Province of Manitoba

DEPARTMENT OF MINES AND NATURAL RESOURCES

MINES BRANCH

PRELIMINARY REPORT 47-1

on the

GEOLOGY OF THE

WALLACE LAKE AREA

RICE LAKE DIVISION
Manitoba

by

G. A. RUSSELL

(Preliminary Map 47-1 in pocket)

Winnipeg

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INTRODUCTION

LOCATION

The area included in the Wallace Lake Sheet comprises about 192 square miles in the central Manitoba mining district. The area is bounded on the east by longitude 95° 15' W, on the west by longitude 95° 30' W, on the south by latitude 51° 00' N, and on the north by latitude 51° 15' N. The geographical centre of the sheet is located 118 miles, N 45° E from the city of Winnipeg, and 15 miles, N 62° E from Bissett, Manitoba. The eastern limit of the sheet is 4 miles west of the Manitoba-Ontario Provincial Boundary.

ACCESS

The nearest town, Bissett, Manitoba, may be reached by air from Lac du Bonnet and by a combined water and overland route from Winnipeg via the Red River, Lake Winnipeg, the Wanipigow River and finally motor-coach from Government Landing. From Bissett the motor road to Long Lake passes within two miles of the southwest tip of Wallace Lake. A branch road leads from the main road to Conley Bay on Wallace Lake. The main road is under construction and in many places it has been built over heavy glacial clay which, when wet, renders the road impassable to any powered vehicle but tractors.

The south one-third of the area is readily accessible from Wallace Lake and the Wanipigow River east and west of the lake. The central one-third of the area may be reached by canoe via the Wanipigow River, Broadleaf River and a chain of lakes and creeks leading to within one mile of the geographical centre of the area. This same chain of lakes and creeks also leads to a point within one mile of the south shore of Aikens Lake from which the lake may be reached by an 80-chain portage.

The north one-third of the area is accessible from Aikens Lake and the Gammon River east and northwest of the lake.

The Wanipigow River and Gammon River are well-traveled canoe routes, with numerous short, clean, portages. The Broadleaf River is not well-traveled, has numerous short, poorly cut-out portages and several shallow gravel flats.

GENERAL CHARACTER OF THE AREA

Topographically the area is similar to other parts of the Canadian Pre-Cambrian Shield and consists of low, rocky hills separated by areas of muskeg, swamp or a thin layer of glacial deposits consisting usually of sand with small amounts of gravel. A few irregular boulder deposits and some large erratics were noted. In some areas a mantle of gumbo clay covers the rock surface.

The north one-third of the area is drained by the Gammon River which flows west into Lake Winnipeg. The south two-thirds of the area is drained by the Wanipigow River, (including its tributary the Broadleaf River) which also flows west into Lake Winnipeg.

In the west one-half of the area, rock outcrops are abundant but usually covered by a layer of forest fire debris and windfalls over which a thick second growth of small jackpine and poplar has grown to a height of from six to twelve feet. In the east one-half of the area, extensive, wet, muskegs (with tamarack) and sand plains (with jackpine) cover much of the underlying rock.

The rivers and lakes have numerous jack-fish, some pickerel, and Aikens Lake is reported to have abundant trout. Moose are plentiful in the swampy east-central portion of the area. A few deer were seen along the Wanipigow River and occasional small herds of caribou are known to traverse the area. Partridge are fairly plentiful and since many of the lakes have extensive rice beds, ducks were noted everywhere. Fur-bearing animals known to be present are beaver, muskrat, otter, fisher, fox and mink.

GENERAL GEOLOGY

All of the consolidated rocks of the area are of Pre-Cambrian age. The general geology may be summarized in the following table of geologic formations, the oldest rocks appearing at the bottom of the table and the youngest at the top.

TABLE OF FORMATIONS

Late Intrusive Series		Lamprophyre dykes Aikens Lake Granite--vein quartz, pegmatite, aplite and pink porphyritic granite. Medium to Basic Intrusives -- Manipigow diorite, quartz diorite, gabbro, and amphibolite.
Intrusive Contact		
Early Intrusive Series		Wallace Lake Granite--grey, biotite granite, in large part gneissic and with many remnants of the Sedimentary-Volcanic series--quartz porphyry dykes (?)
Intrusive Contact		
Sedimentary-Volcanic Series	Sedimentary Group	Arkose, Greywacke, quartzite, and conglomerate (some beds garnetiferous)
	Intermediate Group	Chert, ferruginous chert, siliceous limestone, limestone, graphitic slate, iron formation and vesicular and amygdaloidal lavas.
	Volcanic Group	Pillow lavas, andesite, porphyritic andesite, some iron formation, slate and tuff--rare garnetiferous-chlorite-schist and andalusite-chlorite schist.

