RG 027(A)

DESVAUX LAKE AREA, DASSERAT TOWNSHIP, ROUYN-NORANDA COUNTY

Documents complémentaires

Additional Files

Licence

License

Énergie et Ressources naturelles
Québec

PROVINCE OF QUEBEC, CANADA

Department of Mines

Honourable Jonathan ROBINSON, Minister — A.-O. DUFRESNE, Deputy Minister

MINERAL DEPOSITS BRANCH

BERTRAND T. DENIS, Chief

GEOLOGICAL REPORT 27

DESVAUX LAKE AREA

DASSERAT TOWNSHIP

ROUYN-NORANDA COUNTY

by

P.-E Auger

QUEBEC

RÉDEMPTI PARADIS

PRINTER TO HIS MAJESTY THE KING

1947

DESVAUX LAKE AREA

DASSERAT TOWNSHIP

ROUYN-NORANDA COUNTY

by P.-E. Auger

TABLE OF CONTENTS

MAP AND ILLUSTRATIONS

Map No.618.-Desvaux Lake Map-Area ..... (in pocket)

Plates

(After page 12)

I.-Trachytic texture in rhyolite; northeast of Dasserat lake.

II.-Brecciated quartz grains in agglomerate; south of dam between Desvaux and Ogima lakes.

III.-Contact between quartz diorite and rhyolite; northeast of Dasserat lake.

IV.-Zoned microcline in syenite porphyry; along telephone line north of Renault camps.

V.-Pillow lava south of northern synclinal axis; on south shore of island in Desvaux, looking north.

VI.-Granite pebble, cut by quartz veins and aplite dykes, in conglomerate of Cobalt series.

VII.-Smooth surface of Cobalt-Keewatin contact (Cobalt on top); west of Ogima lake.

VIII.-Cobalt-Keewatin contact; point of hammer is on north slope of pre-Cobalt ridge.

IX.-Clay falls, 300 feet below dam between Desvaux and Ogima lakes.

DESVAUX LAKE AREA

DASSERAT TOWNSHIP

Rouyn-Noranda County

By P.E. Auger

INTRODUCTION

General Statement

The writer spent the field season of 1941 making a detailed geological survey of part of the southeastern quarter of the township of Dasserat, in Rouyn-Noranda county. The area adjoins on the west the Fortune Lake map-area, examined in 1937 by G.S. MacKenzie (1).

The present work is part of a programme which will continue the mapping across the western half of Dasserat township to the Quebec-Ontario boundary. When this programme is completed, there will be a continuous series of detailed geological maps covering the 'gold belt' from Rouyn to Larder Lake, Ontario.

Location, Access, and Character of Area

The northeastern corner of the map-area is about fifteen miles west and three miles south of the town of Rouyn. The western limit is five miles from the Quebec-Ontario boundary. From the centre of the township of Dasserat, the map-area extends eastward for a distance of three and a half miles and southward for a distance of two miles. Its northern limit is 3,500 feet north of the east-west centre-line of the township. The total area covered by the map-sheet is about nine square miles.

The area is accessible by canoe or motor-boat from Kanasuta, a station on the Nipissing Central railway. The route leads northward across Desvaux lake to Dasserat lake through Snake creek, which is easily navigable but very meandering. This is part of the formerly well-travelled route from lake Témiscamingue to lake Abitibi. Dasserat and Desvaux lakes are popular summer resorts for residents of the Rouyn district, who have built cottages on several of the islands that dot their waters.

The northern part of the map-area is flat. In the central part, a series of low hills of quartz diorite extend eastward from Dasserat lake to the Fortune Lake area. In the southwest quarter, the Swinging hills, composed of rocks of the Cobalt series, rise to a height of about 1,600 feet above sea level and on the south are separated by a valley

---

(1) MacKenzie, G.S., Fortune Lake and Wasa Lake Map-Areas; Que. Bur. Mines, Geol. Rept. No.5, 1940.

from a long ridge, of similar rocks and of about the same height, which extends westward beyond the Quebec-Ontario boundary. These ridges are regarded by Cooke (1) as representing the remnants of an old peneplain which was eroded down to its present level during and after successive elevations of the region. West of Dasserat lake is a similar ridge with northeasterly trend.

Most of the district has been burned over several times, and almost everywhere re-growth is heavy. In a few valleys only some cedar and spruce of good size have been preserved.

Drainage and Effect of Glaciation

The southern part of the map-area is very close to the height-of-land separating the Ottawa River and Hudson Bay basins. The height-of-land here owes its position to the accumulation of glacial drift between Summit lake and the northward draining Ogima lake, at the northern end of Opasatika lake. There was formerly a difference of 37 feet between the altitude of the two lakes, Ogima lake being higher. At the time Cooke was carrying on his geological investigation of the district, in 1922, erosion had gradually cut down this dam of drift and, during times of high water, a temporary stream was flowing southward toward Summit lake. Since that time, natural erosion, helped by human agencies, has diverted the water of Ogima lake toward the south and completely drained this lake. Dams were constructed to prevent the water of Desvaux and Dasserat lakes from draining into Ogima lake and southward to Opasatika lake. At present, a new dam is being built at the southern outlet of Ogima lake to restore it to its original level and probably raise the level of Dasserat and Desvaux lakes.

Bibliography

Numerous geologists have worked in this and adjoining districts. The reports listed below contain data relating to the present map-area.

Wilson, M.E., Geol. Surv. Can., Sum. Repts., 1908, 1909, 1910, and 1911; Mems. 4, 17, 39 and 103.

Cooke, H.C., Opasatika Map-Area, Timiskaming County, Quebec; Geol. Surv. Can., Sum. Rept., 1922, Part D, pp.19-74; Mem.131.

James, W.F., Duparquet Map-Area, Quebec; Geol. Surv. Can., Sum. Rept., 1922, Part D, pp.75-96.

Cooke, H.C., Some Gold Deposits of Western Quebec; Geol. Surv. Can., Sum. Rept., 1923, Part CI, p.76.

Cooke, H.C., Gold and Copper Deposits of Western Quebec; Geol. Surv. Can., Sum. Rept., 1925, Part C.

---

(1) Cooke, H.C., Opasatika Map-Area, Timiskaming County, Quebec; Geol. Surv. Can., Sum. Rept., 1922, Part D, pp.61-2.

Gunning, H.C., Syenite Porphyry of Boischatel Township, Quebec; Geol. Surv. Can., Bull. 46, 1927, pp.31-41.

Bruce, E.L., Arntfield-Aldermac Mines Map-Area, Beauchastel Township; Que. Bur. Mines, Ann. Rept., Part C, 1932, pp.29-87.

Cooke, H.C., James, W.F., and Mawdsley, J.B., Geology and Ore Deposits of Rouyn-Harricanaw Region; Geol. Surv. Can., Mem.166, 1932.

MacKenzie, G.S., Fortune Lake and Wasa Lake Map-Areas; Que. Bur. Mines, Geol. Rept. No.5, 1940.

