, and in places is difficult to distinguish from the lava.

Quartz porphyry and rhyolite porphyry form a belt 2,000 to 5,000 feet wide in ranges II and III, Landrienne township. This belt may be a continuation of one of acidic volcanic rocks and quartz porphyry that extends northwestward across the Amos map-area. The rocks are in part massive and in part highly schistose, and their contacts with other rocks are in many places strongly carbonatized. Pyrite is disseminated throughout the schistose parts and at places is concentrated in definite zones. The porphyries vary from white to light grey on weathered surfaces, the schistose parts being white and the massive parts grey. The phenocrysts are either of quartz or of quartz and feldspars. Some bands of rhyolite and masses of acidic agglomerate or breccia are associated with the quartz porphyry.

Albitite dykes, about 4 feet wide, cut the Kinojevis volcanic rocks on the Randall and Fisher properties.

It is possible that the plutonic group (amphibolite to granite) represents different stages in the differentiation of a common magma. The group covers almost all of Lacorne township. It is characterized by a core of muscovite granite, an outer, irregular zone of biotite granite, and an intermediate zone of binary (biotite-muscovite) granite. The binary granite mass is partly surrounded by a body of biotite-hornblende granite and hornblende syenite that grades at places to a hornblende monzonite or to a dioritic rock. At a few places the diorite grades into an amphibolite. This arrangement is not always uniform in the field, as can be seen on the map.

Pegmatite dykes and quartz pegmatitic veins abound in the muscovite granite, particularly near its north and south contacts where they constitute the bulk of the exposed rock. They are also abundant in the western part of the intervening area, and are of common occurrence in a wide zone surrounding the muscovite granite. The main direction of strike of these dykes is about east. Northerly strikes are common, however, in the eastern part of the pegmatite area, northwesterly strikes in the western part, and others between these directions are also encountered. A few others strike about 40 degrees east of north. The easterly trending dykes commonly show good banding.

and are then rarely mineralized. Those trending north or northwest are of uniform grain, in general show no banding, and quite commonly contain some minerals of economic interest. Generally, those dykes striking either north or east are best mineralized when they encounter a favourable structure, such as an embayment along the granite contact, where fracturing has occurred and allowed precipitation of minerals from the pegmatitic solutions.

The quartz-diabase dykes are the youngest rocks in the map-area, and mantain a remarkably persistent and continuous northeast trend.

STRUCTURAL FEATURES

The general structural trend of the formations is between north 70 degrees east and east in the northern part of the map-area, and more nearly southward in the southwestern part.

In the northeastern corner of the area, on the old Fisher and Randall mines, a few small shear zones have been noted, but as the information available from the outcrops is scanty, it would be hazardous to draw any conclusion on the value of these as major or minor features. Nevertheless, their high content of quartz stringers, their close connection in the field with the albitite dykes, and the intense carbonatization of the country rocks in that part of the area suggest that these shear zones may be of more than minor structural importance. Intense prospecting should reveal something of their value, and at the same time facilitate an assessment of the possibilities for ore deposits. At one place in the northeastern corner of the area, where some shearing was observed, a zone of carbonate rock has been formed, and is mapped as such.

The presence of a crushed granite on lot 59, rge. I, Landrienne tp. may suggest the eastward extension of the Manneville fault observed in Figuery township south of Lake Figuery[1]. But, again, the scarcity of

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1 Norman, G.W.H.: Op. cit.

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outcrops, due to the thick cover of sand in that part of the area, does not permit any definite conclusions.

MINERAL DEPOSITS

Definite relations exist between the moybdenite-bearing, pegmatitic quartz veins, the spodumene-bearing pegmatites, and the beryl-bearing pegmatites. All these veins or pegmatites are closely related in space to granitic masses. Their occurrence in the field in incomplete concentric zones around and in the granitic batholith suggests a zoning, with beryl in the centre, molybdenite at the outside, and spodumene in between.

Molybdenite occurs in two belts in the map-area. A northwest-trending belt lies close to the western contacts of the biotite and muscovite granites with the biotite schist, but mainly within the schist. This band appears to be the eastern extension of the belt described by Norman as occurring along the southern margin of the granitic mass in Preissac and La Motte townships[2] and contains workable deposits of

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2 Norman, G.W.H.: Op. cit.

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molybdenite at the Lacorne property of the Molybdenite Corporation of Canada. The molybdenite-bearing veins in this belt are found either in the schist or in the small granitic masses, but always in close relation with these masses of granitic rocks. The other belt trends easterly along the northern contact of the large granitic mass with the volcanic rocks of the Kinojevis group. There the veins are found within the volcanic rocks. In both belts molybdenite occurs generally in very small amounts, except at the Lacorne mine.

Between and adjacent to the two molybdenite belts are two belts of spodumene-bearing pegmatites. Those in the northwest-trending belt are mainly within biotite granite or dioritic rock along the western contact of the muscovite granite. In the other, or easterly trending belt, they are found in lava, biotite schist, and granitic rock. At places the concentration of spodumene is quite high, and more intensive prospecting should reveal large reserves of the mineral in these two zones.

Beryl-bearing pegmatites are widespread within the core area of the molybdenite and spodumene-bearing zones. At no place has beryl been found in valuable concentration, but it has been noted in many pegmatites within the muscovite granite and in some outside of the granite mass but adjacent to it. Again, more prospecting may reveal interesting showings.

