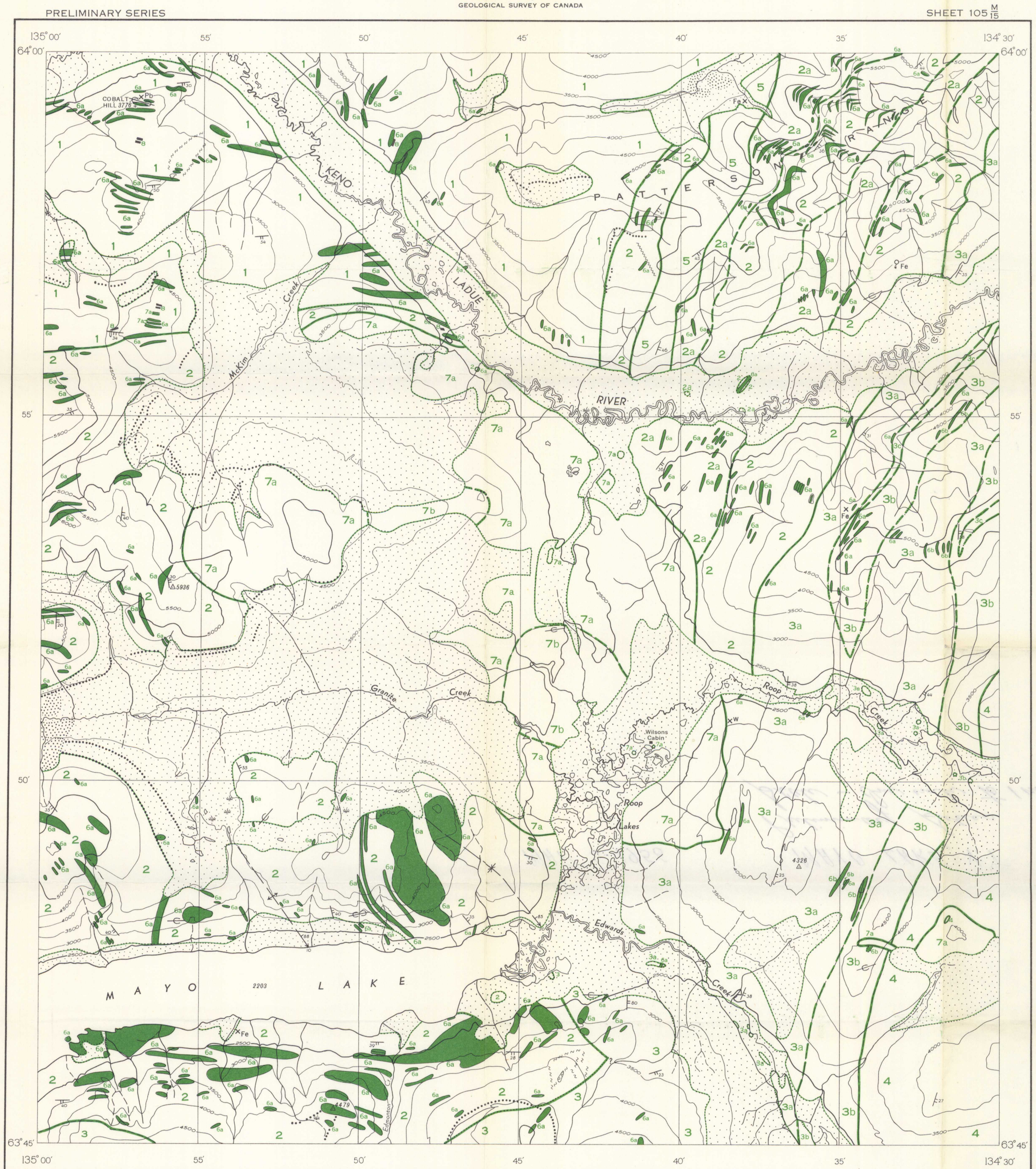
CANADA
DEPARTMENT
OF
MINES AND TECHNICAL SURVEYS

GEOLOGICAL SURVEY OF CANADA

PRELIMINARY SERIES

SHEET 105 M/15



PUBLISHED, 1957

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LEGEND

MESOZOIC

JURASSIC OR LATER

8	*Quartz porphyry*
7a, 7b	**7a**, *granodiorite;* **7b**, *porphyritic quartz monzonite*

PALÆOZOIC (?)

