RG 089(A)

CELERON - CARQUEVILLE AREA, ABITIBI-EAST AND ABITIBI-WEST ELECTORAL DISTRICTS

Documents complémentaires

Additional Files

Licence

License

Énergie et Ressources naturelles
Québec

PROVINCE OF QUEBEC, CANADA

DEPARTMENT OF MINES

Honourable W. M. COTTINGHAM, Minister

GEOLOGICAL SURVEYS BRANCH

GEOLOGICAL REPORT 89

CÉLORON-CARQUEVILLE AREA

ABITIBI-EAST AND ABITIBI-WEST ELECTORAL DISTRICTS

by

S. H. ROSS

QUÉBEC
RÉDEMPTI PARADIS
PRINTER TO HER MAJESTY THE QUEEN

1959

TABLE OF CONTENTS

MAP AND ILLUSTRATIONS

MAP

1243 - Céloron-Carqueville Area ..... (In Pocket)

PLATES

I A. - Pillow structure. Andesitic lava exposed on a small island near the south shore of Patrie lake, Vanier township. Pillows dip 56° to the south.

I B. - Intrusion breccia. Diabase dyke cutting fine-grained diorite and containing fragments of the latter. Diorite body in Range VI, Vanier township, Lot-line 40-41, near Range-line VI-VII.

Geological Report

on

Céloron-Carqueville Area

Abitibi-East and Abitibi-West

Electoral Districts

by

S. H. Ross

INTRODUCTION

General Statement

Céloron-Carqueville area was geologically mapped by the writer during the summer of 1951. It is situated within the clay belt of the Abitibi region, and bedrock exposures are consequently rare. The consolidated rock is all of Precambrian age. About 60 per cent of the area is underlain by Keewatin volcanic, intrusive, and sedimentary rocks and the remainder, by later intrusive rocks. A few copper prospects are present.

Location and Access

The area is bounded by longitudes 78°20' and 78°45' and by latitudes 49°00' and 49°15'. It has a total area of approximately 340 square miles and includes the western parts of Mazarin and Dalet townships in Abitibi-East electoral district, Céloron and most of Carqueville townships and the eastern parts of Vanier and Bourque townships in Abitibi-West electoral district.

Céloron-Carqueville area is not accessible by road. The southern boundary of the area is 23 miles north of Taschereau and 17 miles northeast of LaSarre, on the Canadian National Railways. Float-planes, flying from such bases as Amos or LaSarre, can be landed on Wawagosik, Plamondon, Patrie, and Fumerton lakes and on the Harricana river. Indians enter the area from the Harricana via the Gale river. Good water transportation throughout most of the area is lacking. The Wawagosik, Gale, and Octave rivers afford access to the

northwest, northeast, and southeast corners of the map-area for short distances. Most of the creeks are too shallow for canoeing and too deep for wading. Those parts of the area remote from the landing lakes may be reached by following range lines and Indian trails and portages.

Low relief, rapid surface run-off owing to the impervious nature of the clay-rich soil, and obstructions combine to cause the water level of the streams to fluctuate rapidly with rainfall. Consequently, the smaller rivers are not navigable during dry weather.

The eastern part of the area drains eastward by Gale and Octave rivers. The central and western parts are drained by Plamondon and Wawagosik rivers which flow northward and empty into the Harricana and Turgeon rivers, respectively.

Field Work

The base map of the area was compiled by the Quebec Department of Mines from township plans of the Quebec Department of Lands and Forests, and from aerial photographs of the Department of National Defence, Ottawa.

Rock exposures indicated on the accompanying map were found by pace and compass traverses spaced at half-mile intervals and located with respect to lot posts, stream intersections and other landmarks. Elevations were obtained by barometric determinations. The field map was plotted on a scale of 1/2 mile to 1 inch.

Acknowledgments

The writer was ably assisted in the field work by G.E. Thomas, geologist, and student assistants B.E. Martin, Emilien Seguin, and Alec Ross. Additional field help was given by N.M. Curtis, C.A. Chimene, and G.V. Mulcahy.

