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Preliminary report on Normétal mine area, Abitibi county

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PRELIMINARY REPORT

ON

NORMETAL MINE AREA

ABITIBI COUNTY

by

Carl Tolman

QUEBEC
1942

M-339

P. R. No. 170

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INTRODUCTION

The Normetal Mine area examined by the writer during the summer of 1941 comprises about 20 square miles centred at the Normetal mine and includes the eastern half of ranges IX and X, Desmeloizes township, and of ranges I and II, Perron township. The surface geology was mapped by plane-table on the scale of 400 feet to one inch. The southern half of the area is included in the Desmeloizes area mapped by Mawdsley (1) and the northern half is within the Perron-Rousseau map-sheet (2).

The area is accessible by roads from the south. The Normetal mine on lots 43 and 44, range X, Desmeloizes township is serviced by the Company's spur line from Dupuy, on the Canadian National railway.

GENERAL GEOLOGY

The dominant rocks of the map-area are various volcanics of Keewatin type. Intruding them

(1) Mawdsley, J.B., Desmeloizes Sheet; Geol. Surv. Can., Map 284A, 1933. Desmeloizes Area, Abitibi District, Quebec; Geol. Surv. Can., Sum. Rept., 1928, pp. 28C-82C, 1930.

(2) Flaherty, G.F., Perron-Rousseau Sheet (West Half), Geol. Surv. Can., Map 483A, 1939.

are early Precambrian dioritic bodies, late Precambrian granites and granite dykes, and, youngest of all, diabase dykes.

Volcanics

The volcanic rocks of the area include rhyolite, dacite or 'grey lava', andesite, and banded tuffaceous sediments. Associated with these are some narrow bands of iron formation.

The rhyolites form a conspicuous band about 2,000 feet wide trending northwest diagonally across the central part of the area. The most distinctive feature of these rocks is their high degree of sericitization; commonly they appear to consist of little else than sericite and quartz. Much of the rock contains quartz 'eye' which in places are opalescent.

Bordering the rhyolites on the southwest is a band of laminated sedimentary rock, probably of tuffaceous origin. It attains its maximum thickness of about 150 feet just north of the Normetal mine. The rock is heavily sericitized and originally it probably had the composition of feldspathic sandstone, tuff, or silt. Yet farther southwest are the dacitic schists and agglomerates and minor amounts of other rocks that constitute the country rock of the Normetal orebody.

Southward from the band of sediments, the area is underlain by rocks that have been mapped as dacite. They range from tuffaceous and agglomeratic types to thick, massive flows. Some show quartz visible to the naked eye. The term 'grey lavas' adequately describes their field and hand-specimen appearance, which contrasts with the light-coloured rhyolites on the one hand and the andesites or 'greenstones' on the other. Interbedded with the dacite are two relatively thin bands of andesite and some iron formation. Northeast of the rhyolite band,

also, there is some dacite, but it is characterized by narrow interbeds of rhyolite. It is to be noted that, on the accompanying map, the siliceous agglomerate and associated schists and rhyolite representing the country rock of the Normetal orebody are incorporated with the dacites.

Two series of bands of iron formation are interbedded with the dacitic lavas in the southwestern part of the area. The individual bands are never more than a few feet thick. One series is in the northern part of range IX and the other is in the central part of range X, Desmeloizes township. The rock is fine grained and consists essentially of quartz, with subordinate magnetite. A fine lamination is produced by the alternation of layers composed of different proportions of these constituents.

Andesites are the dominant lavas in the northern part of the area. Many of the flows are amygdaloidal. Within the andesite in the northwestern corner of the area there are some sill-like bodies of quartz porphyry. These are thought to be intrusive, but it is possible they are interbedded flows. As already noted, two mappable bands of andesite occur within the dacitic rocks of the southwestern part of the area. The northernmost band is at least 300 feet wide and consists largely of massive andesite. In the other band, about 600 feet wide, the rock is generally finer grained and more schistose.

