020375

STREAM SILT SAMPLING

Ross River — Vangorda Creek

Pelly River — Mye Mtn. Gossan Area

105-J, 105-K - 6

Yukon Territory

February, 1963. — Angus MacDonald

GEOCHEMICAL SURVEY

Of

ROSS RIVER

105 J, K.

Yukon Territory

The first half of August, 1962, was spent in silt sampling tributaries to the Ross River. A river boat, powered by 18 h.p. outboard motor, was used. Jnr. Jack Ladue, a Ross River native, was hired as guide and boatman. The river was sampled up-stream from its junction with the Pelly to a point 6 miles south of Otter Creek. Here, the river was wide, rocky and shallow (one foot deep or less) and the project was discontinued.

METHOD:

It soon became apparent that the broad, flat Ross Valley would cause difficulty in sampling the streams. Most of the streams entered the Ross after seepage through miles of swamps or passage over miles of Ross Valley silt. This would result in a severe and extremely variable dilution of metal content in the silt sampled.

The sample was taken as far up-stream from the Ross as time and terrain would permit. Where the stream outlet was in low, swampy ground, however, the silt could only be taken below the high water level of the Ross.

Where the stream itself exhibited a distinct flood condition, samples were taken both from the stream bed and from the flood silt above the present water level. This was an attempt to find out if there was a variation in metal content between low and high water silt deposits.

Plastic spoons were used to gather the material which was placed in labelled plastic bags. The location of the sample was noted on a 4 mile topographic map along with brief, marginal notes about the size of the stream and type of material sampled.

A large sample, two heaping tablespoons, was taken so that there would be enough material for several tests. Back at the base camp at Ross River, part of the sample was tested by the ammonium citrate-dithizone method. The/

Method (Cont'd):

The remainder was split, half being sent to X-Ray Laboratories in Toronto and the rest retained for further tests, and as insurance against loss of the samples in transit to Toronto.

RESULTS:

Field testing indicated that most of the streams had a detectable heavy-metal content. These results will not be used; any figures listed below as p.p.m. are results of testing by X-Ray Laboratories.

Ross River silt, taken in two widely separated locations, R-1-Cam and R-30-B gave "background" values of Cu - under 10 p.p.m., and Zn - 70 p.p.m. All of the side-streams gave values higher in Zn than these, the average being 194 p.p.m. - Zn.

One sample, R-LST, had Zn in excess of 400 p.p.m. This small stream, about 2' wide, entered the Ross through pyritic slate. Five samples, R-5A, R-18-M1-SS, R-24A, R-31B, R-31A, contained 300 or more p.p.m. Zn.

CONCLUSIONS:

All of the streams show high concentrations of Zn. Because of innumerable variations, i.e. type of silt, size of particles, organic content, distance of travel - some streams were 20 miles long or more - dilution by Ross flood silt etc., it is possible that a stream carrying 100 p.p.m. might run over an ore deposit while one giving 400 p.p.m. might have nothing but a bit of float near the place from which the sample was taken.

The only fully reliable method is to sample each stream at, say, ¼ - ½ mile intervals to it's head. Since this is time consuming, the localities would have to be carefully selected because of geology, structure or favourable history.

None of the results are sufficiently high to warrant a large expenditure in further work.

Some areas, however, will be easily accessible when the Canol road is extended beyond Ross River and should have further work done on them.

Cu values do not appear to have any diagnostic value in these samples. R-29 - 50 p.p.m. Cu - is from swampy material. No silt was available and the sample was largely black mud.

RECOMMENDATIONS:

Follow-up work should be done on the following streams, which are listed in order of accessibility:

(1) R-31A - 310 p.p.m. Zn R-18-M1-SS - 330 p.p.m. Zn
R-31B - 330 p.p.m. Zn R-18-M1 - 250 p.p.m. Zn
R-32 - 270 p.p.m. Zn

These streams (31+32) were sampled on the way up the Ross where a lunch stop was made, (2L). Ladue knew this area as 18 Mile Creek, hence R-18-M1-SS - stream silt above Ross flood level, and R-18-M1 - silt below Ross flood level. The samples check very well.