Methods of Work

The present map-area is not divided into ranges and lots. The only base-lines available are the two centre-lines of the township and a few surveyed claims. Rock outcrops indicated on aerial photographs were mapped by plane-table wherever this method could be used. Where vegetation was dense, they were located by chain and compass or pace and compass from points on surveyed traverses or lines.

Acknowledgments

The writer wishes to express his appreciation of the courtesies extended him by Mr. Auguste Renault, one of the pioneers of prospecting in northern Quebec and Ontario, and also by the fire rangers, Messrs. Major and Arsenault.

Efficient and conscientious service was rendered by H.F. Belding, of the University of Toronto, as senior assistant, and by F. Grenier, of l'Ecole Polytechnique, Montreal, as junior assistant.

GENERAL GEOLOGY

The general geology of Desvaux Lake map-area is very similar to that of neighbouring regions in Quebec and Ontario.

The formations are Precambrian in age, apart from the Quaternary and Recent deposits which overlie all the consolidated rocks in the less elevated parts of the region. The rock outcrops may be subdivided into two principal groups, based on their age. The older group comprises a complex of volcanic rocks, acidic and basic, which have been intruded by numerous dykes and stocks of various types but mostly acidic. The younger group is represented by Huronian sediments of the Cobalt series. These are almost flat-lying beds of argillite, greywacke, and conglomerate resting unconformably on the older group. That this unconformity represents a great lapse of time is evident, since the once deeply buried volcanic formations and intrusive rocks were uncovered and heavily eroded before the Cobalt sediments were deposited on their surface. It is estimated that the thickness of rock removed during this long period of erosion was at least 14,000 feet and may have reached a

maximum of over 30,000 feet (1). It is also believed that the pre-Cobalt surface was peneplaned and glaciated, and that the Cobalt sediments are of glacial origin.

Table of Formations

Pleistocene and Recent			Boulders, gravel, sand, stratified clay, boulder clay
Late-Precambrian			Quartz diabase
Precambrian	Huronian	Cobalt Series	Conglomerate, greywacke, arkose, argillite
	Great unconformity		
	Pre-Huronian	Intrusive Rocks	Rhyolite porphyry and aplite porphyry Syenite porphyry Pyroxenite and lamprophyre Diorite porphyry Quartz diorite
		Intrusive contact	
		Volcanic Rocks (Keewatin-type)	Agglomerate Acidic volcanic fragmental rocks and fine tuffs Basic volcanic fragmental rocks Trachyte Rhyolite:porphyritic, pillowed, and amygdaloidal Sericite schist Andesite: pillowed and amygdaloidal Diorite and basalt Chlorite schist

(1) H.C. Cooke, Larder Lake District; Geol. Surv. Can., Mem. 131, 1922, p.38.

Keewatin-Type Volcanic Rocks

The Keewatin-type rocks of the area are all volcanics, with rhyolite and other acidic types the most abundant.

Andesite, Diorite, Basalt, Chlorite Schist

The largest and most numerous outcrops of intermediate to basic volcanics are to be found along the southern border of the map-area, between the western shore of Ogima lake and the contact with the sediments of the Cobalt series, but they are exposed also at many places east of Ogima lake and along the shore of Desvaux lake. In these occurrences, the rock is andesite and chlorite schist with good pillow structure and a very pronounced schistosity. In thin section, it appears very highly altered, with development of large amounts of secondary chlorite. Between Ogima lake and Desvaux lake, there is a band of similar but slightly sheared andesite which is folded into a V-shape with the point of the V facing westward. The width of the band is approximately 500 feet along the branches of the V and about 1,000 feet at the apex. The rock is amygdaloidal and structures such as ellipsoids, flow lines, and flow contacts are well developed.

Between the limbs of this V-shaped band, and also to north and south of them, the rocks are acidic volcanics also forming a V-shaped band 500 to 1,000 feet wide. This band of acidic lava is itself limited on the north and on the south by basic lavas. On the north, these basic lavas include a narrow band of massive, thin-bedded, pillowed andesite, of which, however, there are but few exposures. There are sparse outcrops of andesite also at the southeastern extremity of Dasserat lake. Here the rock is interbedded with acidic flows and volcanic breccia, and all are cut by numerous dykes of porphyry. In the northwestern corner of the map-area, on a point on the west shore of Dasserat lake that juts out a little beyond the north-south centre-line of the township, pillowed andesite, very poorly exposed and usually accompanied by coarse diorite, is interbedded with acidic flows.

Quartz diorite is of very common occurrence within the map-area. In most places, it appears as definite dykes intruding the volcanics, but it also occurs as sill-like bodies, some at least of which may be interbedded lava flows. For this reason, it is mentioned here with the volcanic formations but it will be described more fully in a later section, with the intrusive rocks. On the accompanying map, it is indicated as intrusive. The best example of quartz diorite with volcanic features is to be seen on mining claim R-29155, on the western shore of Desvaux lake. At this locality, numerous large sill-like bodies of the diorite lying within acid volcanics have a narrow chilled margin at the base and are brecciated at the top. These features strongly suggest that they are interbedded volcanic flows of dacitic composition.

There are a few outcrops of basaltic volcanic rock on the west shore of Desvaux lake, but their size and number are so small that they are not shown on the accompanying map.

Where the volcanics of intermediate to basic composition have been subjected to intense shearing, they are quite commonly converted to chlorite schist. These are prominent, for example, in the pillow lavas along the southern synclinal axis near the Cobalt formations west of Ogima lake.

Rhyolite, Trachyte, and Sericite Schist

Rhyolite underlies most of the northern part of the area, from the eastern to the western boundary. It crops out along the major part of the northern shore of Dasserat lake and on several of the islands in the lake. The rhyolite is easily distinguished from all other volcanic or sedimentary formations of the map-area. It is a fine grained rock, very hard and massive, which breaks with a conchoidal fracture. It has a greenish-grey colour, this particular shade varying according to the abundance of epidote-rich amygdules and of phenocrysts, which are one of the most characteristic features of the rock. These are, in part, almost microscopic, but most of them are easily visible to the naked eye and some have diameters up to 5 mm. Under the microscope, some of the phenocrysts are found to be euhedral crystals of feldspar, so much altered to or replaced by quartz, sericite, and chlorite that it is generally impossible to ascertain their original composition. In one of the thin sections examined, however, they were determined as orthoclase and albite. Other phenocrysts are of hornblende, in part altered to epidote. These may be even larger than the feldspar phenocrysts. In most of the specimens examined, the amygdules have much the appearance of rounded feldspar phenocrysts, but well formed and unmistakeable amygdules may be seen in the rhyolite outcropping in the northeast corner of the map-area. The groundmass is a very fine aggregate of feldspar, quartz, chlorite, epidote, and sericite. The phenocrysts have a prismatic or lath-shaped habit and in general they have a common direction of elongation. In some of the thin sections examined they were observed also to have a distinct linear arrangement. The microscopic examination also reveals a well developed flow structure in the matrix, in a direction parallel to the elongation of the phenocrysts and swirling around them (see Plate I). As seen in the field, however, the rhyolite in general exhibits very few of the features characteristic of volcanic flows. Pillow structure may be seen in the rock exposed along the northwest shore of Dasserat lake and in the northeast corner of the area, where, in places, the rock is distinctly amygdaloidal and brecciated.

