73-P-10-E: The Otter Lake Area (East Half) by W. A. Padgham

INTRODUCTION

The Otter Lake Area (East Half) is situated between latitudes 55° 30' and 55° 45' north and longitudes 104° 30' and 104° 45' west. This area covers 170 square miles straddling the Churchill River about 55 miles north of La Ronge.

GENERAL GEOLOGY

The area is underlain by a northeasterly striking series of highly metamorphosed sedimentary and volcanic rocks. Granite pegmatite, granitic intrusive rocks, and granitic gneisses have been emplaced or developed within the metamorphic rocks.

A layer of distinctive, pink to red meta-arkoses and granulites, one mile wide, strikes diagonally across the northern half of the map area. To the north of this unit lies a group of volcanic rocks including agglomerate, breccia, and flow rocks ranging in composition from rhyolite to basalt. Rocks of intermediate composition, particularly andesite, are the most abundant.

South and east of the meta-arkose lies a broad sequence of grey, quartz-feldspar-biotite gneisses including many lenticular masses of more or less deformed conglomerate. These metamorphic rocks underlie most of Otter Lake. Narrow layers of hornblende-calc-silicate gneiss occur throughout this meta-sedimentary sequence. Such rocks, because of their higher iron content, give rise to sharp, linear, magnetic anomalies on the aerial magnetic map.

Numerous sills and dykes of pink pegmatite, containing predominantly potash feldspar with quartz, cut the quartz-feldspar-biotite gneiss. In places the pegmatite forms 50 to 90 per cent of the outcrop. Pegmatite sills occur less abundantly in nearly all the other units in the map area.

Grey, layered and foliated granitic gneisses occur interbedded with hornblende-calc-silicate gneisses and quartz-feldspar-biotite gneisses along the southeastern part of Otter Lake. Pink and grey granitic gneisses and migmatites are the predominant rock types in the southeastern part of the area occupying the region from Smith

Bay across Mountain Lake to the eastern boundary.

Granitic intrusive rocks are quite rare in this area. They occur as large concordant masses in the southwest corner of the map area and as small irregular masses associated with pegmatite between French and Otter Lakes. Part of a large granite mass juts into the map area along the north boundary where it occupies the area north of Dickens Lake

STRUCTURAL GEOLOGY

The dominant trend is northeasterly but there are two areas where there is considerable divergence from this trend. One is in the layer of meta-arkose which, in the region just north of French Lake, has been strongly folded into a very large "S" shaped fold. Another area of divergence runs east-west across Otter Lake. Here the rocks have been thrown into a large east-west trending monocline. Dips in the cores of these folds are much shallower on the average than those in the rest of the area.

Numerous faults, some of considerable length, are suggested by strong lineaments cutting across the regional grain. Because of a lack of marker beds and the fact that all the probable fault zones are deeply eroded and filled with overburden, it has been impossible to establish either direction or magnitude of the offsets, if any.

ECONOMIC GEOLOGY

Minor sulphide mineralization, mostly iron sulphide, is widespread throughout the area. Most of it is associated with hornblende-calc-silicate gneisses. Traces of chalcopyrite have been found in some of these rocks as well as in the quartz-feldspar-biotite gneisses and in some of the volcanic rocks in the northwest. Narrow discontinuous quartz-calc-silicate veins carrying appreciable amounts of chalcopyrite were examined just north of the head of Norris Bay. These veins are probably replacements of calcareous layers in the strongly metamorphosed quartz-feldspar-biotite gneisses of this area. Pyrrhotite mineralization occurs abundantly along fault zones adjacent to the copper bearing veins.