Previous Work

J.T. Wilson (1937) mapped an area extending from longitude 78°00' to 79°00' and from latitude 49°00' to 49°30'. This work is shown on the Gale River and Mistawak Lake maps at a scale of 1 inch to 2 miles. The Lower Laflamme River region, 50 miles east of the present area, was studied by Auger and Longley (1939). The purpose of this work was to locate formational contacts, examine mining prospects and run topographic surveys.

René Béland (1946) mapped the Taibi Lake area which adjoins the Lower Laflamme River area to the west. O.D. Maurice (1946) mapped the Razilly area which adjoins the Taibi Lake area to the west. The Chaste area, adjoining the Razilly area to the south, was mapped by Marcel Tiphane in 1948. Tiphane (1959) mapped the Mazarin area, which adjoins the Chaste area to the west and the Plamondon area to the east.

DESCRIPTION OF THE AREA

Topography

The Céloron-Carqueville area is part of the "clay belt" of northern Ontario and Quebec. Most of the area is a thickly-wooded plain of low relief. From this plain rise four isolated groups of bare rock hills, namely, the Peacock, Hebert, Saucer, and Disson hills. These hills trend northeasterly from the southwest corner across the central part of the area. The highest point is Plamondon hill, approximately 1,880 feet above sea-level, and rising several hundred feet above the plain in the central part of the area.

The slopes of these hills provide the larger rock outcrops and are easy to prospect. Most bedrock exposures are found along the banks of streams and the shores of lakes.

The flat plain is marked by V-shaped stream channels, lakes, swamps, and muskegs. There are also eskers, kames and other glacial deposits. The glacial debris ranges in size from fine rock flour to huge boulders and blocks. In general, the surfaces of the rocks exposed have been bevelled by glacial action.

Drainage

Four main streams drain the area: the Wawagosik, Plamondon, Gale, and Octave. The Wawagosik, with its branch Patrie creek, rises in the western part of the area near the southern boundary, and flows northward across the plain. The Plamondon rises in the Hebert hills and flows northward. It is joined near the north boundary of the area by Saucer creek from the west and Fumerton creek from the east. The headwaters of Gale river are south of the Saucer hills, in the south-central part of the area. It flows northeastward, along a tortuous route on the eastern flank of the Hebert and Peacock hills, into the Harricana river. Octave river, which crosses the southeastern corner of the area, is the outlet of Chicobi lake, 10 miles to the south. It flows eastward into the Harricana.

The area is in the youthful stage of the erosion cycle. The upper parts of the streams are all swift flowing, and have cut narrow V-shaped valleys and rocky gorges. The courses of many of the smaller streams are determined chiefly by the strike of the foliation of the underlying rocks. Lakes are rare, small and shallow.

GENERAL GEOLOGY

General Statement

Throughout most of the area exposures are widely scattered and relatively small. The southern and western quarters of the area are underlain mainly by Keewatin rocks, and the northwestern third by later granite. The Keewatin rocks are mainly andesitic to basaltic lavas with associated gabbroic to dioritic intrusive rocks. Agglomerates and tuffaceous sedimentary rocks are present locally.

The granite in the northwestern part of the area is part of a large mass lying mainly to the north of the area, between Harricana and Turgeon rivers. A syenite intrusion towards the southwestern corner of the area is part of a mass that extends some 4 miles to the south. Other minor intrusions consist of diorite and granodiorite; the latest, referred to the Keweenawan, are of diabase and gabbro.

Hybrid rocks, consisting of injection gneiss, contact breccia and diorite, occur along the contacts between the northwestern granite mass and the Keewatin volcanics.