SEDIMENTARY-VOLCANIC SERIES

The oldest rocks in the area are included in this series. The series may be roughly divided into two groups, one predominantly sedimentary (arkose, greywacke, quartzite etc.), the other predominantly volcanic (pillow lavas, andesite etc.). The contact between these two groups is transitional rather than sharp and reflects a gradual change in geological environment. The rocks comprising the transition zone have been included in the Intermediate group.

VOLCANIC GROUP

This group includes pillow lavas, massive, strongly-jointed andesitic and basaltic flows and thin-bedded andesitic tuffs. Thin bands of iron formation and some slaty layers occur erratically through this succession. On the map it will be seen that the most prominent occurrence of these "greenstones" is along the long axis of Wallace Lake.

Other areas of outcrop of the Volcanic group were observed in the northern part of the map-area. Here, however, the volcanic rocks are merely remnants in the large areas of granite and granite-gneiss. The "greenstones" show all stages of injection and assimilation, chiefly by the granites of the Early Intrusive series. The resulting hybrid rock is frequently seen to be cut by the various members of the Late Intrusive series. Fragments of all the rocks occurring in the main belt of "greenstones" at Wallace Lake were observed in the areas of the Wallace Lake inclusion-bearing granite and granite-gneiss.

INTERMEDIATE GROUP

This group includes vesicular and amygdaloidal lavas, chert, ferruginous chert, ferruginous quartzite, siliceous limestone, limestone and iron formation. Due to the complexly folded nature of the rocks at Wallace Lake and to the presence of swamp and overburden in critical areas, it was not possible, on the scale of the present work, to work out the succession accurately. Most of the rocks may be seen on the northwest side of Big Island, especially at low water.

While it has not been possible to define absolutely the succession in the Intermediate group, the general relationship of these rocks to the Volcanic group and to the Sedimentary group has been of great assistance in determining the structural picture at Wallace Lake.

SEDIMENTARY GROUP

This group includes quartzite, arkose, greywacke and conglomerate. Interbedded with these sediments are some lava flows that indicate continuing volcanic activity.

The occurrences of conglomerate require special note because of the significance of these rocks in studying the stratigraphic succession. The only prominent occurrence of conglomerate which was noted was on the west shore of the southwest arm of Wallace Lake, across from the old Conley Camp. Here, pebbles of granitic rock occur in a thinly-banded matrix. An attempt to trace this conglomerate was unsuccessful. This is to be expected in view of the complex folding of the rocks at Wallace Lake which no doubt has been accompanied by thickening and thinning of individual beds. Where a particular strata can not be traced almost continuously it is mapped only as isolated outcrops.

A further complication to the conglomerate problem is introduced by the presence of inclusion-bearing dykes which belong to the Medium to Basic Intrusives of the Late Intrusive series. In every case, the inclusions in these dykes were rounded to subrounded "pebbles" or "cobbles" of granite. Shearing, later than the Medium to Basic Intrusives, has in some places obscured the igneous nature of these inclusion-bearing dykes. Thus, except for a few irregular lenses of conglomerate noted on the Gatlan property, the presence of much conglomerate must be regarded as tentative.

INTRUSIVE ROCKS

Before discussing any of the intrusive rocks of the area, it should be noted that all of the various intrusives were not observed in contact with one another, in which case it would have been possible to determine their relative ages by crosscutting, chilling etc. Due to the great importance of the relative ages of the various intrusives with respect to the main period of the mineralization, special attention was paid to areas where field data, concerning relative age relationships, might be found.

WALLACE LAKE GRANITE

This mass of granite lies between the north shore of Wallace Lake and the south shore of Aikens Lake, and extends across the entire width of the map-area. In a field survey, made on a scale of 1 mile to 1 inch, it was impossible to show the true characteristics of this granite. An attempt has been made to outline an area in which the granite is relatively uncontaminated by inclusions. These inclusions vary in size from one or two inches up to one or two miles and show all stages of injection and assimilation by the granite.

