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PRELIMINARY REPORT ON PARTS OF DUVERNY AND LANDRIENNE TOWNSHIPS, ABITIBI-EAST COUNTIES

PROVINCE OF QUEBEC, CANADA

DEPARTMENT OF MINES

MINERAL DEPOSITS BRANCH

PRELIMINARY REPORT

ON PARTS OF

DUVERNY AND LANDRIENNE TOWNSHIPS

ABITIBI-EAST COUNTY

BY

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by W.W. Weber

INTRODUCTION

Duverny and Landrienne townships are situated in the mining district of northwestern Quebec. The southwestern corner of Duverny and the northwestern corner of Landrienne are approximately five and one-half miles east of the town of Amos. The northern transcontinental line of the Canadian National Railways passes across range IX, Landrienne township, and the nearest station, Landrienne, is located in lot 12 of the same range.

The map-area covered during the 1947 season comprises lots 1 to 45, range I to III in Duverny township, and lots 1 to 47, range IX and X in Landrienne. Secondary roads provide easy access to the southern and western parts of the map-area. The northeastern part of the area can be reached either from the old portage road connecting the Duverny-Landrienne township boundary at lot 31 with Lac Castagnier or via the secondary road separating ranges V and VI of Duverny, and thence over the Monpas tractor road leading southeast from the Claverny camp. No means of water transportation are available within the map-area.

Relief in the area does not exceed 300 feet. Low areas are swampy, flat tracts typical of the northern Laurentian Plateau. Rock exposures average between 7 and 10 per cent of the total area.

Geological mapping, at a scale of 1 inch to 500 feet, was carried out with the aid of aerial photographs enlarged to the same scale. In addition to the general mapping, the available geophysical surveys and diamond drilling results were incorporated into the geological components of the map.

GENERAL GEOLOGY

All the consolidated rocks within the area are of Precambrian age and the majority of the exposures are Keewatin-type volcanics. These rocks constitute the oldest formations and have a variety of representatives which include acid, intermediate, and basic lava flows, and occasional bands of

breccia, agglomerate, and variable tuff types. They are intruded, conformably and unconformably, by masses ranging in composition from a leucocratic granite to peridotite. No sediments of either Keewatin or Temiskaming types are known to occur in the map-area. A detailed study of the specimens collected in the field remains to be completed, and thus identifications of the rock types in this report are based entirely on field studies.

Table of Formations

Quaternary	Pleistocene	Stream and swamp deposits Till, sand, gravel, and lacustrine clays
Late Precambrian	Keewenawan (?)	Diabase, gabbro, and quartz gabbro dykes
Post-Algoman or Late Algoman		Quartz veins Faulting
Early Precambrian	Algoman (?)	Aplite, diorite, quartz porphyry, and diorite porphyry dykes Granite, porphyritic granite and granodiorite
	Post-Keewatin-type	Peridotite Quartz and feldspar, albite porphyries Gabbro, diorite and quartz diorite Faulting and folding
	Keewatin-type	Metadiorite and metadiabase Acidic lavas, pyroclastics, and minor intermediate volcanics Intermediate lavas, agglomerate Basic lavas, tuffs, flow breccia

Rock Types

Keewatin-type Volcanics

The principal exposures of Keewatin-type volcanics outcrop in lots 30 to 45, range III, lots 28 to 36, range II, and lots 1 to 20, range I in Duverny township, and in lots 1 to 15 astraddle the line separating ranges IX and X in Landrienne township. The sequence in the area indicates that the earliest vulcanism was characterized by basic outpourings and that, higher in the column, acid lavas and fragmental rocks tend to increase in frequency of occurrence.

Acidic Series

Though outcrops of the acidic members of the flow series are relatively rare and usually small, bands of rhyolite are of considerable importance as horizon markers. In the vicinity of the line separating ranges II and III, local variations in the dominantly trachytic and dacitic lavas are representative of the rhyolite series.

Persistent banding due to alternate grey, pink, yellow and white layers is pronounced in some exposures of these rocks. In some places, the rock resembles a chert; in others, it is the result of successive layers of chert and fine-grained quartzite, stained brown. Where this rock consists of cherty siliceous material alone, it is believed to be a rhyolite, but, where it is associated with tuffs, the presence of the iron-stained quartzite is corroborative evidence in favour of water sorting, and the rock is considered to be a siliceous iron formation. The best examples of the supposed iron formation are to be found to the south of the peridotite contact in lot 1, range X, and in lot 27, range IX, Landrienne township.

Lava flows, considered to be mainly trachytic and dacitic in composition, outcrop in almost continuous exposures, one-half mile in width, and extend from lot 34 to lot 47 along the range-line separating ranges II and III in Duverny township. This series contains numerous bands of breccia and brecciated flow material. The complete series has been sheared in the plane of the synclinal axis. Pillow structures, outlined by vague narrow rinds of epidote one-half to three-quarters of an inch in thickness, were observed in the dacite.