Table of Formations

QUATERNARY	PLEISTOCENE AND RECENT	Moraine, sand and gravel, sandy clay, clay
Unconformity		
PRECAMBRIAN	KEWEENAWAN	Diabase and gabbro dykes
	POST-KEEWATIN	Biotite granite Hornblende syenite Diorite, quartz diorite, granodiorite, injection gneiss, and contact breccia
	Intrusive Contact	
	KEEWATIN	Greenstone, chlorite and hornblende schists Diorite and gabbro intrusives Andesite, basalt, agglomerate, tuff, and chert

KEEWATIN

Volcanic and Sedimentary Rocks

The Keewatin-type rocks of the area are flanked on the north and west by extensive bodies of granite, and intruded by diorite, granodiorite, and syenite. The volcanics are intimately associated with dioritic and gabbroic intrusions which, in many cases, cannot be readily distinguished from coarser facies of the lavas.

The lavas are intermediate to basic in composition and fine- to coarse-grained, and consist mainly of hornblende andesite, dacite, and basalt, in order of decreasing abundance. They vary from massive to foliated and many are banded. Adjacent to intrusions, assimilation, recrystallization, and injection have produced hybrid rocks.

The regional trend of the foliation and banding is northeasterly. In the vicinity of intrusive bodies the foliation and banding roughly parallel the contacts.

The lavas have porphyritic texture and amygdaloidal, brecciated, and ellipsoidal structures. The pillows range in size from a few inches to several feet and are commonly elongated (Plate I). They generally have a dark, epidote-rich weathered surface, dioritic interior, and a flinty margin. The pillows are composed mainly of hornblende, chlorite, feldspar, and carbonate plus small amounts of kaolinite, sericite, and epidote. Pillow structures appear to be most common in amygdaloidal and porphyritic volcanics.

The ellipsoidal lavas extend across the area in a northeasterly direction. Pillow lavas are well exposed on Plamondon hill and on Hebert and Peacock hills. Similar rocks occur on the south shore of Patrie lake and in the Disson hills, in the southwest corner of the map-area. The occurrences south of Gale lake and east of this point, in Lot 59, Range V, Céloron township, may continue from Patrie lake.

A narrow band of agglomerate is exposed 1/2 mile east of the first rapid on Gale river, in Lot 22, Range IV, Dalet township. The band strikes N.30°W. and dips 55° to the northeast. Angular fragments of andesitic and cherty material, up to 5 inches across, in a dark, tuffaceous matrix, are characteristic of this rock. Brecciated lavas, typical of the basal portions of flows, are common throughout the area. Some bands weather purple.

The sedimentary rocks consist of fine-grained acidic and basic tuffs and porcellainous, cherty beds which weather white. Andesitic and light, acidic,

splintery tuffs or feldspathic ash bands, with films of manganese dioxide on cleavage surfaces, are common in the Hebert hills and on Plamondon hill. The acidic tuffs are altered to quartz schists and quartz-sericite schists. Around Patrie lake and in the Disson hills, sheared tuffs associated with pillow lavas are talcose and resemble phyllites. Narrow bands of tuff and thin beds of chert are commonly interstratified with the lavas. Here and there they are brecciated near contacts with the lavas, and, in places, the tuffs are silicified and mineralized with sulphide.

A brecciated zone with red jasperoid fragments in what appears to be quartzite crops out on the north slope of Plamondon hill, in Range I, Carqueville township. The zone is 6 feet wide and strikes N.65°W.

Brecciated flows grade into andesitic, porphyritic, and amygdaloidal lavas. In the Plamondon hill area the gradation is from south to north, and the amygdaloidal lavas display typical flow structures. Both porphyritic and amygdaloidal lavas are commonly interbedded with thin, rusty, tuff bands. In places they have well-developed ellipsoidal structures. Both milky quartz and calcite amygdules are present and are stretched parallel to the foliation. The metamorphosed lavas have been transformed into hornblende schists.

Coarse-grained, gabbroic lavas containing large, striated cubes of pyrite outcrop on the south shore of Patrie lake. On the north shore, from east to west, coarse-grained basic lava grades into porphyritic olivine gabbro rich in iron sulphides. Phenocrysts of feldspar are clearly visible in a coarse-grained, gabbroic matrix. The basic flow is cut by banded veins of epidote and carbonate that strike S.30°E.

Coarse-grained, dioritic facies of the flows are much more common than gabbroic facies. These facies have not been separated in the mapping. They are distinguished from later intrusive diorite by the presence of flow structures and pronounced shearing.

