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REPORT ON O.E.X. GEOLOGIC SURVEY.
Sheldon Area.

BRIEF DESCRIPTIVE NOTES FOR THE
LITHOLOGY AND STRUCTURE.
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Contents	Page.
Abstract.	7.
Pelly-Bell area.	5.
East of Ptarmigan Fault, Tim-Don area. and North of Pelly Lake area.	11.
West of Spud Claims area.	14.
Table	Table showing the Units of Succession and the Locations of Rock Samples taken.

Abstract

1. Pelly-Bill area.

- ① The area mainly divided into two blocks. The one is characterized by green-maroon - yellow shales, limestone and gritty quartz pebble quartzite --- Proterozoic, and the other is coal black chert, phyllite, silty dolomite and varicoloured quartzite ---- Devonian to Upper Mississippian.

These two blocks is separated by Northwesterly striking fault named as Conglo Fault.

- ② To the west of Conglo Fault, Proterozoic succession forms tight northwesterly striking anticline, whose axis strikes in oldest gritty massive quartz pebble ~~conglomerate~~ quartzite.
- ③ To the east of Conglo Fault, the Palaeozoic succession divided into three blocks. characterized by.
1. conglomerate.
 2. quartzite
 3. main block. (coal black chert, phyllite and dolomite)

These blocks are separated by fault with each other.

- ④ Conglomerate is youngest and probably upper Devonian or lower Mississippian. Quartzite is oldest and probably lower Devonian to middle Devonian. And main block is probably middle Devonian which is characterized by dolomitic sequence.
- ⑤ Buff weathering silty dolomite, which seems to be most favorable host rock in the area, belongs in said main block and is bedded between coal black chert and some coloured phyllite.

2. East of Ptarmigan Creek Fault, Tim-Don area and North of Pelly Lake area.

- ① The area is characterized by quartzite, limy succession and phyllite minor chert. These rocks are probably Proterozoic in age. The quartzite is probably oldest among all.
- ② The rocks north of Pelly Lake, ^{mainly} ~~which~~ ^{are} cherty limestones, resemble the rocks south of Klar group.
- ③ The ~~and~~ ^{main} ~~mary~~ of Geo-chemi. and E.M. lies on the contact zone between quartzite and limestone. The deposits in skarn visible on the surface are too small to any ^{carry on} scale of mining operation. However, it is safe to say that contact is most favorable condition in this area from the observation in the field and probably warrants further prospecting.

3. West of Spud claims area.

① The area is underlain by

1. Cambrian - - - - spotted hornfels,
light grey phyllite.
2. Middle Devonian - - - - Buff weathering
silty dolomite, and
3. Middle Devonian or younger
grey calcareous
phyllite.

② Dolomite sequence may be correlative to those of Dolomite Ridge (Middle Devonian) and Bell area, but is more limy than other two sequences.

Pelly-Bill area

The meta-sedimentary succession of the mountainous area south of Pelly Lake, here termed Pelly-Bill area, is mainly divided into two classes.

The one is characterized by extremely coal black chert, same coloured phyllite, quartzite and buff weathering grey silty dolomite, which appears to be the most favorable host rock in the area, and the other green, maroon and greenish yellow shales, commonly with phyllitic foliation and being calcareous, light grey fine grained limestone and gritty medium grained quartzite, locally with quartz-pebbles and being conglomeratic.

It appears that North-westerly striking fault along the valley being a tributary of Pelly-Woodside River, referred hereinafter as Conglo Fault, separates the area into two blocks and brings the former to the east against the latter to the west.

Geology of the western block consists of gritty massive quartz pebble quartzite, light grey medium grained quartzite, green, maroon and greenish yellow calcareous shales with phyllitic foliation, light grey fine.

grained massive limestone, interbedded shelly, cherty and phyllitic limestone and grey phyllite. In the mapped area of Air photo A12343-4 and A12189-359, the section of these whole rocks outcrops and is divided into following six units,

From the east,

1. Massive, shelly and cherty limestones, in which light grey fine grained limestone is thick, and minor interbedded phyllite.

(Unit 2-2-4)

2. Medium grained gritty quartzite, commonly flecked with rust and locally micaceous, (muscovite, ankerite and minor biotite)

(Unit 2-1-3)

3.

