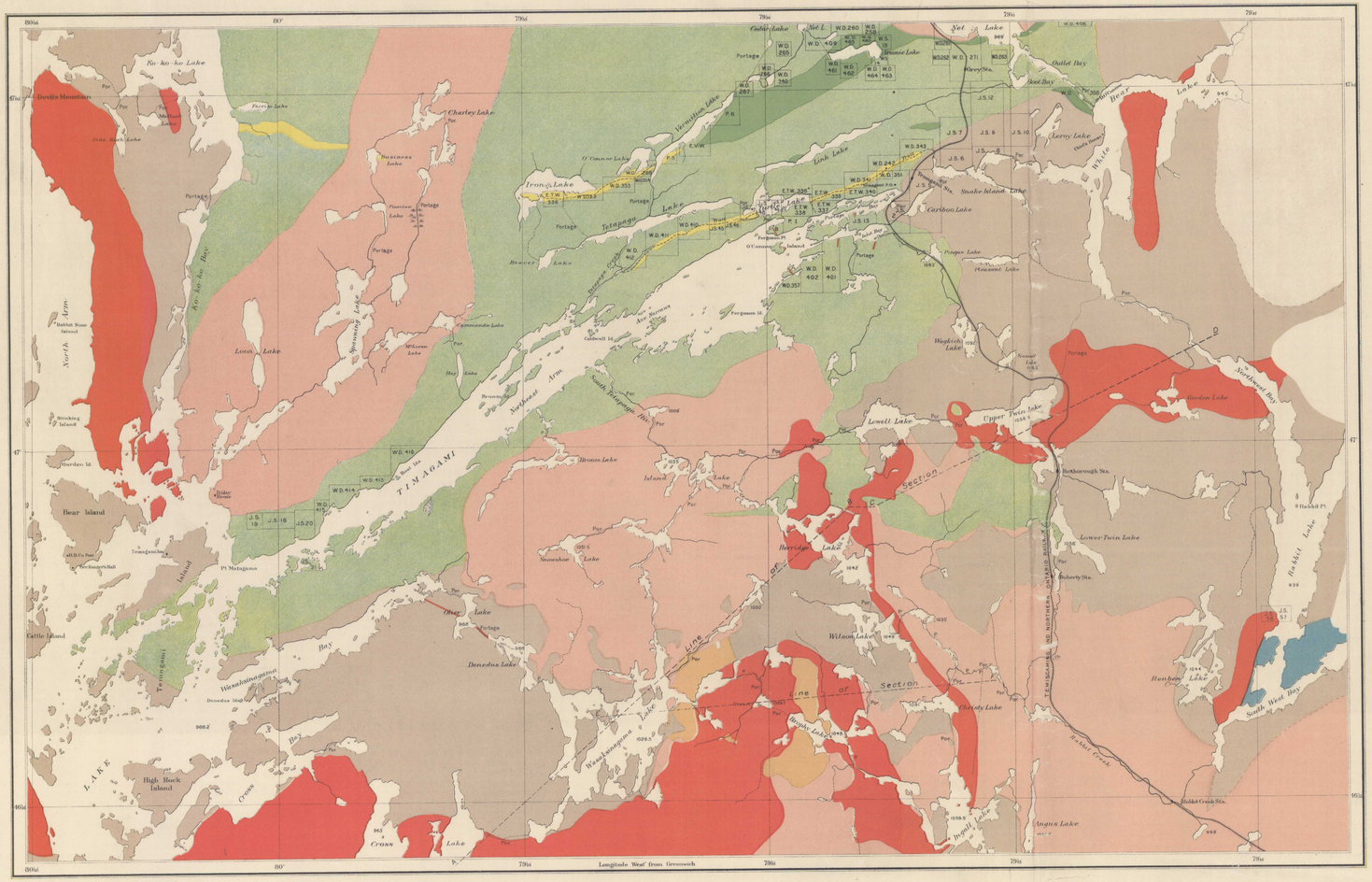
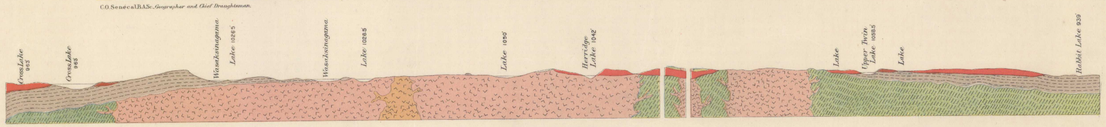
Geological Survey of Canada

A. P. LOW, B.A.Sc., DIRECTOR.

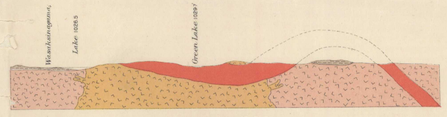
1907



C.O.Senécal, B.A.Sc., Geographer and Chief Draughtsman.



