

LYNN LAKE AREA - J.D. ALLAN
Report 46-2

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LYNN LAKE AREA

NOTES TO ACCOMPANY PRELIMINARY MAP 46-2

by

J. D. ALLAN

1946

Lynn Lake lies 120 air miles North of the Airways base at Cold Lake, Manitoba which is $1\frac{1}{2}$ miles from the railway at Sherridon. A winter tractor trail is used for hauling heavy freight from Sherridon to Lynn Lake during the winter months. The water route from Sherridon is long and arduous and seldom used. Most parts of the map-area are fairly readily accessible from the main lakes which are connected by reasonably good portages. Portions of the map-area, notably the western edge, are covered by heavy swamp; extensive deposits of sand and drift overlies many parts of the southwest section.

The elevation of Lynn Lake is approximately 1000 feet, the land rising gradually westward and northward to approximately 1150 feet at Goldsand Lake. The relief in most parts of the area is less than 100 feet. Rock outcrops are relatively scarce, and much of the intervening ground is occupied by muskeg.

The central and southern parts of the map-area are underlain by a series of alternating volcanic and sedimentary rocks named the Wasekwan Series. These rocks are of pre-Sickle age and are considered Early Precambrian. In this map-area the volcanic and sedimentary rocks have been grouped into mappable units, which however, do vary from place to place, and in some cases appear to pass from one unit into another, as one rock type predominates over another.

The volcanic rocks are all fairly similar in lithology, and are differentiated primarily by the rocks associated with them. They are chiefly basic lavas and greenstone, typically massive and fine grained with small needles of hornblende. A common phase is fine grained with phenocrysts of altered feldspar which stand out on the weathered surface. Metamorphism of various degrees has produced hornblende-feldspar gneisses and hornblenite, some of which are very coarse grained. Pillow structures are discernible in the sheared volcanic bands north of Berge Lake, north of Eve Lake, and east of Fraser Lake. Acid lavas are found in a few places in the Ralph-Barbara Lakes belt, and south of Eldon Lake where they are represented by a fine grained greyish rock, probably trachyte. Volcanic breccia (3b) is well exposed on the prominent ridge along the east side of Ralph Lake, and in some excellent exposures west of Berge Lake. 70% of the fragments in this rock are ellipsoidal. Some fragments however are quite angular. The fragments are well aligned and in several outcrops at the south end of Ralph Lake are seen to be plunging at about 60° to the northeast. Average size of fragments is 1" by 2", but some as large as 3" by 16" were observed. Most of the fragments are fine grained and light grey or green in contrast to a darker groundmass. Generally the entire rock is porphyritic with white feldspar crystals about 1/4 inch across, and at places the phenocrysts are more numerous in the fragments than in the groundmass. Higher grades of metamorphism have caused hornblende and feldspar crystals in both groundmass and fragments to increase in size until the boundaries of the fragments are no longer readily distinguishable. Such a phase is to be seen on the east side of Ralph Lake. Although this horizon is mapped as volcanic breccia (3b), there are some massive flows, tuffs, and sediments in it. Rocks believed to be of the same horizon (3), are found north of Lynn Lake, and along the

(p.t.o.)

south end of the sheet. In these bands the breccia is less clearly defined, and the breccia, flow, and tuff appear to be about equally represented and cannot easily be mapped separately. Hornblendite is found in most of the volcanic series. Some is probably metamorphosed flow, but some is undoubtedly intrusive in origin. Pyrite in scattered grains is present nearly everywhere in the volcanic rocks, but is more concentrated, along zones of shearing and alteration where it is usually accompanied by pyrrhotite.

Tuffs occur in all the units (1 to 8). They are generally fine grained grey to green and thinly bedded. In some beds considerable recrystallization has taken place. At some places the tuffs are extensive and can be mapped as a group, but at most places they are only a minor rock type in the map unit. Division 2 is made up chiefly of tuff with associated sediments and volcanics. North of Lynn Lake this unit can be separated into one subunit 2a, which is mainly sediments with some tuff, and 2c, which is tuff and volcanic breccia. Attempting to trace these units to the southwest they appear to pass into 2b, which is made up of tuffs, flows, and sediments, more or less equally represented. Unit 4 is somewhat similar to unit 2, but where best seen south of Eilon Lake, it is a light weathering series which is not typical of unit 2.

The sediments consist of white quartzites, exposed east of Frances Lake, various impure quartzites, greywackes, phyllites, and quartz-mica schists exposed west of Stick Lake, South and east of Lynn Lake a quartz-feldspar-biotite gneiss (6c) appears to be a metamorphosed phase of the Frances Lake quartzites.

The Ralph Lake conglomerate is limited in extent, but some finer fragmental beds are encountered in the quartzites. The conglomerate consists of highly elongated pebbles of volcanic, siliceous, and granitic material in a micaceous matrix. Pebbles average 1 to 2 inches across but may be 12 inches or more in length. The conglomerate does not appear to resemble the Sickle Conglomerate. The Ralph Lake conglomerate may represent an unconformity between the volcanic rocks and the sediments of Ralph Lake. If so, the sediments of division 4a south of Fraser and Eilon Lakes may not correspond to sediments of division 6 as suggested in the legend.