Typical, uncontaminated granite is grey to greyish-white and medium- to coarse-grained. The rock consists of white to buff coloured sodic feldspar, quartz and varying amounts of dark minerals, usually biotite.

Outside of the are where Wallace Lake granite is relatively uncontaminated by inclusions, lie areas of hybrid rocks varying from granite-gneiss to granitized sediments. The latter are particularly prominent in the area south of the Wanipigow River, and west of Wallace Lake. In this area of granitized sediments (chiefly arkose) some bands of little-altered sediments occur.

QUARTZ PORPHYRY

Another prominent feature of this area is the presence of dykes of quartz porphyry which have prominent phenocrysts of blue-quartz. Much of the country rock of these porphyry dykes also shows the blue-quartz "eyes". This area of granitized sediments to the west of Wallace Lake was the only place in the area mapped in which the phenocrysts of blue-quartz were observed.

The age of the quartz porphyry dykes is not definitely known. Further, there is no assurance that the blue-quartz "eyes" that occur in the granitized sediments have the same origin as the blue-quartz phenocrysts that occur in the quartz porphyry dykes. At one place on the south shore of Wallace Lake west of the Conley residence, a prominent dyke of amphibolite has intruded close to the contact between greenstones and quartzites. The quartzite near the dyke has numerous blue-quartz "eyes" but farther south the number of "eyes" is considerably less.

The determination of the origin of some of the fine-grained rocks containing blue-quartz "eyes" will require detailed microscopic study.

AIKENS LAKE GRANITE

This rock outcrops in the west-central and northern parts of the area, the type locality being located at the point where the Gammon River enters Aikens Lake. The granite has a uniform appearance in the field and consists of medium to large phenocrysts of pink feldspar in a granitoid groundmass made up of orthoclase and quartz with varying amounts of dark minerals which may be biotite or hornblende or both. The phenocrysts range in size from one-half inch to two inches across. The rock has aplitic and pegmatitic phases and it is believed that many of the pink aplite and pegmatite dykes occurring throughout the whole area are related to this granite.

Coarse-grained pegmatites associated with the Aikens Lake granite were examined in detail for commercially valuable minerals. None were found during the present survey.

OTHER GRANITE INTRUSIVES

The south border of the map-area includes a small portion of a granite mass of large areal extent lying to the south of the Wallace Lake Sheet. The rock did not occur in contact with any of the other granite masses, that is the Aikens Lake granite and Wallace Lake granite, so its age with respect to these rocks is unknown. The rock consists of pink feldspar, quartz and varying amounts of dark minerals, usually hornblende. In the field and in the hand specimen, the rock strongly resembles the Aikens Lake granite and so, for the purposes of this preliminary report, the rock is being referred tentatively to the Aikens Lake mass.

The pegmatitic, aplitic and porphyritic character of the Aikens Lake granite, at Aikens Lake, plus the presence of so many inclusions, would seem to indicate a high batholithic level while the more uniform, even-granitoid texture and lack of inclusions in the granite at the southwest corner of the sheet seems to indicate a lower batholithic level. Perhaps the two granites; that is, at the southwest corner of the map and at Aikens Lake, are related in this way. Detailed laboratory work will attempt to correlate the masses.

CONTACT ZONE

This zone is indicated on the map in the vicinity of and south from Aikens Lake. The area was mapped as a zone because it was impossible, on the scale of the present survey, to show it in more detail.

Under the description of the Aikens Lake granite, it has been stated that there are pink aplite and pegmatite dykes throughout the entire area. In the Contact zone they are very abundant. There are also extensive outcrops of Aikens Lake granite in this zone.

To describe the Contact zone properly is to name the various rock types of which it consists. The most abundant rock is Wallace Lake granite which is, however, quite different from that which occurs in the type areas and here is considerably richer in ferromagnesian minerals, biotite and hornblende, and contains many fragments of the Sedimentary-Volcanic series including andesite, pillow lavas, porphyritic andesite and iron formation. Thus, the "matrix" of the Contact zone is a hybrid rock made up of Wallace Lake granite with many inclusions of all sizes and representing all stages of assimilation.