Several bodies of amphibolite, related to the intrusive rocks described above, occur near the margins of the Keewatin rocks.

POST-KEEWATIN INTRUSIVE ROCKS

The granite underlying the northwestern part of the map-area comprises 35 per cent of the bedrock. In most places along the contact between the granite and the volcanic rocks there is a zone of hybrid rocks, including diorite, injection gneiss, and contact breccia. The Disson hills, in the southwest corner of the area, are underlain by coarse-grained, porphyritic hornblende

syenite.

Numerous dykes occur in the area, and the majority of them are small. Four large diabase dykes cut the granodiorite-diorite mass underlying the Saucer hills.

Biotite Granite

The biotite granite is coarse-grained and pink to grey. For the most part, it is massive, but is locally well foliated. It is composed of orthoclase and/or microcline and plagioclase, with 25 to 30 per cent quartz and 5 to 15 per cent biotite and hornblende. Common accessory constituents are apatite, zircon, sphene, and magnetite.

The margins of the granite are more basic than central portions. Quartz diorite occurs near the contact between the granite and the volcanics. The diorite and volcanics have been invaded by the granite and, consequently, contaminated granite, injection gneiss, and migmatite mark the contact zones. The granite is penetrated by numerous thin dykes of aplite and pegmatite.

The granite near Patrie creek in Vanier township is coarse-grained, generally massive, but locally foliated. The mass which outcrops west of Patrie creek, in Lots 43 and 44, Range IX, is a foliated hornblende-rich, biotite granite. It is penetrated by thin aplite veins and apophyses of leucocratic, microcline granite of saccharoidal texture. There are two generations of feldspar here: an earlier white, calcic (oligoclase) type and a later potash-soda (microcline) type. The foliation strikes N.40°E. and dips 75° to the east, whereas the injections strike north. The outcrop shows rounded, exfoliated surfaces, with some evidence of glacial plucking to the south.

The granite mass east of Patrie creek, in Lots 48 and 49, Range IX, is a coarse-grained, equigranular rock, containing hornblende-rich inclusions and cut by quartz veins. This rock is composed chiefly of about 10 per cent microcline, 50 per cent plagioclase, 25 per cent opalescent quartz, and 10 per cent biotite. It is in contact to the east with a body of sheared amphibolite, which may be a metamorphosed gabbro dyke. The schistosity of the amphibolite strikes N.10°E.. The amphibolite is cut by quartz veins striking northeast and containing pyrite.

Hornblende Syenite

A stock of red hornblende syenite occurs in the Disson hills on the south boundary of the map-area, between Lot 40, Vanier township, and Lot 7,

Céloron township. It is bordered to the north by a zone of hybrid rocks. The syenite is typically coarse-grained and porphyritic, with orthoclase and microcline phenocrysts up to 1 inch in size. The syenite is composed mainly of orthoclase and microcline, with hornblende and biotite in about equal amounts. Small amounts of plagioclase are generally present. The accessory constituents are apatite, sphene, and epidote. A facies similar to the syenite in composition but with larger amounts of plagioclase and pyroxene may be classed as monzonite.

The margins of the stock in contact with the zone of hybrid rocks are more basic than the central portions. A transitional series of rock types can be traced westward from the syenite through monzonite, quartz monzonite, and injection gneiss, to sheared lavas and tuffs. Veins of green epidote and red aplite are common in the hornblende syenite and monzonite of the transitional series.

Hybrid Rocks

A contact zone of hybrid rocks consisting of diorite, quartz diorite, granodiorite, and injection gneiss generally lies between the granitic rocks and the volcanics. Such a zone, with rocks grading from metamorphosed lavas and schists through injection gneiss and diorite, occurs along the intrusive contact north of the Hebert hills. A similar zone, but with monzonite and hornblendite as described above, lies between the syenite and the volcanics.