Acidic volcanics of somewhat different type are found in the southern part of the map-area, in the vicinity of Desvaux and Ogima lakes. They form all the rock cropping out on the westerly of the two peninsulas which form the 'narrows' between the northern and southern parts of Desvaux lake. They are bounded on the north and south and west by the V-shaped band of andesitic lavas between Desvaux and Ogima lakes, referred to earlier. They are believed to be the continuation of the band of similar acidic volcanics that crosses the Fortune Lake map-area in a southwesterly direction (1). To the north, west, and south of the ande-

(1) MacKenzie, G.S., Q.B.M., Geol. Rept. No.5, pp.8-9.

sitic lavas is another band of acidic flows. These outcrop on the shore of Desvaux lake just south of its outlet into Ogima lake and, continuing southwestward across the latter lake, terminate at an embayment in the overlying Cobalt sediments. From this point southeastward there is a series of outcrops of the acidic volcanics on the western and eastern shores in the southern part of Ogima lake. The total width of this band of acidic volcanics is about 500 to 1,000 feet.

The rock exposed near the outlet of Desvaux lake and on the western shore of Ogima lake, in the northern part of the band, is an acidic lava with pronounced amygdaloidal and pillow structure and displaying well defined flow lines and flow contacts. On the southeastern shore of Ogima lake, however, most of the outcrops seen are slightly sheared trachyte. It is possible that several flows are represented, but, if so, the divisions between them are not sufficiently clear to distinguish individual flows. Like the rhyolite, the rock is rich in amygdules, and in places pillow structure is well developed.

Under the microscope, the more acidic rock is seen to consist of minute laths of plagioclase arranged in rudely parallel position (trachytic texture), with interstitial quartz, chlorite, and calcite. The feldspar is albite-oligoclase and is more or less altered to sericite and kaolin. The trachyte is composed of similar feldspar laths, highly altered to sericite and chlorite with some epidote, in a groundmass of epidote and chlorite with a little feldspar and a very minor amount of quartz. In both rocks there are numerous amygdules filled with quartz and carbonate.

In various places, sericite schist is associated with the acidic volcanics. Usually it is in small amount, but it is fairly abundant along shear zones within these rocks near the Cobalt sediments west of Ogima lake.

Volcanic Fragmentals, Tuffs and Agglomerate

Fragmental rocks composed of closely packed andesite fragments up to ten inches in diameter in an altered basic matrix accompany the andesitic flows near the western shore of Ogima lake, close to the southern boundary of the map-area.

Coarse fragmental volcanic rocks and fine grained tuffs are associated with the acidic volcanic flows in numerous outcrops of these rocks along the shore of Dasserat lake, in the northern part of the map-area. The coarse fragmental rocks consist of rhyolitic fragments up to five inches in diameter in a rhyolite matrix. Tuff is less abundant and is usually found as narrow bands of white stratified material, which may mark the contact between lava flows. Examined under the microscope, both the coarse fragmentals and the tuffs are found to consist largely of secondary sericite, quartz, and feldspar.

About 800 feet south of the dam which prevents the water of Desvaux lake from flowing into Ogima lake, there is a band about 100 feet wide, striking a little south of east, of coarse, basic rock containing fragments

of acidic intrusive rock and also of basic rock which appears to be volcanic. This band is indicated as 'basic volcanic fragmental' on the accompanying map.

Most of the fragments in this agglomerate are semi-angular and of small size, but some of them are up to three feet in diameter. The band is in contact with acidic volcanics on its north side and with andesitic pillow lava on its south side. Lying within it, about twenty-five feet north of its southern margin - where the rock contains but few, small fragments of granitic rock - is a band about one foot wide, and with similar strike, of breccia in which the fragments are granitic, medium in size, very numerous, and closely packed.

Microscopic examination of the matrix of the agglomerate reveals that it is a coarse to medium grained basic rock, strongly sheared in places, composed of epidote, chlorite, and carbonate, with some quartz and very little feldspar, which is thoroughly altered. Some sections show what appear to be amygdules. Such a rock could be either a volcanic flow, originally of andesitic composition, or an intrusive dyke or sill, possibly, in that case, genetically related to the quartz diorite of the area.

Most of the fragments in the agglomerate are a light coloured, pinkish granitic rock with a coarse, porphyritic texture, in which large irregular grains of feldspar (microcline and albite) and quartz are plentifully distributed through a very fine grained groundmass consisting of epidote, quartz, and possibly some feldspar. The feldspar is slightly sericitized. The quartz grains are much shattered and the fractures traversing them are filled with fine grained material identical with that of the groundmass (see Plate II). The rock may best be designated a granite porphyry.

To explain the origin of this agglomerate, it is suggested that below it, at depth, there may be a body of granitic rock, to which, incidentally, the acidic volcanics of the area may be genetically related. During a period of volcanic activity, basic magma rising through this granite has torn fragments from the walls of the vents and these were imprisoned in the rock when it solidified at the surface as a lava flow or at depth as a dyke or sill.

MacKenzie(1) has described a somewhat similar fragmental rock occurring between Samia and Desvaux lakes, in Dasserat township, in which rounded fragments of granodiorite, up to one foot in diameter, and also smaller fragments of acidic and basic volcanic material, are included in a dark green, chloritic matrix. This he regards as a band of Temiscamian conglomerate engulfed in, and partially assimilated by, the diorite which flanks it. It is to be noted, however, that the fragments in this rock are all rounded, and that the matrix and also the adjacent rock is intrusive diorite, whereas in the agglomerate here described the fragments are for the most part angular to subangular and the matrix is apparently volcanic.

---

(1) MacKenzie, G.S., Fortune Lake and Wasa Lake Map-Areas, Q.B.M., Geol. Rept. No.5, 1940; Halliwell Mine Map-Area, Q.B.M., Geol. Rept. No.7, 1941.

Reference may also be made to certain 'pebble' or 'boulder' dykes occurring in the Guillet Township (1) and Flavrian Lake (2) areas, and also in the Porcupine district, Ontario (3). In these dykes, however, the matrix is intrusive rock and, judging by the descriptions, the fragments they contain are all well rounded.

Pre-Huronian Intrusive Rocks (Algoman)

Quartz Diorite (Older Gabbro)

Quartz diorite is widely distributed in the map-area. A great variety of types are represented and possibly they are not all of the same age. Generally, the rock has a coarse, massive texture and a rather basic composition, but locally it is gneissic and relatively acidic. In places, large irregular dykes of the diorite, with numerous offshoots, may be followed continuously over long distances; elsewhere, they are represented by a series of intermittent outcrops which are more or less aligned. Another common mode of occurrence is as narrow sills between lava flows. Where these follow the structure closely they appear like coarse grained lava flows.