At their outlet, these streams are only a few hundred feet apart and drain a relatively small area - easily accessible via the Canol Road. Here granodiorite and porphyry intrude upper Ordovician sediments.

(2) R-16A - 280 p.p.m. Zn:

Significant because Jack Ladue mentioned, at the time of sampling, that "This could be the rusty stream seen on the Canol Road". This stream should be sampled both above and below the Canol Road.

The stream drains a region of porphyry intrusives and, therefore, may indicate an attractive prospecting area.

(3) R-5A - 300 p.p.m. Zn
R-5B - 270 p.p.m. Zn:

On the Canol Road side of the Ross River and will sooner or later be more accessible when the Canol Road is re-opened.

(4) R-L5T - 430 p.p.m. Zn:

Access difficult. The stream comes from a small lake. There is probably no outcrop. No special effort should be made to follow it up. However, it should be remembered and sampled further if work is done in the vicinity; or it should be sampled if a 'plane can land on the Ross at this point, perhaps on its way to or from the MacMillan Pass area.

(5) R-24A - 300 p.p.m. Zn
R-24B - 260 p.p.m. Zn
R-24C - 170 p.p.m. Zn:

Although higher than average in metal content, this would involve several/

Recommendations (Cont'd):

(5)......

several miles of sampling. The Sheldon Lake and Finlayson Lake geological map sheets indicate that outcrop is almost non-existent.

Angus MacDonald.

GEOCHEMICAL SURVEY

Of

PELLY RIVER

Ross River to Vangorda Creek, 1962.

105 K

Yukon Territory

Sampling the streams coming into the Pelly River was more difficult than those along the Ross River. This was due to the many log jams, bars and islands which often blocked direct approach to the stream mouths, making walks of up to two miles necessary.

As with the Ross, the broad Pelly Valley, wherein the average distance to rock exposure would be in the order of four miles, is not everywhere suitable for sediment sampling.

RESULTS:

Results are inconclusive.

Average values for the tributary samples, other than Vangorda Creek, were 7 p.p.m. Cu, 118 p.p.m. Zn; for Vangorda, 13 p.p.m. Cu, 170 p.p.m. Zn. Thus, the sediment at the mouth of Vangorda Creek is distinctly higher than average, but lower than a few of the other streams.

It is interesting to note that a panned sample, reduced approximately 100:1, consisting of the heavy mineral fraction, contained the lowest metal content of the Vangorda Creek mouth area - under 10 p.p.m. Cu, 100 p.p.m. Zn.

Sample P-10 - 40 p.p.m. Cu, 230 p.p.m. Zn - has the highest metal content of any sample other than Vangorda Creek. It should not be interpreted as an anomaly since the sample was not silt from a running stream, but fine clay-silt in a stagnant basin. No running water could be found in this locality.

CONCLUSIONS:

None of the results warrant special follow-up work. The stream draining Orchay Lakes is slightly higher in Zn than average. A favourable contact/

<u>Conclusions</u> (Cont'd):

contact crosses (?) the stream about 4 miles from the Pelly. The Vangorda - Ross River trail should cross the Creek at a good location for sampling. If, for any reason, someone associated with the Company is in a position to sample this stream, it should be done.

Grew Creek and Buttle Creek give indications of Zn. The new Ross River - Carmacks road should cross the headwaters of these, as well as many other streams, and all should be sampled.

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GEOCHEMICAL SURVEY OF VANGORDA CR.

Yukon Territory

105 K

Mr. Kulan and the author made a traverse down Vangorda Creek from the "mine" to the Pelly River. An attempt was made to sample it at regular half-mile intervals, but the 4-mile map provided poor topographic control. As a result of inability to pinpoint the location of many of the samples the results are not too useful. The following statements can be made:

1. None of the tributaries entering Vangorda Creek showed significant quantities of Zn.

2. The limonite over the Vangorda deposit is devoid of indicative values of Cu or Zn.

3. Three-quarters of a mile below the deposit the values are still sufficiently high 330 p.p.m. to indicate mineralization higher up.