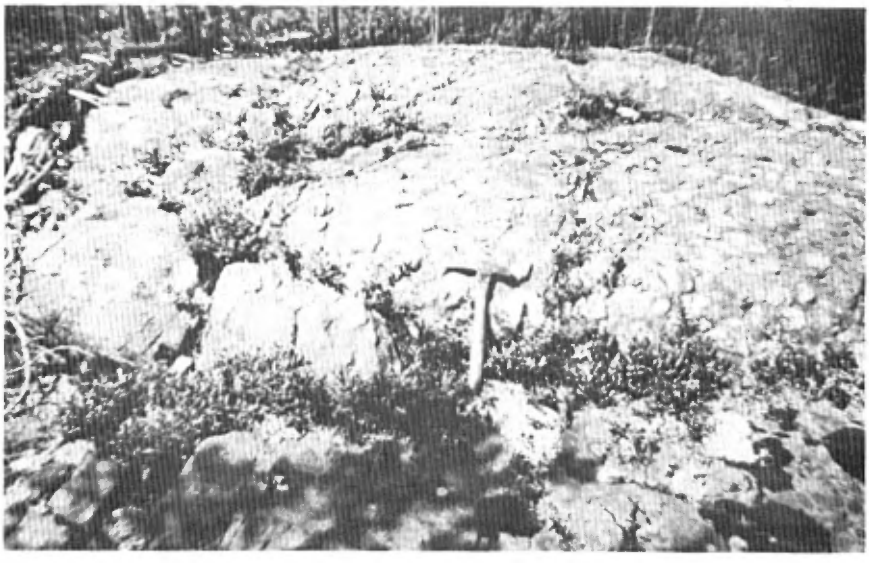
Diorite and Quartz Diorite

Diorite and quartz diorite masses of irregular shape, ranging in size from a few hundred to 1,000 feet across, cut the Keewatin volcanics near the granite contact. They are closely associated with injection gneiss, and gradational facies from one to the other are common. The diorite and quartz diorite are generally sheared and have well-developed joint patterns. The composition is essentially green hornblende, biotite, and plagioclase feldspar with up to 10 per cent quartz. Common accessories are apatite, magnetite and zircon.

Dioritic intrusions in the volcanics are generally similar in appearance to the coarse-grained andesitic flows and, therefore, they were not mapped separately from the lavas and associated sediments. Both diorite and quartz diorite are commonly cut in all directions by thin quartz veins sparsely mineralized with sulphides.

PLATE

A. - Pillow structure. Andesitic lava exposed on a small island near the south shore of Patrie lake, Vanier township. Pillows dip 56° to the south.



B. - Intrusion breccia. Diabase dyke cutting fine-grained diorite and containing fragments of the latter. Diorite body in Range VI, Vanier township, Lot-line 40-41, near Range-line VI-VII.

Granodiorite

A major intrusion of granodiorite, with basic gabbroic margins, occurs in the Saucer hills, in the central part of the map-area. It forms a prominent ridge with easterly trend. Shear zones in the diorite strike north-northeastward and contain quartz veins, thin ribs of clear quartz, and rock gouge with small amounts of chalcopyrite.

Four large diabase dykes cut the granodiorite and diorite in a north-south direction. The dykes are generally fine-grained with closely spaced shear planes trending northwesterly, and commonly filmed with pyrite. They usually display chilled margins, with some quartz veins. Sparse pyrite is present at the contacts. Numerous thin dykes of diabase, 1 to 2 feet thick, traverse the diorite. The fact that they are highly sheared and altered indicates an earlier age than the larger, more massive dykes.

Injection gneiss

Injection gneiss, generally occurs near intrusive bodies and around the boundaries of the granitic masses where they are in contact with the sheared lavas, tuffs, and diorite. The intrusive component of the injection gneiss is usually granitic, and consists mainly of quartz and feldspar, although quartz veins and dioritic injections are also common.