Near the outer southern rim of the Contact zone, a few widely separated stringers of pink aplite and pegmatite cut across the hybrid matrix of the zone. Going northward from the southern contact, the amount of aplite, pegmatite and pink porphyritic granite (Aikens Lake granite) increases until at and around the south shore of Aikens Lake the Contact zone is made up chiefly of these later intrusives, there being only scattered remnants and inclusions of the inclusion-bearing Wallace Lake granite.

Still farther north, around the north shore of Aikens Lake and northwestward and southeastward from the lake, the Contact zone shows a marked increase in the amount of Aikens Lake granite until finally there are no more inclusions of Wallace Lake granite.

Northward from Aikens Lake, inclusions of Wallace Lake granite are again found in the pink porphyritic Aikens Lake granite and near the upper part of the map-area the latter again has inclusions of the Sedimentary-Volcanic series.

MEDIUM TO BASIC INTRUSIVE ROCKS

This group of rocks is represented by one fairly extensive intrusive mass and a large number of dykes. The rocks range from quartz diorite to peridotite in composition. The position of this group of rocks has been tentatively established but there is still some doubt as to the exact age relations of the various members of the group due to the fact that they have not been found occurring in contact with one another.

WANIPIGOW DIORITE

This rock outcrops extensively in the southwest and west-central portions of the area as a large "L"-shaped intrusive mass, here named the Wanipigow diorite. The north tip of the "L" is north of Leaf Lake and the angle of the "L" is on the Wanipigow River south of its junction with the Broadleaf River. The exact location of the east tip of the "L" is not known due to extensive swamp and overburden.

For the purposes of this preliminary report, the composition of the Wanipigow diorite mass will be considered to be diorite although it is well known, from field facts, that at some places the rock is definitely more basic and would be classed as gabbro or even peridotite.

In addition to an inherently complex make-up the large diorite mass is cut by later dykes of quartz diorite and darker lamprophyres. At some places the diorite mass shows angular fragments of amphibolite while only a short distance away the diorite and amphibolite are interbanded.

North of the Jeep property, the diorite mass contains inclusions of Wallace Lake granite. These occurrences supplied part of the evidence for determining the position of the diorite in the geologic column.

AMPHIBOLITE

This rock varies from medium-to fine-grained to a very coarse-grained texture in which some of the crystals are one and one-half to two inches long. There is no doubt that microscopic examination of specimens of this rock will show a variation in composition but the name amphibolite was considered satisfactory for a field term.

The rock occurs both as fragments and as bands in the Wanipigow diorite. Nearly the whole length of Leaf Lake lies in amphibolite as is shown by almost continuous outcrops of this rock at the edge of the water on the east shore while higher up the rocks are granite.

In the vicinity of Aikens Lake several prominent, dyke-like bodies of amphibolite occur. On the east shore, north of the East Arm, the rock appears to occur as a true dyke, but in most of the other occurrences the amphibolite seems to occupy irregular tears in the granitic country rocks. In the latter case the amphibolite contains numerous inclusions of the granitic rocks. These inclusions may range up to one foot across, but in many places the breaking-up of the granitic inclusions has been so complete that the amphibolite appears to have "phenocrysts" of pink feldspar, the dark minerals of the granite having merged with the dark minerals of the amphibolite. Glassy quartz veins were observed cutting the dyke-like mass of amphibolite referred to above as occurring north of the east arm of Aikens Lake.

QUARTZ DIORITE

This rock is the third most prominent member of the group of Medium to Basic Intrusives. It has been found as a dyke cutting the Wanipigow diorite, just east of the property of Jeep Gold Mine Limited, and as a dyke cutting amphibolite on the east shore of Leaf Lake. There are indications that a similar rock has been intruded along the Wallace Lake fault.

LAMPROPHYRE DYKES

Many lamprophyre dykes were noted. They occur most abundantly in areas close to the Wanipigow diorite. Most of the dykes have an approximate northwest-southeast strike. Some dykes contain rounded inclusions of the granitic country rock in which they occur. No inclusion-bearing lamprophyres were noted in the Aikens Lake granite or the granite mass in the southwest corner of the map-area. At least one dyke is known to intrude the Wanipigow diorite.