Spodumene Deposits

An important occurrence of spodumene has been trenched at seven different places on lot 11, rge. II, Lacorne tp. The mineral is in dykes of pegmatite cutting a small mass of biotite granite that is here about a mile wide, in an east-west direction, and is bordered by a band of biotite schist on the west and by a large mass of hornblende granitic rock on the east. At least four dykes of some importance, in addition to a number of smaller ones, have been observed. They all strike between north and north 30 degrees west, and dip steeply west. The most important dyke, traceable for about 1,000 feet, has a width varying from 5 to 18 feet, contains an average of about 20 per cent spodumene, and is of remarkably uniform mineral composition throughout. At its most southern exposure the dyke has a width of 18 feet, but is then lost for a distance of 350 feet. When noted again it appears to have split into two branches, each 5 feet wide and converging southward. The eastern branch seems to be the more important, as it can be traced for almost 650 feet farther north. This branch reaches a width of 18 feet at its northern end. The western branch appears to die out as it is followed north. Three hundred feet east of the big dyke, a 3-foot dyke was observed, and 100 feet west of it a dyke varying in width from 4 to 6 feet has been traced, and seems to be of some importance as it carries an average of about 20 per cent spodumene. All these dykes consist of quartz, feldspars (microcline and oligoclase), and green spodumene, with some lithium-bearing muscovite, beryl, and tantalite. In all of them, the amount of spodumene is persistent along the strike, and the spodumene itself occurs in large crystals mainly concentrated in areas of quartz-feldspar graphic intergrowth, and oriented about normal to the walls of the dyke. Large lenses of feldspar interrupt the uniformity of the intergrowth. From a point about 400 feet west of the place where the big dyke splits into two branches another dyke has been traced for about 750 feet southward. At its northern end it is about 4 feet wide, but 500 feet farther south the width has increased to 18 feet. Beyond this point no contacts were exposed. The concentration of spodumene in this dyke is much more variable along strike than it is in the others, and the grain is also finer.

Two spodumene-bearing dykes are exposed on lot 59, rge. IX, Lacorne tp., about half a mile south of Lake Roy. They are in contact partly with a biotite-hornblende granitic rock and partly with large inclusions of biotite schist. One of these dykes strikes south 75 degrees east, dips about 70 degrees south, and has a width varying from 19 feet at the east end to 12 feet at the west end. The contacts are sharp, and the dyke is bordered on both sides by a thin layer of white feldspar. No banding was noted. An important feature is the presence of long (at least 3 feet long in some places) lenses of pure plagioclase feldspar forming large crystals in a groundmass of finely intergrown quartz and feldspar. Green spodumene, tantalite, and beryl are the economic minerals noted, with spodumene by far the most abundant. It occurs mainly as crystals as much as 4 inches long, all oriented about normal to the strike of the dyke, but is generally also well mixed with the quartz-feldspar intergrowth. Beryl and tantalite are in very small amount, whereas spodumene may represent as much as 28 per cent of the dyke, but at places forms as little as 15 per cent. The other dyke strikes north, stands nearly vertically, and is about 18 feet wide. Its mineral composition is not uniform throughout. This dyke is much finer grained than the other, and spodumene is concentrated in patches.

It has been reported that an important occurrence of a buff-coloured spodumene has been lately discovered about half a mile south of Lake Lortie, Lacorne township. As usual, the spodumene occurs in pegmatite, but apparently in smaller grains than in the other dykes, and is buff coloured instead of green. Quoting D. R. Derry[1]: "Outcrops

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1 The writer wishes to express his thanks to Dr. Derry for the data and maps regarding the spodumene occurrences of Lacorne township that were placed at his disposal.

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examined at intervals for 350 feet south from" the north contact of the pegmatitic material with andesite "all showed the spodumene-pegmatite with a spodumene content varying from 10 to 35 per cent". He seems to believe, however, that the 350 feet is not solid spodumene pegmatite, but consists of pegmatite dykes alternating with bands of lava.

Small dykes of pegmatite cut hornblende monzonite in a small outcrop on lot 60, rge. IX, La Motte tp. Within a distance of 100 feet in a north-south direction, at least six dykes, varying in width from 2 to 4 feet, were noted with spodumene and some beryl and tantalite. They strike between west and 30 degrees west of north. Spodumene occurs in small grains, generally concentrated in an intergrowth of quartz and feldspars. Its content appears to be small, but the fine grain may give an incorrect impression.

Molybdenite Deposits

A trench has been excavated on a molybdenite occurrence in lot 58, rge. IX, Lacorne tp. The showing is at the southwestern end of Lake Roy, on the Sullivan claims. There a molybdenite-bearing dyke occurs in a narrow band of volcanic rock, now transformed to a hornblende schist, separating two lens-like sills of peridotite that trend east-west. The band of schist appears to be cut on the east by a small mass of granitic rock. The pegmatite dyke cuts across the schistosity of the

hornblende schist, and varies in width from 4 to 13 feet. It has been traced for about 200 feet on a strike of about south 35 degrees east, and dips steeply. The dyke is narrow at its eastern end, but gradually widens towards the west until it reaches the southern contact of the northern peridotite sill, where it seems to die out or to divide into many small, unimportant stringers that follow the contact. This dyke consists of quartz, feldspars (microcline and oligoclase), mica, molybdenite, and pyrite. A banding is noted at places, and is defined by a centre core of quartz margined with a mixture of fine-grained, but not intergrown, oligoclase and quartz. Molybdenite occurs as well-formed hexagonal crystals, either concentrated in book-like patches or disseminated in individual grains in the feldspathic areas. The amount of molybdenite is not constant along the strike, but the minerals appear to be concentrated mainly in the banded parts of the dyke.