4. Two miles below the main deposit VC-6 and VC-7 the values are suddenly higher. There are several possibilities for this:

   (a) Another Zn deposit, as yet undiscovered lies in the vicinity

   (b) This area near the confluence of the two branches of Vangorda Creek has a greater amount of mineralized float than is usual along the rest of the stream

   (c) The samples VC-6 and VC-7 were somehow contaminated after collection

   (d) A fault carries mineralized water directly from the Vangorda deposit to this vicinity

Because of the possibility of (b), (c), (d), etc., it is doubtful if a special foot trip should be made to this location for follow-up work. If a helicopter is available, an attempt should be made to land at the junction of Vangorda Creek with the stream draining Shrimp Lake. Samples should be taken every 200 or 300 feet up Vangorda Creek for about three-quarters of a mile, or, if time is not available, at least 2 or 3 spot samples taken to check the anomalous values.

5. The silt at the mouth of Vangorda Creek contains more Zn than the average stream entering the Pelly River. (See Pelly River - Geochem.) The values at the mouth, however, do not clearly indicate the presence of the Vangorda deposit.

February 13, 1963 Angus MacDonald

AM:smg

GEOLOGICAL SURVEY OF CANADA
DEPARTMENT OF MINES AND TECHNICAL SURVEYS

PRELIMINARY SERIES

SHEET 105 J

3 Rust Seep.

LEGEND

Map-units A, 2, 6, 7, 8, 9, 10, and 12 appear on Map 13-1961, "Tay River" only

CENOZOIC

QUATERNARY

15 15a, modern unconsolidated alluvial deposits; 15b, unconsolidated glacial and alluvial deposits

TERTIARY

14 Grey and dark grey andesite, dacite, and basalt, commonly massive and porphyritic; minor pyroclastic material

13 Granodioritic quartz and feldspar porphyry, probably plutonic equivalent of 14

PALEOCENE

12 Brown-weathering, brown, impure sandstone with plant remains, grey and brown conglomerate, and brown shale; 12a, rusty weathering conglomerate; minor sandstone and shale, may be equivalent to 12 but age not established, locally interbedded with part of 14

MESOZOIC

CRETACEOUS (?)

11 Medium-to coarse-grained quartz monzonite and granodiorite, commonly porphyritic; minor diorite and gneiss

TRIASSIC

10 Interbedded, dark grey to black, friable, micaceous sandstone, and shale; minor conglomerate and concretionary shale

PALAEOZOIC

MISSISSIPPIAN (?) AND/OR LATER (?)

9 9a, greenish grey quartzite, commonly thin-bedded; micaceous and silvery graphitic schists; minor dark grey siliceous slate, silty limestone, and grey micaceous quartzite; 9b, conglomerate with pebbles of chert, andesite, quartzite, chlorite schist, and limestone

8 Altered, dark green andesite and basalt flows and tuffs, commonly schistose, rarely porphyritic; minor phyllite, dark argillite, and light grey quartzite

7 Banded quartzose granulite, green and purplish banded skarn, quartz-sericite schist, hornfels and phyllite; chlorite schist and thin altered andesite (8) common in upper part; minor crystalline limestone

MISSISSIPPIAN

6 Dark grey massive limestone

DEVONIAN AND MISSISSIPPIAN
UPPER DEVONIAN AND LOWER (?) MISSISSIPPIAN

5 5a, chert-pebble conglomerate; 5b, black and grey chert, shale, quartzite; minor conglomerate and limestone, 5c, black slate, black and brown siliceous shales, sandstone, greywacke, phyllite; minor conglomerate

SILURIAN AND DEVONIAN

4 Grey and buff-weathering, thick-bedded dolomite, buff to reddish weathering, sandy and silty, dolomite and siltstone; buff, grey, and white quartzites

ORDOVICIAN AND SILURIAN

3 Black and varicoloured cherts, black, grey, and greenish grey shales; minor chert-pebble conglomerate, quartzite, limestone, and phyllite; 3a, massive chert-pebble conglomerate

CAMBRIAN (?)
MIDDLE AND UPPER CAMBRIAN (?)