Intermediate Series

The intermediate members of the flow group consist mainly of dacites with probably considerable silicified andesite included within the division. These rocks have the greatest variation in texture, structure, and composition. Two main rock types, a feldspathic, porphyritic dacite and a bun-pillowed dacite, were the most frequently encountered. Variolitic, vesicular, amygdaloidal, and massive flow types were also noted in the field.

The porphyritic dacite contains abundant whitish phenocrysts in a greenish chloritic matrix and is less brittle and siliceous than its acid counterpart. The weathered surface is generally light green, but a creamy buff is more common in cases of extreme alteration.

The typical bun-pillowed dacite has a distinctive pillow structure. Coarse rinds, up to 4 inches in thickness, usually possessing a sugary texture, surround a vesicular bomb-like centre of darker, chloritized material. Radiating and concentric structures are visible in the inner core. Uniformity of the development of the pillow structures is particularly striking. Well developed examples of the porphyritic dacite are exposed in lots 14 to 20, range I of Duverny township, and the pillowed variety, of more widespread occurrence, can be seen in most of the exposures in lots 15 to 18, range I, and lots 15 to 19, range II of Duverny.

In lot 37, range II of Duverny, a dacite was found to contain lithophysae of milky quartz up to 6 inches in diameter. Vesicular dacite, common in the lavas in lots 31 and 32, range II, can be readily recognized by the pitted, weathered surface. Fresh surfaces of both the amygdaloidal and vesicular lavas have their openings filled with quartz, carbonate, epidote, and secondary products.

Basic Series

The basic lavas, the oldest rocks of the area, consist mainly of andesites and basalts and are generally distributed throughout the area. The major portion of the lava series is of this type and is predominent in range I of Duverny township, and ranges IX and X, of Landrienne.

Three common varieties constitute the mappable units. These are a massive, fine-grained andesite, a mattress-pillowed andesite or basalt, and a coarse dioritic andesite.

The fine-grained andesites occur as the chilled margins of pillowed flows, as narrow massive flows, or as the margins of the larger sill-like bodies.

The pillowed andesite and basalt are of very common occurrence.

Sill-like, conformable flows of andesitic composition, containing altered femic phenocrysts up to 5 mm. in diameter, occur unfrequently in the flow series. It is possible that some of the masses of this type are of intrusive origin; frequently the exposures are so limited in extent that the relationship cannot be satisfactorily established.

Pyroclastics

Fine tuffs of acidic composition are found as narrow bands in the acid volcanics in the western part of range II of Duverny township, and as

inliers within, and at the contact with, the sill complex. In the northern part of lots 3 and 4, range I of Duverny, sericitic schists of fine acid material are believed to represent former tuffaceous material. Narrow beds of fine-grained tuff occur commonly in the acid volcanics.

Acid breccia and agglomerate bands up to 100 feet in thickness are common throughout the eastern part of range II and the southern part of range III in Duverny township. Considerable thicknesses and probable extensions of the eastern exposures have been outlined in the drilling sections on the Wendell property in the vicinity of the granite contact in lots 10 and 12, range II of Duverny. A distinctive band of coarse rhyolitic fragmental formed of reddish siliceous fragments embedded in a grey matrix outcrops 450 feet north of the line separating ranges II and III in lot 34.

Throughout the major portion of the northern exposures in lots 4 to 11, range I in Duverny township, basic fragmental lavas and agglomerate horizons, interbedded with lesser amounts of pillowed andesite and basalt, predominate the exposed sections. The most common rock type is a coarse tuff of large bomb-like fragments set in a dark green chloritic matrix. Well developed basic fragmental lavas are also exposed throughout the southern part of lots 32 to 35, range I in Duverny. Pyroclastics are rarely found in ranges IX and X of Landrienne township, in comparison to the profusion recorded in ranges I, II, and III of Duverny.

Basic tuffs of extremely fine grain size are commonly present as narrow bands of schistose material separating the individual members of the flow series, but, in the majority of cases, the recognition is extremely difficult to confirm.

Post Keewatin-type Intrusives

Gabbro, Gabbro-diorite

The oldest intrusive rock in the area is believed to be one of the components of the sill-like complex, which is about 1,200 feet in width and extends for a distance of about seven miles across the southern part of the map-sheet. The continuity of the sill has been reasonably well preserved despite dynamic activity subsequent to its emplacement, and the exposures from the western boundary of Landrienne township to the vicinity of the northern part of lot 32, range IX, permit a fair study of the make-up of the complex. Eastward, beyond lot 32, the scarcity of critical outcrop renders the suggested interpretations more conjectural.

The complex lies on the northern limb of an anticline. No corresponding zone has been found on the southern limb, which fact suggests that the complex was introduced after the period of folding.

Four main rock types of variable age relationships are discernible within the complex, namely: the gabbro and quartz gabbro sill proper; the peridotite-serpentine-pyroxenite intrusive; the acidic porphyry dykes; and the inlying remnants of the invaded volcanics.