SECTION ON LINES A-B, B-C and C-D.
Horizontal Scale 1 mile to 1 inch.
Vertical Scale 1600 Ft. to 1 inch.



SECTION ON LINE E-F
Horizontal Scale 1 mile to 1 inch.
Vertical Scale 1600 Ft. to 1 inch.

Compiled by G.A.Young and J.O'Farrell from surveys by A.E.Barlow 1887-88, 1892-94, 1903-1905, O.E.Leroy, 1903, G.A.Young, 1904 and from Plans of the Crown Lands Department of Ontario.
Geology by A.E.Barlow, O.E.Leroy and G.A.Young.

GEOLOGICAL MAP
of the area between
TIMAGAMI AND RABBIT LAKES,
District of Nipissing, Ontario,
by
A. E. BARLOW AND G. A. YOUNG.

Scale: 1 Mile to 1 Inch = 63360

99 60 40 20 0 1 2 3 Miles.

Preliminary Edition. No. 944.
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DESCRIPTIVE NOTES.

UPPER HURONIAN.

QUARTZITE.

This topmost member of the Huronian occupies a comparatively small area in the northeast corner of the map, to the east of White Bear lake. The quartzite is usually coarse in grain, often approaching the character of a grit or fine conglomerate. The rock is made up chiefly of fragments of quartz with some of feldspar, cemented by a siliceous matrix, also somewhat closely compacted together, with a very little interstitial finer feldspathic material. In the area adjacent to White Bear lake the rock has a prevailing greyish colour but usually it has a pale greenish tint. It is regarded as the geological equivalent of the Lorraine arkose of the Cobalt mining district.

LOWER HURONIAN.

SLATE AND CONGLOMERATE.

The conglomerate which forms the base of the Huronian of this district is the rock previously referred to by Logan and Murray in their first geological descriptions as "slate conglomerate" or "chloritic slate conglomerate." Both as a matter of rock and in its more imperfect forms of slate structure it exhibits the character of a conglomerate, carrying fragments chiefly of various eruptive rocks which vary in size from the smallest pebble to boulders which are sometimes several feet in diameter. The largest and most abundant pebbles are of flesh-red felsite and hornblende-granulites, and fine-grained red quartzite, but pebbles of diabase, diorite, porphyrite, and green schists are also abundant. Rarely pebbles of jaspilite are found, especially in the vicinity of the iron formation. The finer-grained matrix, usually dark green in colour, is made up chiefly of chlorite with some sericite in which are embedded small fragments of quartz, orthoclase, plagioclase and occasionally microcline. Wherever any considerable section is exposed, the conglomerate passes upward into a slate by a gradual decrease in the number and size of the pebbles. Over large areas, however, the upper beds cannot be said to be true slates, since pebbles are of very common occurrence. Some of the slates are very evenly bedded, the lines of sedimendation being marked by a very conspicuous and beautiful colour banding, in shades of light and dark green, reddish brown and even purple. Some of the higher beds are very evenly laminated, splitting into thin layers parallel to the bedding, but the tendency is to a massive condition rather than to a fissile structure, and the strike and dip are commonly very variable. Where the beds are sharply folded but more generally they form a series of low broad domes, resting unconformably on the granite or upturned edges of the Keewatin schists and quartzites. In the region under description the various members of the Huronian seem to be in perfect conformity with one another, the transition from one to the other showing a rather perfect though rapid gradation. In the Cobalt mining district, situated about 30 miles to the north of the edge of the map, the veins containing the cobalt, nickel silver, arsenic ores occur in rocks of the same composition and geological age as those classified and outlined as Lower Huronian on the accompanying map. It was with this fact in view that the detailed geological mapping of this area was undertaken and it is hoped that it may prove to be of material assistance in the hand searchers for a deep seated, yellow, this rendering it very conspicuous.