3. Green, maroon, greenish yellow and grey calcareous shales, with phyllitic foliation and locally laminated, and interbedded light grey fine grained massive limestone.

(Unit 2-2-2)

4. Brownish white gritty massive quartz-pebble quartzite, commonly with rusty fleckles,

and medium grained gritty quartzite.
(Unit 1-1-1)

5. Unit 2-2-2.

6. Unit 1-1-3.

General attitude was noted striking $100^{\circ} \sim 130^{\circ}$ dipping $60^{\circ} \sim 75^{\circ}$ east in the area eastward from unit 1-1-1, against $60^{\circ} \sim 70^{\circ}$ west dipping in the western half of succession, although top of quartzite bed, lying in the middle of this symmetric arrangement, is unknown.

Unit 1-1-1 and unit 1-1-2 resemble unit 1d and 1c of G.S.C. Sheldon Lake sheet, for which is referred below. respectively

The lower part of unit 1 (1d) consists mainly of thick-bedded, gritty, quartz-pebble quartzite and interbedded dark shale and slate. In places the quartzite is somewhat micaceous and commonly flecked with rusty ankerite. The fine-grained matrix of some of the quartzite beds is partly limy. Where exceptionally coarse-grained and massive, the outcrops of quartzite and the huge, angular, talus blocks derived from it, resemble granite from a distance. The sequence of green, maroon, and dark shales (1c), which mark a conspicuous and consistent horizon in the region, appear to overlie the quartzites (1d) on the ridge northwest of Wolf Canyon on Pelly River. Intense crumpling in many of the individual outcrops, and numerous repetitions of the green and maroon shales both north and south of Dragon Lake, indicate complex structure in the Proterozoic rocks. Between Pelly and Woodside Rivers, near the eastern edge of the map-area, the green and maroon shales appear to be overlain by phyllite and an interbedded sequence of thin-bedded limy shale and silty limestone. These have been included in unit 1c although they resemble parts of the Cambrian strata in Nahanni map-area.

Unit 1-1-1 is very close to unit 1-1-3, but more conglomeratic than unit 1-1-3 and consists mostly of quartz pebble quartzites.

There are no definite evidence to decide whether this systematic arrangement of succession derives from cycle of sedimentation or anticlinal structure.

However, from the several reasons said above, it is writer's considered opinion that

- 1) unit 1-1-1 and unit 1-1-2 are similar to unit 1d and unit 1c of G.S.C. map respectively, so that unit 1-1-1 is oldest,
- 2) ^{the} succession is Proterozoic in age and
- 3) Therefore, the succession forms tight northwesterly striking anticlinal structure.

In the mapped area of Air photo A12189-359, minor dropside skarn zone was recognized, with the mineralization of pyrrhotite, chalcopyrite and scheelite. However, deposits ^{are} commonly only some 3 feet by 50 feet, and distribution is also sporadic.
in size.

To the east of Conglo Fault, dark grey chert pebble conglomerate and minor interbedded dark sandstone, phyllite and black chert (Unit 2-3-6), which seems to be upper part of Pelly-Bell succession, forms conspicuous outcrops in Air photo 12189-328 mapped area, and appear also to be in fault contact westward with older grey and buff medium grained quartzite (Unit 2-3-2) and thinning out to the southeast.

Another conspicuous outcrops of quartzite are recognized in the two ridges running parallel with each other from north to south in Air photo A1 3518-283 and occupy almost whole area of these two ridges. (Unit 2-3-1). This unit is probably older than unit 2-3-2, and separated from main blocks of Pelly-Bell area (Unit 2-3-2 to 2-3-6) by the fault running through in the granodiorite. ~~and~~ Medium grained buff, light grey to light purple grey quartzites are common but white, black and greenish grey quartzites were also noted. Quartzites have interbedded light grey silicious limestone and minor chert and spotted phyllite.

The sequence of coal black chert, coal black phyllite and buff weathering ~~grey~~ light grey silty dolomite, which appear^{as} to overlie unit 2-3-2, outcrops in the ridge near Bill claims (Air photo 12189-357); and in the southern part of the said quartzite's ridge. (Air photo 12189-359)

It appears that this silty dolomite bed is the most favorable host rock in the area. ~~and~~

Therefore the effort ~~is~~ has been directed to locate the place of the dolomite on the map in mapped area of Air photo 12189-357 and 12189-359.