One large lamprophyre dyke intrudes Aikens Lake granite on the northwest shore of Leaf Lake, just south of the high cliff. Another narrow black dyke, altered to chlorite-schist, intrudes the same granite mass on the west shore of Leaf Lake just north of the high cliff.

STRUCTURAL GEOLOGY

The discussion of structural features of the area will be confined mainly to the Sedimentary-Volcanic series at and west of Wallace Lake. Farther north, in the areas of granite-gneiss and greenstone and sedimentary remnants, the rocks are so complexly folded and so disrupted by the intrusion of two different granites, that on the scale of the present work, it was not possible to develop a complete structural picture.

In this report it has been assumed that the Sedimentary group of the Sedimentary-Volcanic series lies above the Volcanic group. An unsuccessful attempt was made to find evidence indicating the tops of beds. It is realized that any discussion of structure depends fully on the assumption that the Sedimentary group is younger than the Volcanic group.

Originally the Sedimentary-Volcanic series was laid down as a series of flat beds consisting of volcanics at the bottom overlain by rocks of the Intermediate group which in turn were overlain by rocks of the Sedimentary group. The flat-lying formations were then tilted so that they were dipping north at an angle of about 70°. After having been tilted into their north-dipping position the Sedimentary-Volcanic series was folded, then faulted along two major zones of shearing. These can be traced across the entire map-area.

The most northerly of these zones of shearing is located along the north shore of Wallace Lake, and is here named the Wallace Lake fault. It is not one simple fault but a shear zone striking S 65° E with major shearing in a direction parallel to the strike of the zone and with numerous individual shears that angle across the main zone.

The southern zone of shearing passes through and lies partly south of Conley Bay. Hereinafter, it will be referred to as the Conley Bay fault. Over the greater part of its length, within the map-area, the Conley Bay fault is covered by swamp. The south side of the fault zone is, however, marked by an abrupt rocky cliff.

Both the Wallace Lake fault and the Conley Bay fault have been the scene of further movement after their formation. Also, these zones of weakness have been intruded by rocks of the Medium to

Basic Intrusives. The south part of the Wanipigow diorite is aligned along the Conley Bay fault. Several outcrops of diorite, quartz diorite and gabbro have been found along the Wallace Lake fault but due to the intervening water areas, no attempt has been made to join up these occurrences.

While subsequent movement along the Wallace Lake and Conley Bay faults has altered the normal structural relations, there is good evidence to indicate that the structure at Wallace Lake is a large drag-fold that strikes about S 65° E, dips north at about 70° and plunges southeast at about 70°.

The remnants of the Sedimentary-Volcanic series that occur on the south shore and southwest of Aikens Lake, strike about northwest-southeast and dip to the south at 70° (vertical at Aikens Lake but flatter southward from the lake). Combined with the structure at Wallace Lake, the data in the north part of the sheet indicate that a large syncline occurs between Wallace Lake and Aikens Lake. The central (axial) portion of the syncline is now occupied by Wallace Lake granite and all around this granite mass may be found remnants of the Sedimentary-Volcanic series, in all stages of injection and assimilation.

ECONOMIC GEOLOGY

The Wallace Lake and Conley Bay faults at Wallace Lake have been the seat of deposition of a wide variety of minerals. The ore minerals include gold, silver, pyrite, chalcopyrite, galena, arsenopyrite, molybdenite, and sphalerite plus small amounts of scheelite. Gangue minerals include quartz, carbonates and tourmaline. Not all of the ore and gangue minerals occur necessarily at one place.

The minerals listed in the preceding paragraph were deposited sometime after the intrusion and solidification of the Medium to Basic Intrusives. The time of deposition of the quartz veins that occur in the rocks of the Sedimentary-Volcanic series is not as well known. Veins of white, barren quartz occur most frequently in areas adjacent to and between the Wallace Lake and Conley Bay faults but scattered occurrences were noted elsewhere. One prominent vein of barren, white quartz occurs in pink, porphyritic granite (Aikens Lake granite) on the west shore of the northeast end of Leaf Lake.

It seems certain that vein quartz would be associated with all the granite masses of the area. Once the quartz veins were formed, along planes of weakness in the country rock, they would remain as planes of weakness and some of them have been shattered and mineralized by gold-bearing solutions.