2 Buff-and grey-weathering, grey, green, and black shales, slates, and phyllites; silty limestone and siltstone

PROTEROZOIC

1 1a, light grey and whitish quartzite, banded hornfels and granulite, grey quartzite, skarn; minor chert and crystalline limestone; 1b, crystalline limestone; 1c, green and maroon shale, slate, phyllite, quartzite; minor andesite; 1d, gritty massive, quartz-pebble quartzite, medium-grained, grey quartzite, and dark slate

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A Quartz-biotite schist, micaceous quartzite, banded, altered, sedimentary and volcanic rocks, hornfels; minor gneiss and crystalline limestone

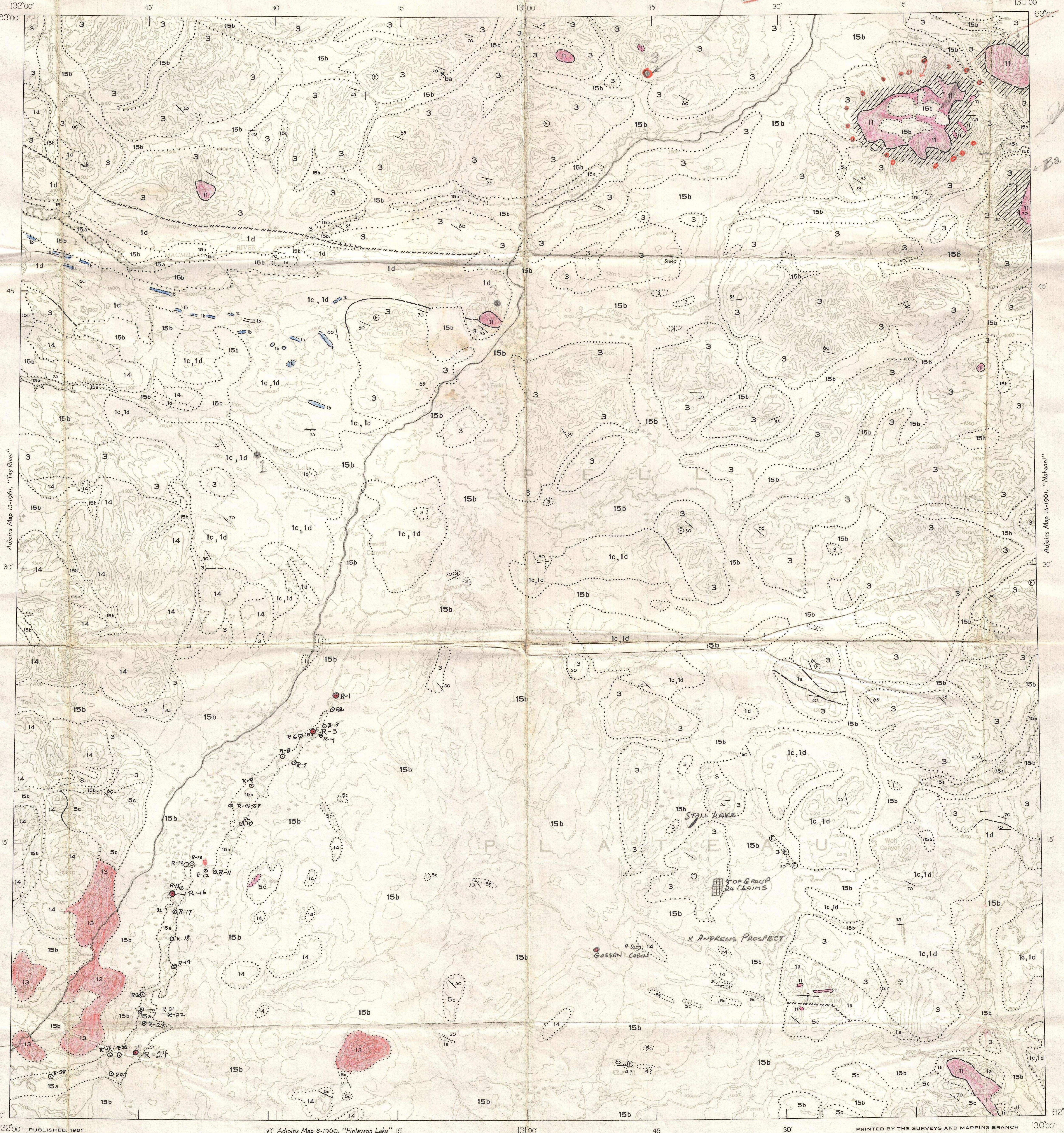
Geological boundary (defined, approximate, assumed)
Bedding (horizontal, inclined, vertical)
Foliation (inclined)
Fault (assumed)
Syncline
Fossil locality
Mineral occurrence or prospect (barite, ba) ba ×
Rock altered to hornfels