Unit 2-3-3 appear to be overlain by unit 2-3-4. ~~unit~~ consisting of coal black chert, phyllite, minor coal black slate, light grey chert. The rocks are extremely hornfelsic and flecked with stained pyrite and pyrrhotite on the northern slope of Pelly-Bill ridge.

East of Ptarmigan Creek Fault, Tim-Don area, and North of Pelly Lake area.

The Don claims area is underlain by north westerly striking light grey to whitish quartzite (unit 1-2-1), light grey limestone (unit 1-2-2), phyllite (unit 1-2-4) and chert (unit 1-2-5), with striking $100 \sim 130$ dipping steeply ($60^\circ \sim 70^\circ$) to the northeast.

Unit 1-2-1 consists of light grey to whitish medium grained quartzite, locally with rusty flecks and quartz pebbles, ~~outcrop~~ and outcrops in the center zone of Don ridge striking 100° to 130° .

Unit 1-2-1 is apparently overlain by ^{thin-bedded} light grey quartz pebble limestone (50 feet on the boundary), which changes gradually to fine grained massive limestone, at the cliff southeast of Don claims.

To the east of limestone, thick-bedded black and dark grey phyllites outcrop on the ridge, and appear to overlie the limestones.

To the west of unit 1-2-1, outcrops of thin-bedded (100 feet) light grey massive limestone, dark grey to black phyllite, varicoloured chert ~~miner~~ and minor spotted phyllite were observed.

Phyllite is similar to that of eastern side of central quartzite zone.

Therefore it appears that the area lies within the northwesterly tight anticlinal ^{zone} striking 100 to 130 overturning $70^{\circ} \sim 80^{\circ}$ to the northeast.

It was noted that, in places, diopside skarn near the contact between limestone and quartzite has galena, sphalerite, pyrrhotite and chalcopyrite. However, the mineralization is commonly up to 10 feet thick and also sporadic distribution, so far as being recognized on the surface.

Unit 1-2-3, characterized by light grey to buff laminated shelly limestone with minor interbedded sandy, cherty and massive limestone, outcrops in the area south of Nar claim.

The geology of north side of Pelly Lake consists of unit 2-2-1:-- light grey to white weathering grey fine grained cherty limestone, ~~the~~ minor laminated shelly limestone.

unit 2-2-2:-- white to purple white calcareous chert, minor blade chert, whitish quartzite and interbedded massive limestone.

The succession generally strikes $110^{\circ} \sim 135^{\circ}$ dips steeply ($70^{\circ} \sim 90^{\circ}$) to ~~the~~ north.

Unit 2-2-1 resembles unit 1-2-3 of north Nar area, but unit 2-2-1 is more cherty against shelly unit 1-2-3.

West of Spud claims area.

Tan to brown weathering light grey fine grained hornfels with grey spots (unit 2-1-1) forms conspicuous and consistent outcrops in the area along the zone outside of north-westerly striking granodiorite batholith.

This rock appear to be Cambrian.

Unit 2-1-1 is overlined by unit 2-1-2 consisting of buff to brown weathering light grey phyllite.
(Cambrian)

The quartzite and phyllite contain numerous small quartz veins, but quartz veins are barren.

The sequence of unit 2-1-3, characterized by the light tan weathering phyllitic foliated silty dolomite, light tan weathering blue white laminated cherty dolomite and whitish green laminated and somewhat banded cherty limestone with numerous small lenses of light grey fine grained massive limestone, overlies unit 2-1-2 at the west of spud claims. This dolomite sequence appear to be similar ~~to~~ with thick-bedded ~~to~~ middle Devonian dolomite beds in the Poromite Ridge area.

To the east of unit 2-1-3, unit 2-1-4, consisting of coal black chert and phyllite, minor fine grained white and partly black crystalline limestone and calcareous phyllite, and unit 2-1-5 of black calcareous phyllite overlies unit 2-1-3.

Unit 2-1-3 and 2-1-4 resemble unit 2-3-3 and unit 2-3-4 in the Bill-Pelly area, but unit 2-1-3 is ^{more} ~~rather~~ calcareous against strictly devonetic unit 2-3-3.

Biotite Granodiorite forms batholiths and stocks ~~at~~ several places in whole mapped area.

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