The largest body of quartz diorite in the area is a dyke, intruding the Keewatin-type volcanics, which extends from the northeastern corner, passes between Dasserat and Desvaux lakes, and finally disappears beneath the rocks of the Cobalt series west of Ogima lake. This dyke is about 2,000 feet wide and crops out within the limits of the map-area over a length of two miles with a general S.50°W. direction. It is known to extend for at least a mile northeastward beyond the boundary of the area. The rock exhibits considerable variation from place to place, both in texture and composition. There are numerous very irregular patches of a pegmatitic phase in which the crystals of hornblende and feldspar are several inches long and which contain more quartz than the rest of the rock. Also, as a result presumably of differentiation, the rock of the southern side of the dyke is more basic than that of the northern side, being a gabbro which in places contains lenses and bands rich in magnetite, whereas in the northern half the rock is a light coloured quartz diorite in which there are abundant pegmatitic patches. The normal quartz diorite contains a high percentage of hornblende, more or less completely altered to chlorite, together with feldspar and its alteration product, epidote, and large grains of clear, quartz. Quartz-feldspar intergrowths are common. Accessory minerals are titanite and leucoxene, pyrite, and iron oxide.

To the northwest of this dyke there are three

---

(1) Denis, B.T., Guillet Township Map-Area; Ph.D. Thesis, McGill University, 1937.
(2) Robinson, W.G., Flavrian Lake Map-Area; Ph.D. Thesis, McGill University, 1941.
(3) Hurst, M.E., Recent Studies in the Porcupine Area; Can. Inst. Min. and Met., Trans., Vol.39, 1936, p.453.

irregular masses of similar rock which may be offshoots from the main dyke. In these bodies, the diorite is not very basic and it is more sheared than in the main dyke. In the central one, the diorite is seen in sharp contact with acidic volcanics, the contact striking approximately N.40°W., and at one point the rhyolite fills vertical cracks and fissures in the diorite. A close study of one of these fissures reveals that the rhyolite shows chilling effects over a width of about half an inch at its contacts with the diorite (Plate III), whereas there is no change in grain size in the adjacent diorite. There is, however, a narrow band of darker material in the diorite at the contact. This suggests that the rhyolite is younger than, or perhaps contemporaneous with, the diorite. It is possible that this rhyolite is an intrusive rock cutting both the quartz diorite and the acid volcanics.

Farther west, on the northeastern shore of Dasserat lake, there is another body of quartz diorite, which crops out also on the western half of island No.10, on island No.5, and on the southern shore of the lake southwest of the last named island. On island No.10, the diorite is in contact with rhyolite porphyry (strike of contact about N.20°E.) and is chilled against it, suggesting that it intrudes the volcanic rock. Diorite belonging to the same mass crops out on island No.11. Here, the diorite is very coarse and, on the northwestern side of the island particularly, it forms blocks in a finer matrix whose appearance suggests that it is a basic volcanic. This igneous rock of the matrix is rather fine grained and it occurs in places as long dykes or sills along fractures or banding in the diorite. The blocks of diorite have a diameter of one foot or more and some of them are traversed by veins of quartz which stop abruptly at the edge of the blocks. This strongly suggests that the diorite blocks are older than their matrix. Although the latter is believed to be volcanic it lacks any obvious volcanic texture and may possibly be intrusive and a late facies of the diorite.

Along the south shore of Dasserat lake, from the point nearest to island No.5 westward to about 200 feet east of the eastern boundary of block No.7, the rock shown on previous maps as quartz diorite is really a breccia consisting of fragments of diorite up to several feet in diameter embedded in a fine grained, pink rhyolite porphyry which is believed to be intrusive. Besides the fragments of diorite, this breccia contains occasional blocks of pink syenite porphyry and it is cut by dykes of diabase.

West of the southern part of Desvaux lake, there is a mass of quartz diorite which is very basic on the east side of the outcrop. In thin section, this basic facies is seen to be composed chiefly of amphibole and the rock might well be designated an amphibolite.

Pyroxenite and Lamprophyre

On the northern part of the fire-ranger's island (island No.9) and on islands No.15 and No.16, there is a type of rock which, in the field, looks like a contact-metamorphic rock. It is dark, massive, and contains numerous needles of actinolite and flakes of biotite. It is usually found near an intrusive body of syenite porphyry

Plate I.—Trachytic texture in rhyolite; northeast of Dasserat lake.

Plate II.—Brecciated quartz grains in agglomerate; south of dam between Desvaux and Ogima lakes.

Plate III.—Contact between quartz diorite and rhyolite; northeast of Dasserat lake.

Plate IV.—Zoned microcline in syenite porphyry; along telephone line north of Renault camps.

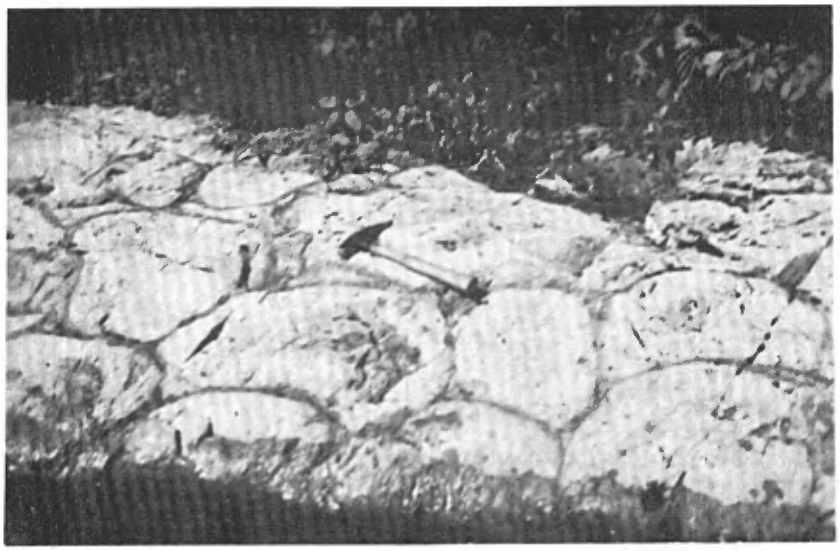

Plate V.—Pillow lava south of northern synclinal axis; on south shore of island in Desvaux lake, looking north.