A pale flesh-coloured much fractured quartzite underlies the Lower Huronian conglomerate on the Southwest bay of Rabbit lake. It is evidently the source of the fine-grained felsitic pebbles so often noticed in the conglomerate.

All of these rocks have a prevailing dip in a northwesterly direction, at an angle of seldom less than 50 degrees and usually varying from 65 degrees to vertical.

ORES OF THE KEEWATIN.

The Keewatin formation which is extensively developed in the area covered by the present map contains, besides the iron already mentioned, certain characteristic minerals of economic importance. A mineralized zone or belt extends from Net lake to Vermilion lake. The most prominent mineral noticed is arsenopyrite (mispickel) a compound made up of arsenic, iron and sulphur which is also gold-bearing. This is usually associated with more or less chalcopyrite, galena and pyrrhotite. At the Big Dan mine near Grey station on the T. & N. O. Ry. a concentrator has already been erected for the treatment of these ores while at the Little Dan, Major R. c. Lockie is developing a very promising deposit of mispickel. Assays of this ore by Mr. M. F. Connor resulted as follows:

	I.	II.	III.
Gold	0.44	0.07	0.30 oz. per ton.
Arsenic	34.00	——	—— per cent.
Insoluble	12.40	——	—— per cent.

Native gold has been found in quartz veins associated with the Keewatin rocks on Emerald lake to the west of Temagami and it is possible that economically valuable deposits may be found within the area of the accompanying map.

OLIVINE-DIABASE.

Cutting these rocks at various angles are dikes of olivine-diabase. The oldest of these dikes cut the sericite schists but have been subjected to similar deformation and decomposition. The examination, therefore, of the thin sections gives very little information regarding their original structure and mineralogical composition. A second set cut across the foliation of the sericite schists, but have not been subjected to the severe stresses which have metamorphosed the enclosing rocks. They show, however, considerable decomposition, and have not been noticed cutting the overlying conglomerate. Still a third set of precisely similar mineralogical composition cuts even the overlying slate-conglomerate. This olivine diabase is very fresh and typical.

DIABASE.

In addition to dikes of olivine diabase, large areas are covered by a similar rock mostly free from olivine and it seems reasonable to suppose that they are portions of a once continuous sill or lacolith. The rock is very uniform in composition, made up essentially of labradorite and augite with biotite, ilmenite and often a little quartz filling up interspaces. It is very rarely fresh, however, and the augite is often replaced either wholly, or in part by hornblende and chlorite. The rock is often very coarse grained becoming finer as the contact is approached and also sometimes at intermediate junction. It is frequently porphyritic, the plagioclase and the contact follows the folds of the plastic formation. At one locality a sheet-like area of diabase passes gradually into a dike-like mass dipping under the granite.

SYENITE.

A pink hornblende syenite occurs on the shores of Wasakisnogama and the shores of Brophy lakes and is undoubtedly younger than the prevailing grey granite.

GRANITE.

The Friday granite, as it has been called, which extends in a northeast direction from Spawaling and Young Loon bay of Timagami lake to Charlie lake and beyond, is, in general, a coarse flesh red often porphyritic granite, usually poor in ferromagnesian minerals. It is usually a biotite granite.

Two varieties of granite which are found in the area of the map north of the Northeast Arm, may be classed as a grey and a pink type. The carbonate have been found in the area immediately west of Iron lake seems to throw some light on the question of the origin of these occurrences. A specimen of this, examined by Mr. Donald Locke, assayer to this department, showed iron 35.07, silica 34.95, sulphur 0.01, phosphorus 0.022, with no titanium. The information already obtained seems to show rather clearly that, in the main, at least, the conclusions reached in regard to the origin of the iron formation and iron ores of Michigan and Minnesota will apply to the occurrences in the vicinity of Lake Timagami.

In the fall of 1906 the discovery of what appears to be a considerable body of high grade iron ore was made on the north side of the Northeast Arm iron range. The first specimen sent to the Geological Survey Department was assayed by Mr. M. F. Connor with the results as shown under I. An assay of another sample submitted later gave the same analyst the results under II.