Diorite, Quartz diorite

Intrusive rocks of dioritic composition and texture are found within the lavas in various parts of the area, but only in a few places are the occurrences sufficiently large and well defined to be shown on the map. They generally resemble the associated lavas in appearance, and in places it is difficult to distinguish them from the latter. Two of these bodies in range IX and two in range X,

Desmeloizes township, are shown on the map. One of those in range X is about 60 feet wide and is noteworthy in that it parallels, about 40 feet southwest, the Normetal orebody. The rock is quartz-bearing and has been described as granite. Microscopic examination may support such a classification, but the appearance of the rock as seen in the field and in hand specimen suggests an altered quartz diorite. Two small, isolated outcrops of massive rock of dioritic appearance have been mapped in the northeastern part of the area. These, however, may represent andesite metamorphosed by the body of granite that intrudes the lavas in their vicinity..

Granite

Granite occupies the northeastern part of the map-area and probably extends beyond its boundary to the north. It is grey in colour, relatively fresh appearing, high in quartz and low in dark mineral. The quartz shows a tendency to be opalescent. A number of dykes of porphyritic albite granite with maximum width of four feet intrude the dacitic volcanics along a zone just south of the Normetal mine. It cannot be said definitely whether these rocks are related to the granite of the northeastern part of the area, but their megascopic appearance suggests that they may be. Reference has been made to quartz porphyry within the andesite in the northwestern part of the area. The suggestion that these bodies are genetically related to the granite is supported by the opalescent character of the quartz in both rocks. However, the quartz porphyry gives the impression, through its alteration, that it is older. If so, it could be related to the rhyolite flows, and have come from the same magmatic source.

Late Precambrian Basic Dykes

Basic dykes, of the type regionally distributed in this part of the Province, occur in

several places in the area. They are gabbroic in composition, with more or less well developed diabasic texture. They cut all other rocks. It is possible that more than one age of intrusion is represented among them, but no data bearing on this matter was obtained. Thicknesses range from two feet to about 200 feet. The larger ones are shown on the map. The strikes of all these dykes lies somewhere in the northeast quadrant. Most of the very narrow dykes strike due north or very little east of north.

The thickest and most conspicuous of these basic dykes extends northeasterly across the northwest part of the map-area. Another, in the central part of the area, in range I, Perron township, trends almost due east-west, and a similar dyke of about the same width, lying along the same line of strike, occurs at the western boundary of the area, in range X, Desmeloizes township. At the east side of lot 45, range I, Perron township, a small outcrop of gabbro occurs which resembles the 'Normetal' dyke encountered in underground operations at the mine. If it represents, the northward continuation of the latter, the strike of the dyke would be N. 15°E. In the mine, the dyke is about 200 feet wide. Southward from the mine workings, no exposures of this dyke are found within the map-area, but beyond, a similar dyke is exposed, with a like trend. The Normetal dyke appears to be definitely later than the metallic mineralization at the mine.

Miscellaneous Intrusives

The obscure quartz porphyry bodies in the northwestern corner of the map-area, and the zone of porphyritic albite-granite dykes just south and west of the Normetal mine, have already been mentioned. In addition, small basic dykes, collectively referred to in the field as lamprophyres, were noted

in various places within the volcanics. They range up to three feet in width and usually occur in swarms, with strike parallel to the structure. They are most prevalent in the dacites of range IX, Desmeloizes township. Also, small, fine grained intrusive bodi , generally irregular in outline and greatly altered, are exposed on the surface and underground in the vicinity of the Normetal orebody. They are intermediate to basic in composition and, because of their great alteration and irregularity in outline, they are not easily distinguished from the other rocks, predominantly volcanics, in which the orebody lies. Some of the rhyolite associated with the Normetal mineralization may be intrusive.

STRUCTURE

The rocks of the area dip steeply, generally at about 80°, to the northeast. The general strike is northwest, becoming north-northwest in the northwestern part of the area. Available data indi cate that the structure is a monocline, and that th. tops of the beds face to the south. The best structural determinations were obtained in pillows in dacitic flows in the southern part of range I, Perron township, near the central part of the map-area, and at the southern border of the map-area east of the transmission line. These observations are supported by some generally distributed but less definite determinations on pillows, gradation in grain relations, and flow cleavage-bedding relations.