On Plamondon hill, along the north contact, injection gneiss has been formed by lit-par-lit injection of pink, biotite granite into porphyritic, foliated diorite, and hornblende schist derived from metamorphism of lavas. Lit-par-Lit injection may be accompanied by the growth of porphyroblastic feldspars in the schists. The contacts between granite veins and metamorphosed schists strike N.30°W. parallel to foliation, which dips 70° to the northeast. Quartz veins which cut the injection gneiss strike N.30°E. Ptygmatic folding is well developed in the injection gneiss.

Quartz veins are characteristic of the injection gneiss on the north side of Plamondon hill. The veins consist of rusty, saccharoidal quartz aggregates. At the south contact, granite injection veins average 18 inches in width. Small lenses of quartz give the rock a banded appearance.

The diorite body in Range III, west of Plamondon river, has been invaded by granitic veins near its contact with hornblende schist and metamorphosed lavas. The schists contain carbonate veins mineralized with chalcopyrite, and exhibit ptygmatic folding.

In the Disson hills, hornblende syenite has been invaded by veins rich in hornblende and epidote; hornblende schist, by hornblende granite; and monzonite, by red aplite.

South of Gale lake, injected tuffs yield quartz-sericite schists.

KEWEENAWAN

Diabase and Gabbro Dykes

Numerous thin diabase and gabbro dykes occur in the area. They are most abundant in the contact zone of hybrid rocks. In general, they trend parallel to the jointing, northeast or northwest or parallel to the foliation of the rocks they intrude. They are usually quite massive, and differ from the older dioritic and gabbroic intrusives in the absence of foliated structure. The large diabase dykes cutting the Saucer Hills granodiorite have been described above. A diabase dyke, 100 feet thick, is associated with a copper prospect in the contact zone of hybrid rocks in the Disson hills. The dyke, striking N.10°E., cuts sheared pillow lavas and interbedded cherty tuffs and breccia.

A north-south diabase dyke, cutting fine-grained diorite and enclosing fragments of diorite up to 8 inches in size, occurs in Lots 40 and 41, on Range-line VI-VII, Vanier township. The intrusion breccia associated with this dyke is shown in Plate 1B.

PLEISTOCENE and RECENT

The most recent ice sheet deposited boulder clay over most of the map-area. During the melting of the ice, glacial lake Barlow-Ojibway was formed between the ice front and the height of land to the south. The combination of deposition deltaic materials in this lake by southward-flowing streams and the northward retreat of the ice barrier formed long, sinuous, north-south ridges of sand. Such a sand ridge occurs in the western part of the area, where it extends continuously for many miles and forms a divide for the present drainage. The ridge varies in width from 1 to 3 miles and rises 100 to 200 feet above the surrounding plain. Its greatest width is in Range IV, Carqueville township. Within this sand ridge, eskers, crescent-shaped dunes of northeast and southeast convexity, and kettle-hole lakes are well developed at a number of places.

The north part of the ridge is characterized by hummocky ground and steep, east-trending sand ridges with scattered boulders of granite and metamorphosed basic volcanics. Southward, the relief decreases and sand plains with jack pine and grassy glades, dissected by small streams, are more common.

Narrow, well-developed sand dunes are common near the north edge of the sand plain, on the north flank of the Saucer hills, in Lots 18 and 19, Range VIII, Céloron township. Their leeward slopes face northeasterly. Crescent-shaped sand dunes, with their leeward slopes facing southeasterly, occur on the south edge of the sand plain, in Lots 16 to 18, Range V, Céloron township.

The plains are covered by fine-grained sand, sandy clay, and clay. Sand and gravel occur on elevated slopes, low hills, kames, and eskers.

The tops of the isolated groups of hills were not submerged in the post-glacial lake. From 1,100 to 1,550 feet above sea-level the hillsides were washed clean by the waves, except where cobble beaches formed in sheltered gullies.

Well-developed cobble beach deposits are exposed on Plamondon hill and in the Hebert and Saucer hills. The beaches trend east-northeast. Four-strand lines or old beach levels are generally present. The width of the beaches varies from 4 to 100 feet and averages 10 feet. The difference in elevation between beach levels is commonly about 5 feet. The average maximum length of the individual cobbles is approximately 10 inches.