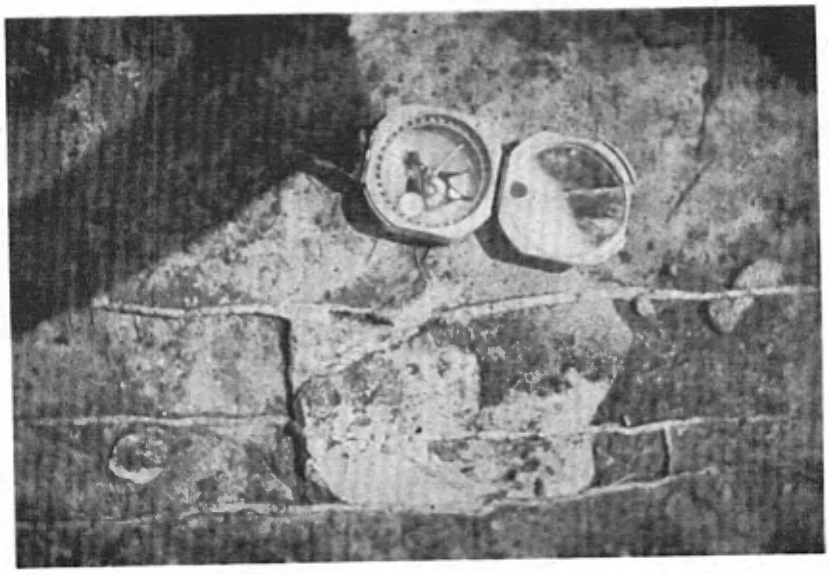

Plate VI.—Granite pebble, cut by quartz veins and aplite dykes, in conglomerate of Cobalt series.

Plate VII.—Smooth surface of Cobalt-Keewatin contact (Cobalt on top); west of Ogima lake.

Plate VIII.—Cobalt-Keewatin contact; point of hammer is on north slope of pre-Cobalt ridge.

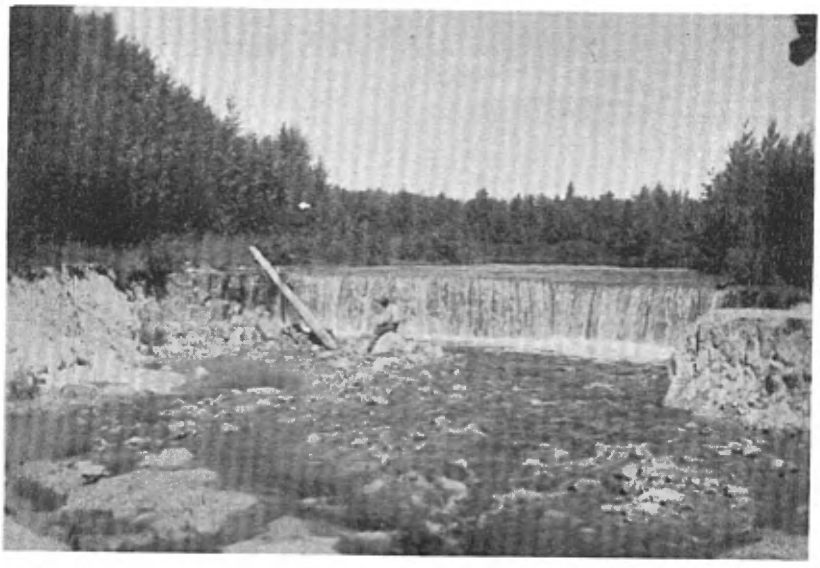

Plate IX.—Clay falls, 300 feet below dam between Desvaux and Ogima lakes.

and the biotite-rich facies of the rock contains numerous spots of a pink mineral which is believed to be secondary feldspar developed by the action of solutions from the intrusion. In thin section, the rock is seen to contain augite, biotite, actinolite, chlorite, epidote, and apatite in a groundmass rich in albite and scapolite. In one thin section, a large crystal of orthoclase was seen enclosing numerous grains of ferromagnesian minerals. Since augite is the most abundant, and apparently the only primary, constituent, the rock may best be designated a pyroxenite. In the rock exposed on island No.9, however, biotite is the main constituent.

In the northwestern part of island No.16 there are exposures of a greenish rock which contains an abundance of large hornblende phenocrysts, partly or completely altered to chlorite, in a groundmass composed mainly of large and small crystals of orthoclase and albite partly altered to epidote and sericite. The rock may be termed a hornblende lamprophyre.

Both the pyroxenite and the lamprophyre appear to be closely related to the Keewatin-like volcanics and the quartz diorite, and borh are intruded by dykes of syenite porphyry.

Diorite Porphyry

A mass of diorite porphyry crops out along the southern side of Renault bay, Dasserat lake, at a short distance from the shore. Actually, as exposed, it consists of two bodies separated by rocks of the overlying Cobalt series: a western portion which extends from the eastern boundary of block B southwestward for a distance of about three-quarters of a mile, and an eastern portion which crops out in the eastern half of block 6 and the western half of block 7. The two masses were mapped as a single unit on former maps. However, they differ somewhat in rock type and may represent two distinct intrusive masses. Both are intruded by syenite porphyry on the north side and are in contact on the south side with strata of the Cobalt series, which conceal their possible further extension in that direction.

Over most of its extent, the western body is intruded and altered by a swarm of dykes of syenite porphyry, which forms an extensive mass to the north. The true character of the rock is to be seen only in a series of outcrops immediately north of the contact with the sediments of the Cobalt series, in a band 250 to 300 feet wide which narrows toward the northeast and is only 50 to 100 feet wide along the western boundary line of block 4. As exposed here, the rock is dark grey, massive, very fine grained, and slightly porphyritic. Thin sections show phenocrysts of rather acid oligoclase (An12) in a very fine groundmass of quartz, albite, and carbonate with some chlorite and epidote. Farther north, the rock becomes coarser grained, more sheared and fractured, and lighter coloured as it is intruded by increasing numbers of dykes of syenite porphyry. The rock is so thoroughly fractured that it is difficult to obtain a representative sample; it breaks along dozens of fracture planes when hammered. The shearing and fracturing have also played an important rôle in assisting the extensive alteration of the rock. The contact with the syenite porphyry

body to the north is gradational, marked by a zone in which there is progressive increase in the number of dykes until the whole mass is syenite porphyry. Even close to the latter, however, there are patches of diorite porphyry which have not been very much altered by the younger porphyry. In these, the rock is still dark and massive, but it is a little coarser, and contains a much larger percentage of biotite, than the rock of the southern part of the mass.

The diorite porphyry of the eastern mass is much coarser, and somewhat lighter coloured, than that of the western mass. It is also more massive, more granular, and less porphyritic. At the northern margin of the mass, the rock contains numerous dykes of pink porphyry or appears as large blocks included in the latter rock, but even here it appears to be little if at all changed in composition. Thin sections show abundant laths of oligoclase (An12), about 1 mm. long, distributed through a groundmass of chlorite, quartz, feldspar, hornblende, apatite, and iron oxides. The feldspar is in part altered to sericite, and the hornblende to chlorite. In some thin sections, feldspar phenocrysts as basic as andesine (An48) were noted, but most of these were so highly altered that their determination is open to some doubt.