The main member of the complex is a greyish-green gabbro with approximately equal amounts of light-coloured plagioclase and dark-coloured femic minerals forming a medium to coarse-grained equigranular aggregate. This rock type occupies the lower two-thirds of the complex. In the northern, upper limits of the intrusive, gradational changes in the proportion of the feldspar and in the appearance of quartz mark the transition to the diorite and the quartz diorite phases. Of minor and localized importance is the appearance of serpentinized gabbro near the base of the sill. Pegmatitic segregations occur within the gabbro and good examples of axinite, tremolite, and actinolite crystals were found in lots 17 and 18, range IX of Landrienne township.

Further sill-like intrusions of gabbro with transitional and localized phases of dioritic composition outcrop within the volcanics in lots 34 and 35, range II, and lot 12, range I of Duverny township. Evidence of age relationship (other than confirmed post-Keewatin origin) is not apparent in the field. The appearance of the gabbro is somewhat similar to that of the gabbro of the sill. Common to all three occurrences is the presence of porphyry dykes cutting the gabbro.

Quartz Diorite

Owing to the scarcity of the outcrops of the intrusive bodies in the eastern extremity of the sill, many geological problems remain unsolved. An isolated stock-like body of quartz diorite outcrops in lot 43, range IX of Landrienne township, and a narrow band of rock of similar composition, believed to be the upper limit of the sill, was found along the southern margin of the outcrop in lot 38 of the same range. This quartz diorite resembles the counterpart found in the upper limits of the sill in lot 18, range IX in Landrienne township. As, in the sill, the quartz diorite has been intruded by porphyry dykes, and, finally, its spatial relationship to the sill also suggests that it may be contemporaneous.

Post-gabbro Intrusives

The gabbro has been intruded by a pyroxenite-serpentine-peridotite dyke, acid porphyries, basic pegmatite, serpentine-calcite dykelets, gabbro and diabase dykes.

The acid porphyries of the quartz and feldspar varieties are believed either to be derivatives of the gabbro-diorite in the sill or to have their origin in the underlying granite mass. The dykes are confined to the gabbro or the earlier Keewatin volcanics and are pre-peridotite in age. Slender amphibole crystals up to 2 mm. in diameter are characteristic of the gabbro near the contact with the porphyry. In lot 43, range IX of Landrienne township, amphibole crystals up to 15 mm. in length have been developed in the quartz diorite close to the contact with the porphyry.

A sinuous dyke-like body of serpentinized peridotite intrudes the gabbro in the basal portion of the sill from the eastern boundary in the

southern part of range X, to the northern part of lot 32, range IX of Landrienne township. From lots 14 to 32, range IX of the same township, a second, upper zone of peridotite has been intruded near the transitional contact between the gabbro and the dioritic facies of the sill. The position of both zones varies with respect to the limits of the sill; the lower zone tends to depart from the base of the sill and even cuts into the volcanics lying to the south, whereas the upper zone is believed to be contained entirely within the gabbro, but, to the east of lot 32, it may be split to form a third horizon.

At the contact between the serpentinized peridotite and the gabbro, the peridotite is replaced by a zone of pyroxenite which can be readily distinguished by the reddish brown stain characteristic of the weathered surface of the rock. On the other hand, at the contact of serpentine and porphyry, the porphyry has been silicified and appears to have been altered by the intrusion of the serpentine.

Within the serpentine, narrow dykelets of calcite-serpentine-actinolitic amphibole are common. Chrysotile asbestos, as cross-fibre of promising quality and quantity, is also found in the serpentine.

L.J. Weeks (1) has implied that the various types of rocks in the complex have originated as the result of differentiation and that the sill was intruded prior to the folding. The present writer suggests that the intrusions are wholly post-folding and that the variety of the intrusive rock types is due in part to the effects of separate, successive periods of intrusion, not necessarily separated by great time-intervals.

Failure of the sill to appear on the southern limb of the anticline is the underlying argument of a post-folding age for the complex. This anticline had not been recognized at the time of the earlier mapping of the area.

Porphyries

In addition to the porphyry dykes described in the preceding section, four distinct porphyry dykes were noted in the field.

A large number of small porphyry dykes, mainly quartz porphyry, intrude the volcanics to the north and the south of the gabbro throughout the major portion of range IX in Landrienne township. They trend for the most part roughly east-west, parallel to the anticlinal axis. Their distribution and composition suggest that they are genetically related to the porphyries that intrude the gabbro sill; tentatively, their age is assumed to be post-gabbro and pre-peridotite. Near the axis, the dykes are sheared in the plane of the fold axis which records evidence of movement in the axial plane considerably later than the folding.

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(1) L.J. Weeks, Map 530A, G.S.C., 1937.

Several dykes of diorite outcrop in isolated areas of the map-sheet. Porphyritic phases are apparent in some instances. The majority of the diorite dykes resemble the typical exposures in lot 11 and 12, range I of Duverny township. The general trend is rather uniform and varies from 20 degrees north of west to 55 degrees north of west. Rocks of a similar type are known to cut the granite in lots 15 and 16, range III of the same township, and also appear in some instances to follow the trend of the volcanics parallel to the fold axes.