Rock exposures occur mainly on scattered hills and ridges, on the shores of lakes, and at some places in the channels of the larger streams. Small hills and ridges, composed of sand, gravel, and boulders, are common throughout the area. Such materials are thickest on the south sides of the hills. Rock exposures, if present, are more common on the north side. The large boulders of diorite and granite on the south slope of Plamondon hill are probably derived by plucking during glaciation. Glacial erratics of granite up to 6 feet in diameter are common.

Glacial striae were observed at a number of widely separated points throughout the area. They indicate that the general direction of the most recent advance of the ice was S.30°E.

STRUCTURAL GEOLOGY

The structure of the area is complicated locally by igneous intrusions. This is especially true of the mass of Keewatin rocks which forms Plamondon hill and the Hebert hills, in the central part of the area. The secondary structures of these rocks could have resulted from compression by the granitic masses north and south of the hills. The foliation and lineation of the greenstones indicate that, generally, the maximum stress acted in this direction. The foliation and stratification of the Keewatin rocks trend northeasterly and dip steeply to the southeast. In the northeastern part of the area,

the trend of the bedding and schistosity is north. Northwestward trends, with steep northeasterly dips, accompany northeasterly trends and southeasterly dips with the intrusive. Near the contact zones and the granite, there is generally a concordant relationship between the lineation of the greenstones and intrusive contacts.

The volcanic rocks, in general, have a northeasterly trend. Well-developed and clearly-defined pillow structures in andesitic lavas can be observed at a number of widely separated places in the map-area. The best exposures are in the Peacock, Hebert, and Disson hills and around Patrie lake. Determination of the attitudes of the pillows can be made on joint planes, which are invariably present. In general, the pillows dip southward and southeastward at moderate angles. However, in the Peacock and Hebert hills, and especially on Plamondon hill, the pillows have been highly disturbed and faulted, and their complex attitudes are difficult to interpret. These conditions are believed to be related, at least in part, to tectonic effects connected with the emplacement of the granite.

In the Hebert hills, the dip of the pillows varies from south to southeast, whereas in the Peacock hills the dip is both southeast and northwest. The overall structure can be interpreted as an anticlinal axis extending northeasterly through the Peacock and Hebert hills.

Excellent exposures of pillows on the south shore of Patrie lake indicate a gradual decrease in dip southward. Patrie lake, Gale lake, and the area to the south may lie on the south limb of an anticline, the axis of which lies to the north, in the Peacock and Hebert hills.

Conjugate jointing is well developed in the volcanics. Two prominent sets strike N.50°W. and N.45°E.. Dykes commonly parallel the joints. At least two and possibly three faults, striking north or northwesterly, cut the Keewatin and post-Keewatin rocks.

A north-south fault, cutting volcanics north of Plamondon hill, is inferred by overturned pillows, abrupt change in strike of the banding and foliation, and by brecciation. Two miles north, on Range-line II-III, slickensided surfaces, striking N.10°E., cross a large body of diorite. These two occurrences may be part of the same fault. Another fault, striking N.15°E., occurs in Lot 35, on the Disson Township line, in the southwestern corner of the area. This fault cuts a wide band of sheared lavas and interbedded tuffs which trend northeast. A fault breccia zone, 3 feet wide, contains stockworks of quartz and carbonate veins with small amounts of chalcopyrite.

A fault scarp or prominent joint face, striking N.20°W., may be seen on an andesite ridge 1/2 mile south of Fumerton lake in Dalet township. This could be the south extension of the fault shown on the Gale River map (Wilson, 1937).

Minor discontinuous shear zones in Keewatin rocks, striking parallel to the banding and schistosity, are common throughout the area. Two strong shear zones occur on the east edge of the Hebert hills. The westernmost zone, striking N.25°E., is in Lot 49, on the Carqueville-Céloron Township line. This zone, consisting of contorted quartz-sericite schists, mineralized with sulphides, is about 800 feet wide. Another strong shear zone occurs in gabbro about 2 miles northeast of the above location, in Lot 58, Range-line I-II, Carqueville township. This zone, striking N.25°W., consists of hornblende schist, and brecciated quartz, mineralized with chalcopyrite and pyrrhotite.