There is a definite change in appearance of the diorite porphyry from north to south, especially in the western body. Cooke (1) concluded that "the diorite phase (at the south) is more basic than the porphyritic phase (at the north)". However, this may be due to increasing hydrothermal alteration of the rock by the younger syenite porphyry intrusive rather than to differentiation in place followed by folding and tilting of the sill-like mass toward a synclinal axis to the north, as suggested by Cooke.

Syenite Porphyry

Dykes of syenite porphyry are widespread in the map-area. A particularly large mass of this rock occurs along the south shore of Renault bay, just north of the diorite porphyry. Similar dykes and masses are common in the surrounding district and the several facies of the rock making up the Aldermac intrusive, in Beauchastel township, have been described in detail by H.C. Gunning (2). Within the present map-area there are two main varieties which, for purposes of description, may be distinguished as biotite-hornblende syenite porphyry, and syenite porphyry.

A dyke of biotite-hornblende syenite porphyry cuts diorite porphyry along the margin of the body of this rock south of Renault bay, and is itself cut by a dyke of syenite porphyry. At one place, in the northwest corner of block 5, along the telephone line to the observation towers,

---

(1) Cooke, H.C., G.S.C., Sum. Rept., 1922, Part D, p.51.
(2) Gunning, H.C., Syenite Porphyry of Boischastel Township, Quebec; Geol. Surv. Can., Bull.46, 1927, p.31.

the three types of porphyry may be observed in the same outcrop. The main mass of this outcrop is biotite-rich syenite porphyry containing fragments of diorite porphyry. Both rocks are cut by narrow dykes of pink syenite porphyry (Plate IV) and all are cut by quartz veins.

The biotite-hornblende syenite porphyry is a coarse, dark rock characterized by large phenocrysts of pink feldspar in a groundmass of hornblende, chlorite, biotite, and large grains of garnet and titanite. Thin sections show large anhedral phenocrysts of andesine (An32) oriented at random in the rock and accompanied by large grains of apatite, which are partly resorbed at their contact with the feldspar. The groundmass is composed of biotite and hornblende, both largely altered to chlorite, and quartz, titanite, carbonate, iron oxides, and disseminated sulphides. A rock of similar type occurs along the southern side of islands No.15 and No.16, in the northwest corner of the map-area. Locally, in these two islands, the rock has a coarse, pegmatitic structure and, as in the occurrence first described, it is cut by pink syenite porphyry. Microscopic study of the rock reveals abundant phenocrysts of microcline feldspar in a groundmass of hornblende, chlorite, plagioclase feldspar (An38), apatite, and titanite, with practically no quartz.

The rock here designated 'syenite porphyry' is more widely distributed than the biotite-hornblende syenite porphyry. It is found as dykes and masses intruding all the formations yet described. Typically, it consists of well oriented, pink or white feldspar phenocrysts, up to 10 mm. long, in a dark coloured groundmass. The phenocrysts are albite and orthoclase, and some of them show pronounced zoning. The feldspar of the groundmass is mostly albite and is accompanied by quartz, hornblende, chlorite, titanite, carbonate, apatite, and epidote. The percentage of quartz is high in most samples of the rock but not high enough to make it a granite porphyry. In the mass along the southern shore of Renault bay, the rock presents a variety of facies. The most abundant is a coarse grained, brick-red to pink type in which phenocrysts of albite are distributed through a groundmass of quartz and albite with occasional grains of iron oxide and apatite. The quartz forms up to 20 per cent of the groundmass. This type of porphyry crops out all along the western side of the fire-ranger's island and also cuts the biotite-hornblende syenite porphyry on the southern part of islands No.15 and No.16. Intruding it are very irregular dykes of a coarse grained rock with a light greenish colour, consisting of white to green feldspar phenocrysts in a grey groundmass which weathers brown while the phenocrysts remain greenish-white. Under the microscope, the phenocrysts are seen to be very highly altered but they appear to be more sodic (An18) than those in the other syenite porphyries. There are numerous mica flakes in the groundmass, which consists otherwise of feldspar, quartz, and sericite, with local accumulations of quartz grains.

In places, rock of composite type is found near contacts between the syenite and diorite porphyries. Such rock is well exposed in a series of outcrops in the central part of block B. It consists of highly altered diorite porphyry injected by a network of very narrow dykes of syenite porphyry which give the rock as a whole a pinkish colour.

Rhyolite Porphyry and Porphyritic Aplite

In block 7, at 400 feet from the south shore of Dasserat lake, a msss of diorite porphyry is cut by numerous dykes of pink syenite porphyry and, along the northern margin of the outcrop, both rocks are intruded by a body of rhyolite porphyry. The latter rock is pink, very fine grained, and massive. It contains minute disseminated phenocrysts of altered feldspar in a groundmass of quartz, feldspar, and sericite. Quartz is the predominant mineral in the groundmass. It occurs as small interlocking grains occupying the interstices between the feldspar phenocrysts. These seem to have about the composition of oligoclase (An28). Rock of similar type but more distinctly porphyritic occurs 1,400 feet to the northeast, on the shore of Dasserat lake, where it forms the matrix of an intrusive breccia in which the fragments are mostly quartz diorite.

Narrow dykes of aplite were seen at various places within the map-area, more especially cutting the rocks of the Cobalt series, in which they usually occur in groups or zones, accompanied by quartz veins, filling a system of parallel fractures in the sediments. The best example of such dykes was seen in exposures 1,000 feet south of the southeastern corner of block 7, where they occupy a zone of fracturing about 200 feet wide with a general direction N.65°W. and a dip of 77° toward the north. It is common to find another set of fractures in the sediments, about at right angles to those mentioned, and also filled with aplite and quartz. In places, these two sets of veins and dykes are so numerous that the rock containing them has the appearance of a breccia.

Diabase

About 2,000 and 3,000 feet west of Ogima lake, a series of diabase dykes cut both acidic lavas and quartz diorite in a north-south direction. The individual dykes are of very irregular width, but in general they are between one or two feet wide. In thin section, the rock is seen to be fine grained, with a pronounced trachytic texture, in which laths of feldspar (labradorite) are distributed through a groundmass of augite, chlorite, quartz, and epidote. The feldspar, which is not very abundant, is fresh looking but there has been resorbtion around the edges of the laths.

Diabase dykes cutting diorite porphyry and syenite porphyry were seen also on the south shore of Dasserat lake, in the centre of block 7, and in an outcrop in the same block 100 feet from the line between it and block 6 and 400 feet from the shore of the lake. They are from one inch to 15 feet wide. The rock is dark and very massive, and under the microscope is seen to be composed of laths of labradorite, which are not very numerous, in a matrix of short prismatic crystals of pyroxene with a little hornblende and quartz.

No diabase dykes were seen cutting the sediments of the Cobalt series.