Two small dykes of syenite porphyry, trending north to northeast, cut the basic volcanics north of the range-line separating Landrienne and Duverny townships in lot 30 and in lot 26, range X of Landrienne. In each case, the intrusion is associated with flexures of the volcanic rocks and movements along a minor fault striking northeast.

A quartz-diorite-porphyry dyke outcrops in lot 34, range II, in Duverny township. This dyke transects the gabbro and also a feldspar-porphyry dyke, which likewise intrudes the gabbro. A similar rock type was found to cut the granite in lot 15, range III of Duverny. Here, the trend of the dyke was 20 to 30 degrees south of east.

Granite and Granodiorite

The northwest corner of the map-area is underlain by part of a stock-like body of granite that extends beyond the boundaries of the area. The granite, which is relatively unaltered, contains both microcline and plagioclase feldspars.

The granite mass is cut throughout by aplite, lamprophyre, and narrow pegmatite dykes; the last are not common and are usually found filling the narrow protoclastic fractures in the granite. A study of the trend of the diaschistic dykes revealed that 80 per cent of these dykes were found to have a strike ranging between 10 degrees west of north and 15 degrees east of north.

In the northwestern corner of the map-area, the granite has been intruded by a quartz porphyry dyke, up to forty feet in width, which strikes approximately north 45 degrees west. The dyke is exposed in scattered outcrops for a length of nearly a mile. This porphyry has a dark-blue matrix, occasionally in cases of extreme alteration a sea-green colour, and bluish to milky phenocrysts of quartz 'eyes' up to 9 mm. in diameter. The rock, for the most part, is strongly altered. A well developed tension fracture system and ladder structure in the vicinity of the Eastmac 'showings' are filled with milky quartz in rolls, blebs, and curls.

In the southern part of lots 33 to 35, range III of Duverny township, a small group of granite outcrops is exposed and these outcrops constitute the most easterly surface continuation of the unaltered granite. In the exposures, the granite shows distinct evidence of considerable alteration similar to the contact zone of the main granite mass. The isolated position of the outcrops may indicate a separate cupola or an offshoot of the main granite mass.

Several small exposures of granodiorite similar to the Claverny type lie in the northern part of lot 36, range II of Duverny township. The limited outcropping failed to register any indications of age or genetic relationship.

Late Precambrian Dykes

A dyke of diabase, up to 200 feet in width, trending slightly east of north, cuts the Keewatin-type volcanics and the entire assemblage of rock types in the basic complex in lots 16 and 17, range IX of Landrienne township. The contacts with the enclosing rocks are normally sharp and nearly vertical. In the southern part of lot 17, range IX of the same township, however, an identical rock type is exposed as a small sheet-like body in a vertical cliff face. Here, the intrusion has domed the overlying volcanics and effected a zone of alteration surrounding the intrusive. Small slips and crumpled shears are likewise apparent and evidence the dynamic forces associated with intrusion.

A long, sinuous, dyke-like intrusive body of gabbro with a variable strike ranging from east-west to north-south, but following a general trend of north 45 degrees east, winds through the southeastern portion of the map-area. Cross-cutting relationships between the gabbro dyke and the basic complex in lot 38, range IX of Landrienne, indicate that the dyke-like intrusive is the younger. The parallelism of this dyke with the trend of the late faulting, as well as the diabase described above, suggests the age to be Late Precambrian and possibly Keweenawan. The relationship of the diabase and the gabbro dykes is not apparent in the field studies, but, on the basis of physical characteristics, the rocks appear to be separate entities.

Non-consolidated Sediments

The greater part of the area is overlain by a mantle of glacial drift. In the southern sector a lake-bottom plain area is the most heavily covered. Vertical sections in the gravel quarry in range X of Landrienne township expose recent lacustrine deposits of local occurrence within the poorly sorted drift. Stream and swamp deposits form local accumulations in the low-lying areas.

STRUCTURE

Folding

The major portion of the map-area lies in the trough of a synclinal axis located in the southern part of range III of Duverny township, and the connecting limb between it and the corresponding anticlinal axis located in the central part of range IX of Landrienne. These are the two major fold axes exposed in the map-area.

The general trend of the volcanics approximates east-west, but local flexures in the warped major folds are apparent, and the divergence of strike noted in the field varied from north 65 degrees east to north 105 degrees east. Evidence of large-scale drag-folding of the volcanics in the vicinity of the contact with intrusive bodies and of the fault zones is lacking. In some instances, the degree of overturn is appreciable, and, mainly on the basis of the attitude of well developed pillow structures, the general maximum appears in the vicinity of the anticlinal axis. Normal dips, as low as 70 degrees, and overturned flow series dipping at 65 degrees were the extremes recorded, but the greatest proportion of the recordings approached vertical.