ECONOMIC GEOLOGY

Some prospecting has been done in various parts of the area since 1940. Prospecting is made difficult by heavy overburden and scarcity of outcrops around the borders of the granite intrusions.

The most extensive exploration up to 1951 has been on the Peacock claims, in Carqueville township. The main showing is in Lot 58, Range II, where a shear zone in gabbro, which strikes N.25°W. and dips steeply to the southwest, has been explored by stripping and trenching. The country rock is hornblende schist. Chalcopyrite and pyrrhotite occur in the shear zone, in a brecciated quartz vein between 8 and 9 feet thick.

A copper prospect in the southwest corner of the area, in the middle of Lot 40, Range I, Vanier township, is near the contact between injection gneiss and pillow lavas interbedded with cherty tuff. The injection gneiss strikes N.40°E., and is cut by diabase and gabbro dykes. A diabase dyke, 100 feet thick and striking N.11°E., is flanked on the west by a highly siliceous, contorted, drag-folded, and brecciated zone, 25 to 30 feet wide. Sulphide minerals are exposed in a prospect pit 5 feet deep; they consist of pyrite and chalcopyrite concentrated in a band 2 feet wide which strikes N.65°E. and dips steeply to the southeast.

Small amounts of pyrite, chalcopyrite, and pyrrhotite, generally associated with quartz-carbonate and brecciated quartz veins in shear zones, occur at a number of places in the Keewatin and post-Keewatin hybrid rocks.

Sheared diorite in contact with lavas and tuffs is generally marked by zones of brecciation containing deformed quartz and chalcopyrite. Contorted schists commonly contain thin bands of chalcopyrite and pyrite in saccharoidal quartz veins.

Sheared pillow lavas, with carbonate bands associated with chlorite and serpentine along shear planes, commonly contain numerous quartz veins mineralized with small amounts of chalcopyrite. Coarse-grained, hornblende-rich volcanic flows carry disseminated pyrrhotite and chalcopyrite in some places.

Silicified schists and tuffs appear to contain the highest concentrations of sulphides.

APPENDIX TO GEOLOGICAL REPORT 89

ECONOMIC GEOLOGY

Mining Developments, 1951-1959

by J.-E. Gilbert

Little prospecting and exploration work appear to have been carried out in the Céloron-Carqueville area since the compilation of the field work upon which the present report is based.

Some geophysical work consisting of resistivity, of magnetometric and of electromagnetometric surveys was reported in Carqueville and Dalet townships during the last few years and a limited number of diamond drill holes were reported to have been put down.

QUEBEC, July 15, 1959.

BIBLIOGRAPHY

AUGER, P.E., and LONGLEY, W.W., (1939) Lower Laflamme River Area, Abitibi District; Que. Dep't. Mines, G.R.2.

BÉLAND, René, (1946) Taibi Lake Area, Abitibi-East County; Que. Dep't Mines, G.R. 40.

MAURICE, O.D., (1946) Razilly Map-Area, Abitibi-East County; Que. Dep't. Mines, G.R. 41.

TIPHANE, Marcel, (1959) Chaste - Mazarin Area, Que. Dept. Mines G.R. 88.

WILSON, J.T., (1938) Mistawak Map-Area, East Half, Quebec; Prel. Rep. Geol. Surv. Can., Paper 38-18.

WILSON, J.T., (1938) Mistawak Map-Area,West Half, Quebec; Prel. Rep. Geol. Surv. Can., Paper 38-19.

WILSON, J.T., (1939) Mistawak Lake, Abitibi Territory and Abitibi County, Quebec; Can. Dep't. Min. and Res., Min. and Geol. Br., Geology 1937. Map 533-A.

WILSON, J.T., (1939) Gale River, Abitibi Territory and Abitibi County, Quebec; Can. Dep't. Min. and Res., Min. and Geol. Br., Geology 1937. Map 554-A.

ALPHABETICAL INDEX