Small faults offsetting dykes and contacts a few feet can be seen in many places, but no evidence of large displacements was found on the surface. Underground in the Normetal mine, the orebody is seen to be offset about 150 feet to the left by faulting along the Normetal late-Precambrian basic dyke. The distribution of the outcrops of the prominent basic dyke in the northwestern part of the area suggests that the dyke has been offset by faulting or that

it is quite sinuous in trend. Detailed mapping of the outcrops indicates that the latter is more probable.

ECONOMIC GEOLOGY

The prevailing type of mineralization found in the area is represented by replacement deposits, essentially of pyrite with appreciable amounts of chalcopyrite and sphalerite, along shear-zones that generally parallel the regional structural trend. Only at the mine of the Normetal Mining Corporation, on lots 43 and 44, range X, Desmeloizes township, has sufficient concentration of valuable metals been encountered to warrant development and mining. Currently, about 700 tons of ore per day are being mined and milled. Plans are under consideration to increase the output. Copper, zinc, and small values in gold and silver are recovered. The mine is opened to the 2,000-foot level, and the strenght of the mineralization has been well maintained to this depth.

The immediate country rock of the Normetal orebody consists of siliceous agglomerate, sericite and chlorite schists (probably representing tuffaceous material), rhyolite, and some fine grained intrusives of intermediate to basic composition and irregular outline. The siliceous agglomerate, about 25 feet wide on the surface, was the rock most favoured for replacement by the mineralizing solutions, and the orebody, of tabular shape, is largely confined to it. The fine grained intermediate to basic intrusive rock was the least affected, and barren or little mineralized bodies of such rock tend to interrupt the continuity of the orebody. The orebody is paralleled about 40 feet to the southwest by a sill-like intrusion of quartz diorite, about 60 feet wide. An interesting feature of the geological setting is the 'Normetal' dyke of diabase, about 200 feet wide with hortherly trend, which intersects the orebody.

Movement on a fault along the dykes appears to have offset the orebody about 150 feet to the left.

The general strike of the deposit is about N. 65°W., with dip 80°N.E. Three orebodies are distinguished. No. 1 and No. 2 are parallel and, on the surface, are about 50 feet apart, but they gradually converge and finally unite to form one orebody below the 550-foot level. The maximum length along the strike that ore has been developed in these bodies is about 800 feet. Widths are variable but commonly 20 to 30 feet. No. 3 orebody is east of the Normetal dyke and appears to be an extension of the mineralization of orebodies No. 1 and No. 2 that has been offset to the left about 150 feet by movement along the dyke.

The dominant metallic minerals of the deposit are pyrite, chalcopyrite, and sphalerite. Streaks of pyrrhotite can be seen in the massive chalcopyrite and they seem to be more prevalent with depth. Rarely, the ore contains a small amount of galena. No. 1 orebody, lying to the northeast of No. 2, is relatively rich in chalcopyrite, while No. 2 is relatively rich in sphalerite. Where the two bodies merge, the relationship continues, resulting in a relatively high concentration of sphalerite along the footwall and of chalcopyrite along the hanging-wall. In fact, there is a well marked tendency for each of the major sulphides - pyrite, chalcopyrite, and sphalerite - dish to occur separately, both as massive and disseminated replacement bodies, rather than together, as intimate mixtures of all three. No. 3 orebody has been little developed and has only been opened on a few levels.

Wall-rock alteration involved the production of sericite, carbonate, and chlorite. Locally, garnet and biotite were formed as well as some other minerals, identification of which will have to await microscopic study. Little quartz accompanied the mineralization.

Just northwest of the Normetal mine, in the north half of lot 43, range X there is a pyritized shear trending about N.65°W. It is reported that diamond drilling of this shear by the Central Mining Corporation intersected considerable massive pyrite. It would be interesting to trace this mineralization into the region of its intersection by the Normetal dyke.

Another well defined pyritized zone occurs in the southern part of range I, Perron township, on land controlled by Ventures, Limited. It may well persist eastward to the region of the dyke.