In the southern part of lot 45, range III of Duverny township, the acid volcanics have been sheared and drag-folded in the plane of the synclinal axis. Here, observations indicate that the drag-folding opens to the east and plunges in the same direction at a low angle. This would indicate a closed symmetrical fold with a slight plunge to the east and possibly a minor degree of overturn to the north in the synclinal structure. However, in the broader regional picture, the closure apparent on the bands of breccia used as horizon markers in this vicinity indicates that the plunge of the syncline is gently to the west. It is the author's opinion that, in the face of the conflicting evidence, the drag-folding apparent in the plane of the axis is related to the shearing and possibly the result of the intrusion of the granite along the synclinal axis in the western part of the map-area.

Observations on the anticlinal axis in range IX of Landrienne township failed to record conclusive evidence of plunge, though the degree of overturn to the south is notable. The axis is sharply defined from lots 22 to 35, and no flat-lying flows are to be found in the vicinity of the crest, but rather a uniform dip to the north of approximately 80 degrees occurs throughout the exposed length. Minor shearing and resultant alteration are apparent adjacent to the axial plane.

Shearing

Shearing parallel to the trend of the volcanics is the commonest and earliest recorded movement in the area. Continual adjustment along these planes has been noted the recur, but evidence of post-folding movement is relatively slight. Well developed examples over persistent widths are exposed in the central section of range III, on the Monpas property.

The projected extension of the Fontana-Claverny shearing from the adjacent map-area failed to appear in exposures on the assumed alignment. The absence of shearing of a similar trend, north 45 degrees west, was marked in comparison to conditions to the north of the granite stock. Minor fault planes noted in the vicinity of the range-line separating ranges III and IV, in lots 6 to 10, were the only instances noted of movement along planes of this direction.

In the southern sector, shearing has been of a mild nature and selective in action, with flow tops and fragmental horizons providing accommodation for minor movement. Massive flows do not appear to be affected.

Of special note is the relatively incompetent peridotite and its reaction to shearing forces. Serpentinization of the peridotite appears to be intimately associated with strike-shearing within the intrusive body. Movement along slip planes parallel to the trend of the intrusive has resulted in a linear schistosity and destruction of the diagnostic cooling joint system. Branching, irregular schistose zones parallel to the contact do not invade the older gabbro. W.R. Sutton (1) has associated this shearing with the formation of the chrysotile fibre found in the highly serpentinized peridotite.

Faulting

A series of strong parallel faults striking north to north 30 degrees east is suggested by the disposition of the horizon markers throughout the area. Discontinuities of the basic complex in lots 4 and 5, 10 and 11, and 15 and 16, ranges IX and X of Landrienne township, illustrate this movement. In the majority of instances, the movement has been east side moving towards the north relative to the west side. Indirect evidence of displacement of the volcanic series, stream patterns, and topographic control suggest additional movements, but scarcity of critical exposures precluded direct examination of assumed dislocations.

Subsidiary faults striking somewhat east of north are assumed to occur adjacent to outcrop in the northern part of lot 27, range X of Landrienne township, and the southern part of lot 29, range I of Duverny. Minor displacements have been noted on porphyry dykes and other well defined horizons, but the total displacement and direction of displacement is conjectural. Observations of the associated shearing in the above mentioned instances, indicate the latest movement on record has resulted in the displacement of the north side towards the west relative to the south side.

Alteration and Metamorphism

The most striking observation of the season was the absence of strong carbonatization to the south of the granite stock. With the exception of the northeastern corner of the map-area, the degree of alteration, especially the carbonatization, is insignificant in comparison to the degree apparent to the north of the granite mass.

ECONOMIC GEOLOGY

Within the map-area, the main prospecting has been directed in search of the precious metals, but local appreciations of associated base-metal possibilities have also been made. Lately the possible utilization of two non-metallic products has received a share of the exploration.

(1) W.R. Sutton, Mining Engineer, Paramount Mining and Developing Syndicate Limited.

Gold mineralization of localized occurrence has been reported in the quartz bodies in the porphyry dyke on the Eastmac property. Traces of gold have been reported for almost all parts of the area.

Chalcopyrite, sphalerite, and galena mineralization as found on the Monpas property has been the main base-metal indication. Widespread pyrite, pyrrhotite, and minor chalcopyrite mineralization has been noted in numerous instances, but especially noteworthy are those in lot 38, range IX of Landrienne township, and the central sector of range I in Duverny. Samples taken from these occurrences failed to disclose concentrations approaching economic grades.

A single sample of the relatively pure rhyolite taken from the exposures in lot 10, range I of Duverny township, was submitted for testing material as a possible material for the manufacture of roofing granules. Apparently the tests were not completed.

Glossy olive-green chrysotile cross-fibre asbestos occurs as narrow veinlets in the serpentinized peridotite. The veinlets vary in width from mere fractures to one and one-half inches in the best specimens collected, but the longest fibre, unbroken by partings, slightly exceeds three-eighths of an inch. The normal length of the fibre in the best showings is from one-eighth to three-eighths of an inch separated by distances up to a foot but with numerous smaller thread-like fractures intervening. In general the fibre is short.