Geology by J.A. Roddick, 1958, 1960, and L.H. Green, 1960

Cartography by the Geological Survey of Canada, 1961

Air photographs covering this area may be obtained through the National Air Photographic Library, Topographical Survey, Ottawa

In response to public demand for earlier publication, Preliminary Series maps are issued in this simplified form and will be clearer to read if all or some of the map-units are hand-coloured



PUBLISHED 1961
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DESCRIPTIVE NOTES

During the summer the map-area is accessible by small boats using Pelly, Ross, and South Macmillan Rivers. Many scattered lakes, suitable for float-equipped aircraft, lie within the map-area. In summer the Canol Road is passable for motor vehicles, from the Alaska Highway to Pelly River, opposite Ross River trading post, about 15 miles southeast of the map-area. No bridge suitable for motor vehicles, or no ferry is available for crossing Pelly River. Within the map-area the Canol Road has been abandoned, and is unusable owing to numerous washouts.

During the Pleistocene, most if not all of the map-area was covered with ice, which moved west and northwest along the major valleys.

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.

From Mount Sheldon to Mount Selous (in Tay River map-area), the crystalline limestone (1b) forms conspicuous, but discontinuous, white-weathering outcrops. The limestone is grey to dark grey, and mottled with white patches, wherein the carbonate is coarsely crystalline. It is commonly massive to thick bedded, and in places contains thin bands of thinly laminated, pale greenish grey and dark grey chert.

Outcropping at several places, but best exposed on Traffic Mountain, is a sequence (1a) of light-coloured siliceous rocks consisting chiefly of light grey to whitish quartzite, grey quartzite, and light-coloured chert, together with minor hornfels, skarn, and limestone. These rocks appear to comprise the upper part of unit 1 and are commonly closely associated with, and apparently underlie, Ordovician strata.

The Proterozoic rocks are unconformably overlain by a very thick assemblage of Ordovician and Silurian rocks (3), consisting chiefly of chert and shale. Most of the cherts are grey or black, but greyish green, apple-green, white, pink and red varieties were also noted. A particularly bright, apple-green chert bed, outcropping in the northwest corner of the map-area, is believed to have contributed the rare but distinctive fragments to the Devonian conglomerate more than 100 miles to the south. Some of the black chert weathers white along the bedding planes, and produces, locally, spectacular black and white banding. Most of the shales associated with the cherts are black or dark grey, but some are greenish, and a few are red. The shales are interbedded with the cherts, but the proportions vary. The lower part of the section—probably several thousand feet of strata—is dominantly shaly; the upper part is dominantly cherty. Mixtures of the chert and shale are represented in the siliceous shales found throughout the unit. Although other sediments were noted, such as thin-bedded platy limestone, grey quartzite, and conglomerate, they are rare. In their lack of both thick beds of limestone and volcanic rocks, the cherts of Sheldon Lake map-area differ from most other thick, extensive chert deposits. Near the granitic bodies, especially in the Itsi Range, the argillaceous rocks have been silicified and altered to hornfels, forming deep, rusty-red aureoles around the stocks.

The structure in unit 3 is similar to that in the older rocks. Intense folding and crumpling is characteristic of the shales, and pervasive fracturing is common in the cherts. In places the fractures have been healed by later silicification. Unit 3 is in fault contact with the Proterozoic rocks on South Macmillan River, and apparently unconformably overlies them north of Mount Riddell. The total thickness is not known, but is thought to be about 10,000 feet. Graptolites collected from the unit (partly from outside the map-area), range in age from Lower Ordovician to Silurian.