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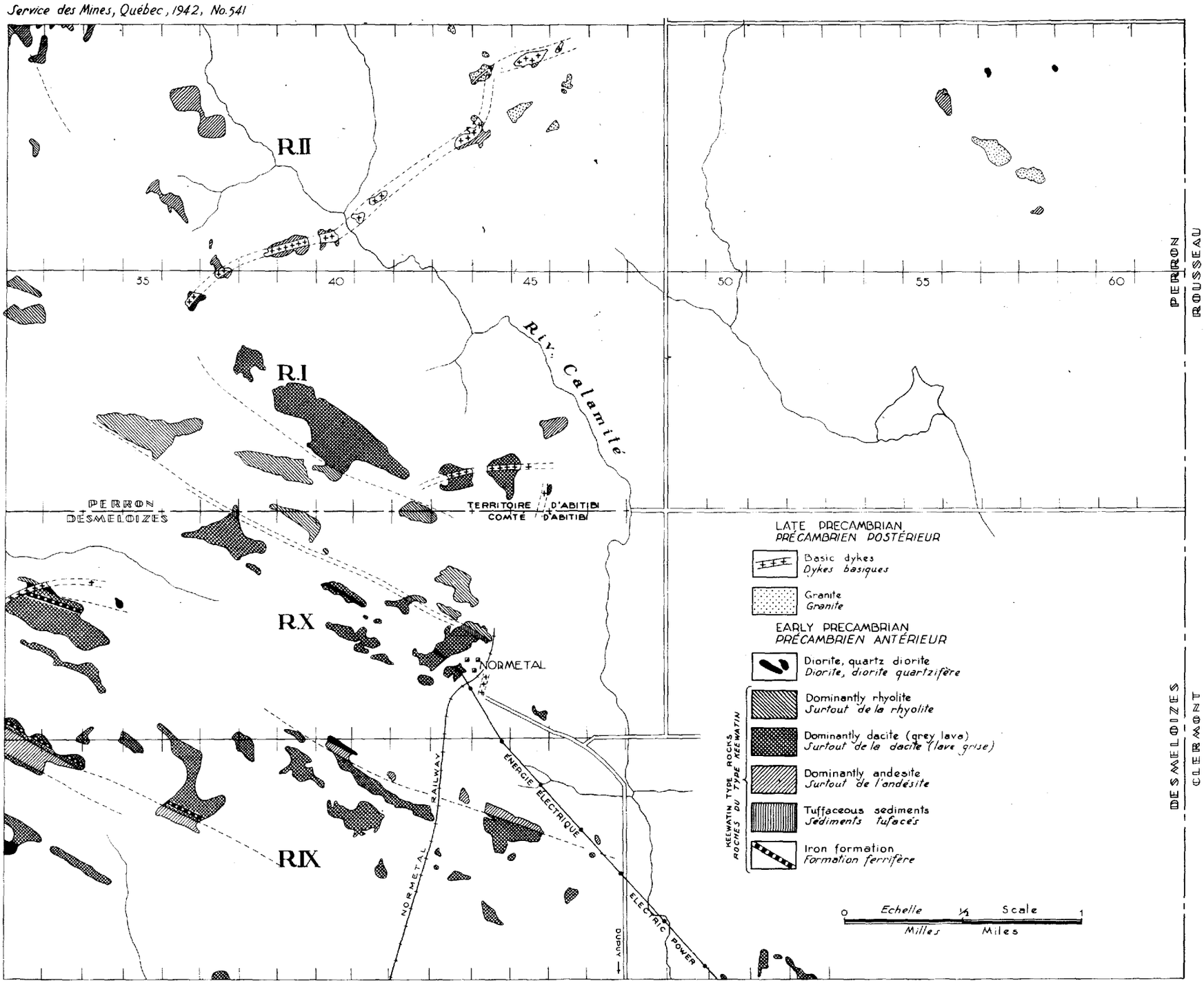

Géologie par Carl Tolman, 1941

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Région de la Mine Normetal
Comté d'Abitibi

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