Although it is slightly brittle, the fibre readily peels into fluffy, white masses under the pressure of the thumb nail.

The fibre veinlets are short, discontinuous, and occasionally criss-cross with suggestions of two or more ages. The most apparent structural controls of the disposition of the fibre veinlets are the cooling joints and tensional openings adjacent to the sheared horizons.

The origin of the chrysotile appears to be the result of hot magmatic waters charged with silica from an unknown source circulating within the peridotite through openings provided by the shearing stress.

The amphibole variety occurring as actinolitic slip fibre has also been found in several instances, the most noteworthy of which are the occurrences in lots 17 and 18, range IX of Landrienne township. Here the slip fibre appears in a calcite-serpentine-tremolite-actinolite dykelet. The observed prospect pits were covered with fluffy masses of the altered material, but quantity and quality appeared lacking in the primary veinlet.

At present, the exploration has not proceeded beyond surface exploration, localized test-pitting, and diamond drilling. Two main interests, the Paramount Mining and Developing Syndicate Limited and the Johnson's Company Limited have sponsored the geological investigation.

PROPERTY DESCRIPTIONS

Considerable mining activity in past years has resulted in the sinking of a single exploratory shaft and widespread trenching, diamond drilling, and prospecting programmes. No prospect within the area has proven the existence of an orebody of mineable size and grade under present conditions. At present, the area is dormant with little more than routine assessment work in progress.

Eastmac Mines Ltd.

Ref.: Que. Bur. Mines, P.R. 116, 1936, p. 75.

The present company, recently incorporated to take over the holdings of Seaforth Mines Limited, has not as yet completed any further exploration on the property in the past year.

The original holdings under control of the Franco-Canadienne interests, a French-controlled group active in Duverny during the 1936-1940 period, comprised lots 3 to 8, range III, and the north halves of lots 4 to 7, range II of Duverny township.

In the southern occurrence in lots 5 and 6, adjacent to the lot-line, approximately 2,200 feet north of the line separating ranges II and III, the porphyry dyke which crosses the property in a north-west direction is complexly fractured and contains blebs, rolls, curls, and veins of quartz. Drag-folding adjacent to a shear zone paralleling the southern contact has further complicated the trend of the quartz structures. Mineralization apparent is sparsely occurring chalcopyrite, sphalerite, and galena in the milky quartz. Several large test pits and cross trenches over a length of 100 feet have exposed the porphyry dyke over the limits of outcrop. Samples taken from the various pits are reported to have yielded as high as $14.87 in gold per ton, and one sample of the porphyry wall rock yielded $2.37 in gold per ton.

In the northern occurrence in lot 3, range III of Duverny township, the quartz-pocketed porphyry dyke appears again on the line of strike. Under the Franco-Canadienne interests, an inclined shaft was sunk to explore the area adjacent to the dyke and also the quartz-filled tension fractures which strike at right angles to the dyke and are exposed in a series for distances up to 80 feet from the contact of the dyke and the granite. Quartz widths in the dyke have a maximum of nearly 5 feet, whereas widths ranging from 4 to 28 inches are apparent in the granite. The shaft, inclined at 71 degrees to the east, is reportedly 80 feet deep. The continuation of the porphyry dyke has been cross-trenched to the northwest of the shaft for a distance of about 300 feet. Samples taken by the writer were barren of mineralization to the naked eye and contained no gold on assaying in all cases.

During the 1945-1946 seasons, Seaforth Mines Limited, under the direction of Dr. S.E. Malouf, sampled and tested the old workings on the

surface, as well as dewatering and sampling the shaft. In addition, the programme included about 2,500 feet of diamond drilling along the strike of the porphyry dyke in the vicinity of the northern and southern occurrences.

The property is at present inactive and no word has been received from Eastmac Mines Limited, the new owners, regarding proposed exploration.

Wendell Gold Mines Limited

The Wendell property consists of twenty-seven mining claims comprising the following ground: lots 13 and 14, and the northern halves of lots 15 and 16, in range X of Landrienne township; lots 7 to 14, range I, lots 6 to 14, and the southern halves of lots 7 and 15, range II in Duverny.

Prior to exploration by the present company, a minor amount of prospecting had been done on the claims, but most of the work now apparent was completed during the 1945-1946 seasons.

A magnetometer survey was completed over 650 acres of the property in the south-central area. Drilling of the magnetic anomalies and surface indications followed this survey. A total of twenty-three diamond-drill holes aggregating approximately 13,500 feet were spaced throughout ten claims of the group. Assays taken were negligible with $0.57 of gold per ton the maximum. According to company reports, copper tenors up to 5 per cent were encountered in the vicinity of the surface occurrence 1,800 feet north of the township boundary, on lot-line 13-14. Nickel indications up to 1 per cent are also reported from this locality.