	I.	II.
Iron	58.12	60.90
Phosphorus	0.0021	0.11
Sulphur	0.009	——
Insoluble	10.2	7.50

This iron ore made up chiefly of magnetite, but containing a certain proportion of hematite, may be analogous to the large secondary deposits which constitute the mines of the Minnesota iron ranges.

GREENSTONE AND GREEN SCHISTS.

The schistose rocks of the Keewatin may be divided into the paler coloured and more acid varieties, which are deformed quartz porphyries or porphyrites, and the more deeply coloured or basic schists resulting from the shearing of hornblende porphyrites, basalts and diabases. The extreme deformation of the more acid types produces sericite schists, which reveal little or no trace of their original structure. In places, however, in hand specimens secured showed clearly that they have resulted from the shearing and alteration of quartz-porphyries or quartz-porphyrites. In colour they are generally pale yellowish green, although occasionally mottled with purplish, reddish or pink tints. In the less altered varieties the feldspar crystals are macroscopically apparent, usually feldspar in yellowish, reddish, or more rarely green colours. The least altered variety of these porphyries shows the usual more or less rounded phenocrysts of quartz, together with orthoclase and oligoclase, embedded in a groundmass which varies considerable in texture from being finely crypto-crystalline to moderately coarse-grained micro-granitic. The quartz phenocrysts exhibit characteristic invasions and inclusions of the ground mass. By progressive steps this structure is gradually effaced until in the extreme schistose varieties nothing remains but a comparatively coarsely granular mosaic of quartz, sericite and calcite. Some of the more massive types have undergone considerable decomposition, and the original phenocrysts of feldspar can with difficulty be separated from the equally weathered groundmass. These more acid types pass into porphyrites which contain little or no quartz, and finally into dense, compact, fine-grained rocks which probably represent the original occurrences of hornblende. Iron ore, always limonite, either partially or completely altered to leucoxene, is also present in considerable quantities, while calcite or dolomite is always abundant. Such rocks are of a deeper green colour and are the immediate associates of the iron formation, forming steeply pitching troughs in which the iron formation is enclosed.

Some of the deformed greenstones have evidently been formed at or near the surface, for patches of the thin sections still show the micro-granitic groundmass characteristic of a porphyrite, passing into areas where the ophitic or diabasic structure prevails. The resulting rocks are a hornblende porphyrite and uralitic diabase. Some of the associated green schists are deformed basalts. All of these have suffered greatly as a result of shearing and decomposition so that the component minerals in most cases show the extreme of alteration.

Associated with the sericite schists, and interbanded with them, are some greenish grey, or greyish, slaty rocks occurring mainly on Beaver and Tetapaga lake. They show the development of mica on the cleavage planes, with bands of varying colour. In places, also, some dark grey bituminous or graphitic shales occur. These were noticed along the northern border of the iron range of the Northeast Arm, especially near the eastern end.

A band of dolomite, fairly continuous, extends from Ferguson mine point to nearly the end of the Northeast Arm. It is generally of a pale greenish grey colour and very siliceous. The quartzose impurities are arranged in narrow, vein-like forms, which reticulate in all directions through the mass, so that when subjected to ordinary weathering processes these stand out in relief, leaving the dolomite between them in hand weathers to a deep orange yellow, this rendering it very conspicuous.

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Two varieties of granite which are found in the area of the map north of the Northeast Arm, may be classed as a grey and a pink type. The grey type is by far the more abundant and occurs in two main areas; one of these lies on both sides of the northern extention of Wa-sak-si-na-gama, and reaches far her north across the South Pashagas river; the other is found about Ingall lake, extends north to Herridge lake, eastward to Rabbit lake, and southward to the southern limits of the map. This granite is commonly of a greyish, colour, coarse-grained, and, as a rule, is rather rich in coloured basilicates. The feldspars are usually conspicuously large and tabular, and when hornblende is the chief coloured constituent, the latter mineral is often present in large prismatic individuals. Frequently, however, biotite is the principal coloured basilicate; at other times it may be present with hornblende in about equal porportions. In the eastern area, the minerals mentioned are sometimes seen to be rudely parallel, and proceeding southward, towards the borders of the district, this parallelism apparently becomes more prominent. Still a third set of precisely similar mineralogical composition cuts even the overlying slate-conglomerate. This olivine diabase is very fresh and typical.

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