While both the Wallace Lake fault and the Conley Bay fault are well-defined planes of weakness, subsidiary shears occur near and between them. It is believed, for example, that the shears, along which gold-bearing quartz veins occur in the Wanipigow diorite intrusive, are subsidiary to the Conley Bay fault.

DESCRIPTION OF PROPERTIES

CONLEY PROPERTY

The main showings are located just west of the west shore of Conley Bay. A series of deep pits and trenches has been put down along the strike of a strong, north-dipping shear (the Conley Bay fault) and some diamond-drilling has been done. Ore minerals present are gold, silver, pyrite, chalcopyrite, galena and sphalerite. The hanging wall of the vein consists of limestone with some thin, cherty and ferruginous layers. The footwall is massive, medium-grained greenstone which is andesitic to dioritic in composition. The hanging wall limestone is about 100 feet thick and is overlain by siliceous, coarse-grained sediments (quartzite--some arkose) with which are interbedded some tuffs and medium-grained sills of diorite or gabbro.

The siliceous, hanging wall sediments have resisted weathering and form an abrupt ridge north of the showings. The softer limestone, particularly along the shear and vein, has weathered rapidly. Thus a pronounced topographic depression has been formed and considerable surface enrichment is evidenced by the presence of heavy gossan, malachite, azurite etc. Diamond-drill results have shown the presence of values over a short lateral distance westward from the lakeshore. The property is inactive at present.

GATLAN GROUP

This property lies on the Wallace Lake fault, on the north shore of Wallace Lake, across from the W.J. Conley residence.

The country rock of the veins is quartzite with which are interbedded numerous, elongated lenses of brown to greyish-brown weathering, garnetiferous rock. The main showings are located on a faulted drag-fold whose attitude is similar to the larger structure previously described. (See Structure). A sill of diorite occurs on the south nose of the drag-fold and shows thickening at the crest and thinning along the flanks.

The main vein strikes S 50° E, dips 65° N and consists of a series of lenticular zones of sericite-schist where the rocks are siliceous and amphibolite-schist where the shear zones intersect the diorite.

The most important ore mineral is arsenopyrite which occurs in a gangue of quartz and sericite-schist. The arsenopyrite is present as (1) coarse-grained, diamond-shaped crystals, and (2) as fine-grained, needle-like crystals. A grab sample of the latter type was taken for assay and yielded 2.70 ounces of gold per ton and 0.08 ounces of silver per ton.

South of the main vein, along the hill just north of the lakeshore, pits have been put down to sample a number of quartz veins occurring in lenticular shear zones in quartzite on the south arm of the drag-fold. Mineralization consists of sparse pyrite and chalcopyrite in a quartz-tourmaline gangue. A grab sample of quartz tourmaline with some pyrite assayed trace of gold.

Some diamond-drilling has been done on this property but the records were not available at the time of the present survey. The attitude of the faulted drag-fold suggests the possibility of a south-easterly rake to the ore occurrences.

It is important to note the difference in character of the shear zones associated with the Wallace Lake fault when they pass from rocks of the Volcanic group to rocks of the Sedimentary group. Southeast from the Gatlan property the shear zones are in greenstones etc. and appear as zones of chlorite-schist. At the Gatlan property the shear zones have passed into quartzite and have a distinct tendency to change from a well-defined zone of schist to a series of narrow, spread-out, weakly-sheared joints (horse-tail pattern). West of the Gatlan property in the granitized sediments and granite, there is an increasing tendency for the well-defined zone of schist (i.e. when in the greenstone etc.) to be dissipated into many weak, widely-spaced shear zones, and only where some of the shearing has been absorbed by the northwest-trending dykes of the Medium to Basic Intrusives, is any good schist present.

JEEP GOLD MINE LIMITED

This property is controlled by San Antonio Gold Mines Limited. During the present year a two-compartment shaft has been sunk to a depth of 225 feet and exploration work is in progress to investigate the downward extension of gold-bearing quartz veins found at surface.

The veins are located in the Wanipigow diorite, close to the thick portion near the angle of the "L", and strike about S 57° E. The average dip is from 65° to 70° to the north. Many quartz veins occur in the diorite mass but not all of them have gold-bearing mineralization.