To the north of this occurrence, a sparingly mineralized carbonate band was encountered in the drilling along lot-line 13-14, approximately 12 to 15 hundred feet south of range-line I-II, in Duverny township. This horizon is the westward extension of the surface occurrence on the adjoining property of Trans-Duverny Gold Mines Limited. Graphite shearing of widths up to 5 feet were intersected in the drilling, but the quality of the graphite was not of commercial grade.

In the northern sector, a total of seven diamond-drill holes explored the granite contact and the adjacent acid volcanics under the swampy ground. It was reported that results of operations were not encouraging and work has been suspended.

Monpas Mines Limited

The Monpas property is located in the northeastern corner of the map-area and includes lots 32 to 35, and the south halves of lots 36 to 39, in range IV of Landrienne township, and within the map-area, the south halves of lots 32 to 38, range III of Duverny.

Previous to exploration by the present owners, the original discovery was made about 1,400 feet south of the range-line separating ranges

III and IV, on lot-line 33-34. This exploration consisted of trenching and sampling in the immediate vicinity of the surface occurrence.

The present owners, under the direction of Dr. S.E. Malouf, company geologist, completed, during the 1945-1946 seasons, 6,000 cubic feet of surface trenching, a magnetometer and geological survey, and 5,356 feet of diamond drilling.

Thirteen diamond-drill holes were put down along 1,100 feet of the strike of the Monpas shear zone, which is in lots 33 and 34, 1,320 feet south of range-line III-IV. This shear zone is contained within an agglomerate member of the volcanics, and massive pyrite replacement in the shear zone proper occurs as lenses along an east-west strike and a southerly dip. Sulphide replacement was also apparent in the agglomerate and the scoriaceous flow tops. Company reports show that over narrow footages, assays from 0.41 to 6.38 per cent Cu, from 0.10 to 16.6 per cent Zn, and from 0.31 to 2.66 oz. per ton Ag were encountered along the mineralized horizons.

Exploration work is at present suspended.

Norhill Gold Mines Limited

This company holds a large acreage astraddle range-line II-III, comprising lots 34 to 45, the south halves only, and the north halves of lots 33 to 44, range II of Duverny township.

To date, no exploratory work other than superficial examination has been done on the property.

Trans-Duverny Gold Mines Limited

The property of this company includes lots 15 to 26, range I of Duverny township.

Company officials report that a programme of exploration is now under way to test the carbonate zone which traverses the property for a distance of 6,000 feet and up to 600 feet in width. This zone is sparingly mineralized with pyrrhotite, pyrite, graphite, and minor chalcopyrite. Samples taken by the author yielded low tenors of nickel and copper.

Yeoman Gold Mines Limited

This company holds the ground comprising lots 19 to 26, range X of Landrienne township. No exploration is apparent on the ground and outcrops are very scarce.

ASBESTOS PROSPECTS

Paramount Mining and Developing Syndicate Limited

This syndicate is the largest holder of potential asbestos-bearing serpentinized peridotite in the Landrienne area. These holdings consist of a number of small groups of claims as follows: lots 61 to 64, south halves, range X in Figuery township, and within the map-area, the south halves of lots 9, 10, 15, 16, 17, and 18; lot 11, range X of Landrienne township, and lots 30 to 37, range IX of Landrienne.

The exploration, which has been under the direction of W.R. Sutton, company engineer, has consisted of geological investigation of the entire property.

Further plans for exploration are under consideration.

Johnson's Company Limited

This company holds a small group of claims which include the south halves of lots 1 and 2, range X, and lots 2 to 9, range IX of Landrienne township.