Cobalt Series

The sedimentary rocks of the Cobalt series in the area are chiefly conglomerate, argillite, and greywacke. Individual beds vary much in thickness from place to place and very seldom have great continuity along their strike. The pebbles of the conglomerate and breccia which form the basal beds of the formation are for the most part derived from the rocks of the underlying formations. In places near the base they are so large and numerous that they appear almost as if they were masses of rock intrusive into the Cobalt series. A large number of strike and dip observations, especially around the borders of the formation, indicate clearly that the sediments were deposited as a conformable series on a peneplaned surface. Furthermore, at several places, the contact may be observed over several hundred feet and in these places the underlying surface is usually very smooth, with an undulating profile. West of the north-south centre-line of the township, at 2,800 feet south of the end of Renault bay, the Precambrian rocks in contact with the basal Cobalt beds were observed to be furrowed with a series of narrow troughs and ridges which could well be glacial grooves. At one place, a few scratches were seen on the Precambrian rock surface, trending about parallel to the axis of the grooves (N.55°E.). This seems to confirm Cooke's (1) observations, which favoured the theory of a glaciated pre-Cobalt surface and a glacial origin for the Cobalt series.

Pleistocene and Recent

Unconsolidated Pleistocene and Recent sediments are widespread in the valleys and along the shores of the lakes in the area. They are composed of glacial débris, mostly clay with some sand, gravel, and boulders. There are extensive deposits of stratified clays at the northern end of Ogima lake and similar material probably forms the bed of this lake. Moraines are numerous, especially between the Swinging hills and Dasserat lake, west of the eastern boundary of block B. They are from 25 to 50 feet wide and may be followed for distances of 300 feet or more. Their trend is about east-west, but they have a curved shape with the convex side facing southward.

Glacial striae were seen on rock surfaces in numerous localities. They are generally oriented a few degrees east of south.

STRUCTURAL GEOLOGY

Structure in the Keewatin-type Volcanics

The Keewatin-type rocks of the area are closely folded and, particularly in the southeastern corner of the area, they are more or less schistose, but, in general, distinct bedding planes or other features that would aid in the determination of their attitude are rarely seen. However, such features were observed in a number of places

(1) Cooke, H.C., Geol. Surv. Can., Sum. Rept., 1922, Part D, pp.61-64.

in the southeastern part of the area and here the structure appears to be that of a westerly or southwesterly trending anticline flanked by a syncline on the north and the south, and all plunging toward the west.

As noted on an earlier page, a band of acidic lavas which enters the map-area from the east extends southwestward across the central part of Desvaux lake and terminates a short distance west of that lake against the apex of a V-shaped band of basic volcanics, by which it is flanked also on the north and south. Structural features, such as pillows, in outcrops along the narrow land strip between the northern and southern parts of Desvaux lake make it reasonably certain that this band of acidic volcanics has the form of an anticline plunging toward the west, where it disappears beneath the overlying basic volcanics.

This anticline is followed on the north by a syncline which, trending S.60°W., crosses the northeast corner of Desvaux lake and continues to, and across, the central part of Ogima lake, a short distance beyond which the volcanics pass beneath the sedimentary beds of the Cobalt series. Evidence that the structure here is a westerly plunging syncline was seen in outcrops at many places along the shore of Desvaux lake and on islands in the lake. Thus, on the small island in the northeast corner of the lake there are exposures consisting of a series of acidic lava flows in sharp contact, and gradation in grain size, and brecciation, indicate that the tops of the flows are toward the south; but south of here, on two larger islands, about in the centre of the northern part of the lake, the tops of ellipsoidal basic volcanics face north. Similarly, at the outlet of Desvaux lake into Ogima lake, the position of the synclinal axis is marked by pillowed lavas which, on the south side of the outlet, face north, and on the north side, face south; and, west of Ogima lake, there is evidence that the volcanics near their contact with the Cobalt sediments and close to the 'older diorite' intrusive have their tops facing south, whereas pillows in all observed outcrops of the lavas south of here indicate that the tops of the flows are toward the north. In this vicinity, the synclinal axis crosses the old Lapierre claims, just south of some outcrops of acidic lavas, and is marked by a strong zone of shearing, trending east-west or slightly south of west, within which there are well developed drag-folds striking S.70°W. and pitching 50° to 55° west. This lends support to the hypothesis that the syncline as a whole has a westward pitch. Where observed at one point, the axial plane of these drag-folds dips 65° north.

It was not possible to make many observations on the attitude of the volcanic flows along the northern limb of this syncline, because this side of the fold is intruded by the large dyke-like mass of quartz diorite (older diorite) to which reference has been made on an earlier page. However, just outside the map-area, on a small island near the north shore of Desvaux lake, exposures show sharp flow contacts, dipping 60° north, in acidic volcanics whose tops face to the south. This is in agreement with the observations of MacKenzie (1) along the

(1) MacKenzie, G.S., Q.B.M., Geol. Rept. No.5, p.14.

eastward continuation of this synclinal axis, in the adjoining Fortune Lake area, of which he says: "The few dips recorded (in the volcanics) are consistently northward. This supports the conclusion reached by Bruce, and earlier by Cooke, James and Mawdsley, that, in the areas concerned, the axial planes of the folds dip northward". It is therefore possible that this fold is slightly overturned toward the south.

Such an overturning would best explain the observed structural relationship between the volcanics and the older diorite. Contacts of this dyke-like mass with the volcanics dip northward, paralleling the flow contacts, but the (relative acidic) top of the mass faces northward, and not southward as do the flows it intrudes. This can be explained only on the assumption that the northerly dipping dyke was injected along the northern limb of the fold after it had been overturned to the south.

At the Lapierre camp, west of Ogima lake, the schistosity seems to indicate that the axial plane of the anticline that follows this syncline on the south is overturned toward the north, but this must be apparent only, and due to secondary shearing in the strong shear zone in the rocks in this vicinity.

The axial plane of the southern syncline appears to be vertical. Thus, flow contacts and pillows in the volcanics exposed along the west shore of Ogima lake, on the north side of the presumed axis, all dip to the south; and in a contact between pillow lava and a massive basic lava which is well exposed on a vertical east-west cliff on the south side of the axis, the dip is about 40° south. On the other hand, a slight overturning of the axis to the north is indicated by the schistosity in the basic lavas near their contact with sediments of the Cobalt series.

In the volcanics of the central and northern part of the area, structural features which might throw light on the attitude of the flows are rare, but such as were seen indicate that the tops of the flows are facing toward the south.

The structure, as outlined above, may be summarized as follows: Two synclinal axes in acidic lavas converge toward the west, meeting at a point a little south of the Lapierre camps. They possibly pitch westward at an angle of about 50°. The angle between them is occupied by a V-shaped band of basic lava, inside of which is a band of acidic lavas, probably oriented along an anticlinal axis. This band does not extend far into the Fortune Lake area adjoining on the east because, there, it has been eroded off on account of its westward plunge. If this interpretation is correct, the core of the anticline is composed of acidic lavas overlain by basic lavas; overlying these in turn are later acidic flows, which occupy the troughs of the northern and southern synclines; these swing westward around the nose of the anticline and there unite.