Owing to limited extent of outcrops, contacts are rarely seen, and individual horizons are not easily followed any distance. No definite determinations of tops of formations were made. In the southeast corner of the map-area the beds dip consistently to the northwest, in the Frances-Lynn Lake area the beds dip to the southeast, and in the Ralph Lake vicinity the beds are vertical or dip northwest. The direction of dips and the distribution of rock types mapped, indicate an anticlinal axis trends south west from Berre Lake to Evelyn Lake, and that a synclinal axis no doubt formerly extended from Eldon Lake southwest towards Fraser and Eileen Lakes. This general structural interpretation is in agreement with that determined for the McVeigh Lake Area (G.S.C. Paper 45-14), to which reference is made for a more detailed mapping of the southeast corner of the sheet.

Numerous faults have complicated the structures, but few can be mapped because of the limited outcrops. Several topographic lineations crossing the map-area suggest faults. A good example is marked by a definite scarp running north and south along the west side of the area through Zed and Wee Lakes. Ralph Lake valley is believed to be a zone of considerable faulting, but the actual positions of faults could not be determined.

Extensive areas of granitic rocks (12) occupy the north and the southwest parts of the map-area. These rocks vary from granite and syenite to quartz-diorite and diorite. The

Berge Lake granite body appears to be along an anticlinal axis, and a band of granitic rocks extending from Eileen to Elion Lakes appears to occupy what may formerly have been the trough of a syncline. Two bodies of an older granite (9) now sheared, are present in the southeast corner of the sheet apparently infolded with the volcanics and sediments. Gneissic granite (12a) is exposed over a large area east of Evelyn Lake. Pegmatitic granite (12b) outcrops around the south end of Little Brightsands Lake. Several bodies of altered gabbro and diorite lie east of Lynn Lake, northeast of Fraser Lake, and south of Ralph Lake. At several places exposures of these rocks were found to contain pyrite, pyrrhotite, and chalcopyrite. In the Lynn Lake area geophysical surveying and diamond-drilling by Sherritt Gordon Mines Limited subsequently disclosed the presence of several bodies of sulphides carrying nickel and copper. The nickel is present in the form of pentlandite. The nickel ore-bodies occur in hornblende-rich portions of the altered gabbro. The surface extent of the "A" ore-body at Lynn Lake has been fairly well outlined, but the extent of other known bodies is very imperfectly known. Drift conceals the western contact of the Fraser Lake body of gabbro. The two bodies of gabbro shown south of Ralph Lake may possibly be one continuous body. The small body shown south of Lynn Lake may be of greater extent than indicated. The emplacement of these basic rocks is believed to have been earlier or contemporaneous with that of the granitic rocks. No actual contacts were seen, but some parts of the gabbro bodies show considerable alteration and locally some schistosity, suggesting that there was some deformation and metamorphism after their consolidation. A small body of gabbro southeast of Frances Lake surrounded by granite is highly altered and contains a large amount of sulphides.

Nearly all the rocks of the area are cut by small bodies and dykes of granite, porphyry (13a, 13b) or felsite (13c). Some of these have a schistosity developed continuous with that in the enclosing rocks.

Magnetic deflections are encountered in several places in the area. High deflections - up to 100° - were noted along a line extending northeast from Ralph Lake. These are believed to be caused by a concentration of magnetite in the cherty sediments of unit 4. Lesser deflections were noted in the vicinity of surface outcrops containing a large amount of sulphides.

Gold occurs in several quartz veins in the southeast corner of the map-area. The deposits were diamond-drilled but no work has been performed subsequent to 1942.

Nickel and copper were first discovered in outcrop and in pieces of float in the Lynn Lake area by Sherritt Gordon Mines during the summer of 1943. The nickel occurs as pentlandite associated with pyrrhotite in hornblende-rich portions of an altered gabbroic intrusive. During the past year, the company carried out extensive magnetometer surveys, and completed many thousands of feet of diamond-drilling on the Lynn Lake body. A mining plant is being installed to permit shaft sinking early next spring in order to explore the ore-bodies at depth. Diamond-drilling will be continued during the winter as well as magnetometer surveys on the small body to the south of Lynn Lake, and on the Fraser Lake body. The Comwest Mining Corporation and International Mining Corporation jointly carried out magnetometer surveys on two groups of claims during the summer of 1945. This work is being continued during the winter. God's Lake Gold Mines Limited staked a large group of claims immediately adjoining Sherritt Gordon's Lynn Lake group on the east. This group is now being explored under the technical supervision of Sherritt Gordon Mines Limited. Other claims staked during the winter and summer of 1946 include the A-Y-Z group and the L-H group. The greater part of the non-granite areas of the map-area is covered by mineral claims.