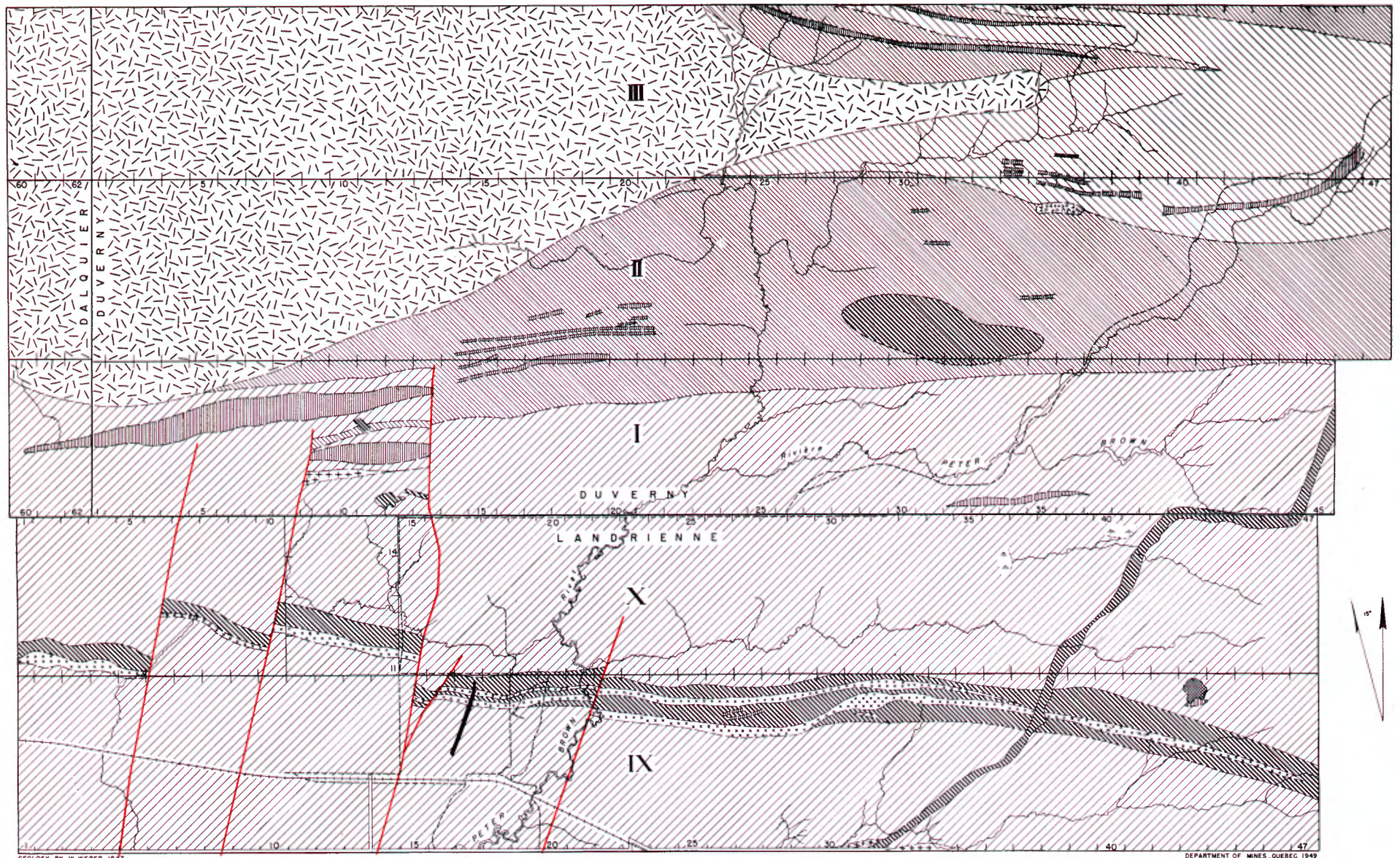
At the time of the writer's study of the area, diamond drilling had commenced in the serpentinized peridotite adjacent to lot-line 1-2, in range X of Landrienne. Approximately 500 feet of core had been drilled, and it was reported that the core in part represented possible ore.

Lots 23 to 29, Range IX, Landrienne Township

This ground was formerly held by the Erickson-Murray interests.

A number of small trenches in serpentinized peridotite have revealed good indications of chrysotile fibres of possible ore-grade in the exposures on lots 27 and 28, adjacent to the lot-line and 1,800 feet south of range-line IX-X.

To the south of the asbestos occurrence, massive sulphides replacing tuffs and intermingled with iron formation have also been trenched. The mineralization is mainly pyrite with minor chalcopyrite, and samples taken by the writer failed to show indications of ore mineralization.

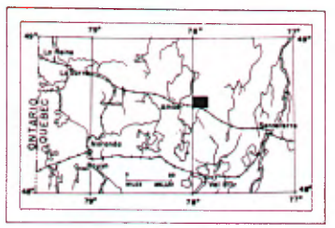


VOLCANIC ROCKS (Keewatin-type)
ROCHES VOLCANIQUES (Type-keewatin)

- Acidic to intermediate lavas, Rhyolite
  Laves d'acide à intermédiaire, rhyolit
- Trachyte
  Trachyte
- Dacite
  Dacite
- Andesite and basalt
  Andésite et basalte
- Fragmental lavas, breccia and tuffs
  Laves fragmentaires, brèches et tufs

INTRUSIVE ROCKS – *ROCHES INTRUS*

- Granite
  Granite
- Granodiorite
  Granodiorite
- Diorite
  Diorite
- Peridotite, serpentine, pyroxenite
  Péridotite, serpentine, pyroxénite
- Gabbro
  Gabbro
- Diabase (Keeweenawan-type)
  Diabase (Type-Keeweenawien)
- Fault
  Faille



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GEOLOGY BY W. WEBER 1947.
GEOLOGIE PAR W. WEBER 1947.

DEPARTMENT OF MINES, QUEBEC 1949
MINISTÈRE DES MINES, QUÉBEC 1949

PARTS OF LANDRIENNE AND DUVERNY TOWNSHIPS
PARTIES DES CANTONS LANDRIENNE ET DUVERNY

COUNTY OF ABITIBI-EAST — No. 781 — COMTÉ D'ABITIBI-EST

Preliminary Map — Carte Préliminaire