A dark grey, sandy limestone (4?) outcrops in mostly drift covered Pelly Plateau, near the southern edge of the map-area. As it is more or less on strike with beds north of McEvoy Lake in Finlayson Lake map-area, that contain Middle Devonian fossils, it may be of Devonian age. On the other hand the Middle Devonian rocks are commonly dolomitic, so that unit 4? may not be correlative, but rather belongs to the Devono-Mississippian unit 5. Shell fragments and crinoid stems collected from unit 4? were not identifiable.

Unit 5c is exposed south of Traffic Mountain and west of the Canol Road. It consists mainly of black slaty shale and sandstone, but includes considerable quantities of chert-pebble conglomerate, chert, limestone, limy phyllite, phyllitic limestone, siliceous shale, and quartzite. It is at least 7,000 feet thick in the Pelly Lakes area. High on Traffic Mountain it is in fault contact with unit 1c. No fossils were found in unit 5c in Sheldon Lake map-area, and it is placed in the Devono-Mississippian because of its similarities to strata of that age in Tay River map-area. Some older rocks may be included.

Granitic rocks (11) form stocks in the Itsi Range and south of Pelly Lakes, and minor intrusive bodies elsewhere in the map-area. They are commonly biotite granodiorite, but vary in texture and composition. Locally, they contain large crystals of potassium feldspar and in places, significant amounts of hornblende. Xenoliths are not common. In the Itsi Range, the granodiorite exhibits a gently wavy, nearly vertical jointing. The contacts with the country rock are normally sharp, crosscutting, and dip steeply outward. Silicified rocks, hornfels, and minor pyrite are found near the contacts, but rarely beyond a few tens of feet. The granitic rocks are clearly intrusive. The University of Alberta determined the age of a granodiorite specimen (potassium-argon method on biotite) from the Itsi Range to be about 96 m.y. (Middle Cretaceous).

Quartz and feldspar porphyries (13) of granodioritic composition and commonly of plutonic appearance, outcrop in the southwest corner of the map-area, where they are closely associated with Tertiary volcanic rocks (14). These bodies possibly were feeders to, or intrusive equivalents of the volcanic sequence.

Massive, dark, andesite, dacite, and basalt flows (14) unconformably overlie deformed Palaeozoic strata west of Canol Road. The aggregate thickness exceeds 5,000 feet. Individual flows, although rarely well-defined, appear to be from 10 to 300 feet thick. Pyroclastic rocks and interbedded sediments are very rare in the assemblage. The lower part is mainly andesitic and basaltic, commonly containing feldspar phenocrysts. The upper part is characterized by dark dacites with phenocrysts of quartz and biotite. Only gentle deformation, with maximum dips of about 30°, was noted. The elevation of the unconformity at the base of the volcanic sequence varies through about 2,000 feet. This may be accounted for by faulting and deformation, but probably, the flows were extruded onto a surface of at least moderate relief.

No mineral deposits of economic significance are known in the area. Barite was noted at several places in the cherts and shales (3) north of South Macmillan River. It was found north of the small stock north of the river, in a dark grey massive bed of unknown thickness, and, above this bed, in concretionary nodules in chert. The laminae in the chert bend around the nodules, which are commonly about an inch in diameter. Barite and several rare barium silicates are known to exist in the cirque southeast of Wilson Lake on the east edge of the map-area.

MAP 12-1961
GEOLOGY
SHELDON LAKE
YUKON TERRITORY

Scale: One Inch to Four Miles = $\frac{1}{253,440}$

Miles
4 2 0 4 8 12

Note Numbers but no analysis results means that the stream, as shown on the map, did not have any particular ~~s~~ channel, the drainage being as seepage through muskeg. with no silt available

LEGEND

Road (abandoned)
Horizontal control point
Intermittent stream
Marsh
Contours (interval 500 feet)
Height in feet above mean sea-level

Base-map prepared by the Army Survey Establishment, R.C.E., Department of National Defence 1949-1951

Approximate magnetic declination, 34° 36' East

● min dep.

MAP 12-1961
SHELDON LAKE
YUKON TERRITORY
SHEET 105 J