ROXY GOLD MINES LIMITED

This company controls a group of claims which surrounds the holdings of Jeep Gold Mine Limited. A surface crew is engaged in stripping and trenching operations. The portion of the Roxy ground that adjoins the Jeep property on the east includes a considerable area of the Wanipigow diorite, and at the present time quartz veins in this mass are being explored.

Pits and trenches have been put down on several quartz-bearing shear zones that occur outside of the mass of Wanipigow diorite, but so far these zones have failed to provide encouraging results. One of these, the Roxy "E" zone, located near the northeast corner of the group, is a remarkably strong break lying within and along a sheared black dyke. The country rock of the dyke is granite or granitized sediments. Mineralization includes pyrite and chalcopyrite in a quartz gangue. At one point, native copper, in the form of tiny leaves, occurs in granular grey quartz and appears to be primary.

ADVICE TO PROSPECTORS

In this preliminary report it is assumed that the metals of greatest interest are gold and silver. Several persistent bands of iron formation occur and samples of these bands were taken. The best grab sample showed 36.5 per cent iron.

The belt of sediments and greenstone which occurs across the southern part of the map-area is the best place to prospect for two reasons; first, good structures are available and second, there are occurrences of rocks of the group of Medium to Basic Intrusives which, at Jeep Gold Mine Limited and in surrounding areas, appear to be definitely favourable to the occurrence of gold-bearing veins. Until more detailed laboratory work is done, a definite conclusion cannot be drawn but field data indicate the possibility of a genetic relation between the ore-bearing veins and the magma chamber that supplied the rocks of the Medium to Basic Intrusives.

The area around Leaf Lake, in which rocks of the Medium to Basic Intrusives occur, lacks any but a few poorly defined structures, and certainly nothing comparable to the Wallace Lake and Conley Bay faults at Wallace Lake. Grab samples were taken from some rusty quartz veins in the vicinity of Leaf Lake. Assay results are indicated on the map.

During the field work a special attempt was made to investigate what appeared to be well-defined structures in the north three-quarters of the map-area. It was thought that some of the elongated lakes were an indication of potential mineralized breaks. However, mapping revealed that nearly all of the pronounced topographic depressions were caused by the strike of remnants of the Sedimentary-Volcanic series which occur in the granite, or by the gneiss associated with the Wallace Lake granite. They were not shear zones in the true sense although some movement has taken place. Rocks of the Medium to Basic Intrusives do occur but chiefly along irregular tears that are more or less parallel to the gneissosity of the granite and to the strike of the large remnants of the Sedimentary-Volcanic series.

It is well known that gossan occurrences are commonly favourable indications of the presence of ore veins. However, in the Intermediate group of the Sedimentary-Volcanic series there are numerous iron-bearing minerals and rocks which produce gossans that are not at all indicative of ore mineralization. There is iron-bearing carbonate in the limestone and everywhere this rock weathers to a rusty-brown colour. The iron formation that consists of alternate bands of chert and magnetite does not usually weather to a brown colour but the softer iron formation, such as that outcropping north of Wallace Lake just west of the north-south range line, does weather to a brown colour. Some of the vesicular and amygdaloidal lavas have a large amount of iron-bearing minerals which weather brown.

A great deal of work has been done (pits, trenches etc.) on some of these brown-weathering rocks which have no commercial significance. However, it is not possible to warn the prospector to disregard them entirely because some of them have been proved to carry values. In the latter case the rusty-weathering rocks occur in or near either the Wallace Lake fault or the Conley Bay fault and it is the shearing that is responsible for the presence of values. The best procedure, in order to avoid wasted effort and false encouragement, is to make constant use of a gold pan. During the present field season it was found that if the gossan would not pan, the values were not there.

When testing for gold, by roasting and panning, the prospector should be very thorough if any arsenopyrite is present. It is here recommended that the sample be crushed and panned without roasting until a sulphide concentrate is obtained. This sulphide concentrate should then be crushed and ground to as fine a powder as possible and then roasted on a forge or gasoline stove. The concentrate should be stirred from time to time to make sure that all the sulphide is being oxidized. When the concentrate no longer gives off any white smoke, and the odour of sulphur (or garlic) can no longer be detected, the roasting process is complete. The roasted concentrate should now be ground up and roasted once more before final panning.

Note: the fumes given off from arsenopyrite during roasting are poisonous. Avoid breathing them as much as possible.