The line of prolongation of the two synclinal axes toward the west is marked by two strong, south-dipping shear zones; that along the northern axis is in acidic

lavas, the other, in basic lavas. There are numerous minor shear zones in the volcanics along the western shore of Desvaux lake, most of them striking east-west or a little south of west.

It may be noted that the northern syncline, and particularly its continuation in the region to the east, has been studied by several observers. Cooke (1), from his work in the Opasatika area, concluded that a synclinal axis with the axial plane overturned to the south extends in a S.80°E. direction across the southern part of Dasserat lake to and beyond Wasa lake, in Beauchastel township. Later work by Bruce (2) in the Arntfield-Aldermac area, and by MacKenzie (3) in the Fortune Lake area, strongly indicated that, in the eastern part of Dasserat township, the trend of this synclinal axis swings toward the southwest instead of continuing somewhat north of west across Dasserat lake, and this swing southwestward to cross the northeastern part of Desvaux lake was confirmed by field observations by Robinson (4).

Structure in the Intrusive Rocks

The masses of porphyry south of Renault bay are highly shattered, especially the diorite porphyry. The fracturing is so closely spaced that it is difficult to secure a hand specimen which is not crossed by several minute fractures. This characteristic is particularly conspicuous in the diorite porphyry and syenite porphyry cropping out in blocks B and C. Although the rock is thoroughly fractured, in few places only does it show true shearing. Where shearing was observed, it is not well defined and is difficult to follow along the strike, which is approximately east-west. The structural features of the quartz diorite (older diorite) have already been mentioned.

Structure in the Cobalt Series

The beds of the sedimentary Cobalt series are of very irregular thickness and it is generally impossible to follow individual beds for long distances. The strike and dip of the beds vary from place to place. The maximum dip observed was 35° and the average 10° to 15°. Wherever they were seen, the basal beds follow the contour of the older Pre-Huronian surface on which they were laid down.

Almost everywhere in these sediments there are various systems of fractures, which are shown very clearly on areal photographs. Near Dasserat lake they are particularly well developed and may be studied in detail. The

---

(1) Cooke, H.C., G.S.C., Sum. Rept., 1922, Part D, pp.31-35.
(2) Bruce, E.L., Arntfield-Aldermac Map-Area; Que. Bur. Mines, Ann. Rept., 1932, Part C, pp.48-50.
(3) MacKenzie, G.S., Q.B.M., Geol. Rept. No.5, pp.13-15.
(4) Robinson, W.G., Unpublished Ph.D. Thesis, McGill University, 1941.

main system is vertical, with strike east-west or N.80°W. It is intersected by two less prominent systems which strike N.25°W. and N.40°E., and dip at 10° and 55° south, respectively. These three systems of fracture govern the general appearance of the rock surface; the main system forms ridges, transverse to which are small valleys corresponding to the two other systems.

ECONOMIC GEOLOGY

Free (visible) gold has not been reported in the area, but assays have shown the presence of gold in material from quartz veins, and also from shear zones, in the intrusive and volcanic rocks at numerous localities. Chalcopyrite is common as disseminated grains in the syenite and diorite porphyries. Up to the present, however, no commercial deposits of gold or base-metals have been discovered in the area.

Renault Claims

Ref.: Geol. Surv. Can., Mem.166, 1931, pp.88, 94, 98, 106, 114, 146, 148.
Que. Bur. Mines, P.R. No.135, 1939, pp.5, 6.

The Renault claims include blocks A, B, C, and 4, 5, 6, 7, on the south shore of Dasserat lake. They are underlain by volcanics, quartz diorite, diorite and syenite porphyries, and sedimentary rocks (argillites and conglomerates) of the Cobalt series.

Numerous trenches and pits have exposed shear zones and veins, most of them of small dimensions, in the intrusive rocks. The writer was informed by A. Renault, owner of these claims, that assays have shown the presence of gold in material from some of the shears. A series of samples of the sheared diorite porphyry, taken by the writer and assayed in the laboratories of the Quebec Bureau of Mines, were found to contain both gold and copper. The highest results obtained were $6.82 in gold per ton and 0.66 per cent copper. These samples were from workings along the north-south centre-line of the township at about 1,700 feet from the end of Renault bay. They were taken at 7-foot intervals over a width of 40 feet across the shearing. These workings are in altered diorite porphyry which in places contains rounded fragments giving the rock the appearance of a conglomerate.

The syenite porphyry along the southeastern shore of Renault bay is cut by a quartz vein, some 600 feet long and one to four feet wide, striking in a general northeasterly direction. This vein has been explored by a series of test pits, by an adit 25 feet long opening the vein at its western end on the shore of the lake, and by seven diamond-drill holes of which no record could be found. The vein is of white, milky quartz carrying pyrite, chalcopyrite, some galena, and an unimportant amount of gold. The occurrence - and several others of the same type but less important - are described in the Bureau of Mines' Preliminary Report No.135.

Upstream Gold Mines, Limited

Quartz-pyrite veins are exposed in the northwestern corner of claim R-18846 on this property, which is on the south shore of the southeast bay of Dasserat lake, about 500 feet east of the trail leading to Desvaux lake.

The rock in the vicinity of the veins is quartz diorite and it is probably very close to the northern contact of this mass with the Keewatin-type volcanics. At the time of the writer's visit, a few of these veins, from one to four inches wide, were to be seen, striking about east-west and dipping 50° to 60° south. They were said to carry gold. Since that time, a series of trenches in the immediate vicinity has disclosed similar narrow veins and lenses in the quartz diorite, and, in one of these, scheelite occurs closely associated with the pyrite. This is a lens, four feet long and about two inches wide, which, under the ultra-violet lamp, graded about 0.5 per cent WO_3. Trenching and diamond drilling failed to reveal any other scheelite-bearing veins in the vicinity.

Gold has been reported on this property at various times between 1937 and 1943. One grab-sample taken by the writer assayed 0.08 oz. in gold per ton.

Saul Zeidel Claims

Some work has been done on the Saul Zeidel claims, R-47634-38, at the extreme east of Dasserat lake. About 1,800 feet due east of Groleau's camp, which is on the southeast shore of the lake and 2,500 feet south of post 44-45 on the east-west centre line, a trench has exposed a contact between syenite porphyry and the large dyke of quartz diorite. Near the contact, the syenite porphyry is heavily mineralized with pyrite, a little chalcopyrite, and some magnetite. Assays of grab samples taken by the writer showed only traces of gold, but the owners report that some assays of the mineralized material have shown an appreciable content of gold.

General

Old workings may be seen in several other places in the area, and particularly along the two shear zones west of Ogima lake. The more northerly of these shear-zones was explored extensively by the Lapierre-Dasserat Syndicate prior to 1928. Several test pits were sunk along the shear in the acidic volcanics, which contain abundant disseminated sulphides. Assays of picked samples taken by the writer showed only low values in gold.

ALPHABETICAL INDEX