6a, 6b	**6a**, *greenstone;* **6b**, *serpentinized gabbro*

PRECAMBRIAN AND/OR PALÆOZOIC

YUKON GROUP (1-5)

5	*Quartz-pebble subgreywacke; may be the equivalent to 2*
4	*Phyllitic quartzite, quartz-muscovite-chlorite schist, quartzite; minor limestone*
3	*Quartz–muscovite schist, phyllitic quartzite, quartz-muscovite-chlorite schist, graphitic phyllite; minor limestone and quartzite;* **3a**, *predominantly phyllitic quartzite and quartz-mica schist;* **3b**, *graphitic phyllite and thinly bedded grey and black quartzite;* **3c**, *blocky grey quartzite similar to 2a, may be equivalent*
2	*Grey and blue–grey blocky quartzite; minor graphitic phyllite, phyllitic quartzite, and quartz-mica schist;* **2a**, *phyllitic quartzite, quartz-muscovite schist; minor graphitic phyllite and limestone*
1	*Phyllitic quartzite, quartz-muscovite schist, graphitic phyllite*

Heavily drift-covered area
Geological boundary (defined, approximate, assumed)
Bedding (direction of dip known, upper side of bed unknown)
Fault (defined, approximate, assumed)
Anticlinal axis (trace and dip of axial plane and plunge of axis indicated)
Synclinal axis (trace and dip of axial plane and plunge of axis indicated)
Glacial striæ
Terminal moraines
Kame terraces
Limonite cemented conglomerate .... × Fe
Iron-bearing spring .... ○ Fe
Mineral prospect or occurrence (lead, Pb; tungsten, W) .... × Pb

Geology by L.H. Green, 1952, 1953, and 1954

Intermittent stream
Marsh
Horizontal control point
Contours (interval 500 feet) 2500
Height in feet above mean sea-level 4663

Approximate magnetic declination, 34°31′ East

Cartography by the Geological Cartography Unit, 1956

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

DESCRIPTIVE NOTES

The centre of the map-area lies approximately 40 miles northeast of Mayo Landing. The southern part is accessible by road from Mayo Landing to the foot of Mayo Lake and thence by boat along the lake. Edwards and Roop Creeks can be ascended by canoes as far as Wilsons Cabin. The remainder of the area may be reached by pack-horses travelling above timber-line or along poorly defined game trails in the larger valleys. Several of the lakes, including that on the northern boundary of the map-area, are suitable for use by aircraft.

A plateau surface is well developed in the southern part of the area but towards the northeast mountains project above the plateau level. The higher levels of the plateau and the mountains have been sculptured by alpine glaciers and the larger valleys by glacial ice that filled them to an elevation of 4,000 feet or more and moved along them from east to west.

Much of the area is underlain by a thick assemblage of quartzites, phyllitic quartzites, schists, graphitic phyllite, and minor limestone that has been tentatively assigned to the Yukon group. The rocks of this group are divided on the basis of lithology into map-units that are believed to be arranged in order of age but repetitions of rock types within and between the map-units may be due to structural complexities.

In the vicinity of Cobalt Hill map-unit 1 is characterized by a predominance of grey phyllitic quartzites and quartz-muscovite schists. To the south, the upper part of the map-unit, underlying the massive quartzite (2), is characterized by a rusty weathering black graphitic phyllite and a thinly bedded quartzite with alternating grey and black bands.

Map-unit 2 is well exposed in the Patterson Range and along the north shore of Mayo Lake. It is the most competent of the sedimentary rocks and forms most of the higher ridges. Individual beds of massive quartzite are up to 6 feet thick but are commonly on the order of 1 foot. The quartzites contain numerous interbands of graphitic phyllite most of which are only a few inches thick. In the northeast part of the map-area unit 2a, consisting principally of phyllitic quartzite, has been differentiated from the massive quartzite map-unit.

East and northeast of Edwards Creek several lithological units have been differentiated within map-unit 3. The pronounced graphitic beds with minor limestone that form the contact with the massive quartzites (2) to the west are absent in the map-area. Unit 3a is well developed east of Wilsons Cabin where it consists of grey to greenish quartzites with beds up to 1 foot thick but commonly about 3 inches thick separated by micaceous partings and schist layers which are generally less than an inch thick. Graphitic phyllite is almost absent in this unit. Black graphitic phyllite and interbedded dark grey to black thinly bedded quartzites (3b) are well exposed on Edwards Creek near the east boundary of the map-area. The unit is complexly crumpled and appears to have been completely incompetent. Massive blue and grey quartzites (3c), exposed on the south side of the Keno Ladue valley near the border of the area, are similar to those of map-unit 2, and may be part of that unit by structural repetition.

Map-unit 4 outcrops on the eastern margin of the map-area. The quartz-muscovite-chlorite schists and white quartzite are prominent near the base of the unit and phyllitic quartzite with minor schists predominate in the remainder of the unit. The phyllitic quartzite is grey to light buff and is composed of fine-grained quartz and minor muscovite and iron-bearing carbonate. Some coarser quartz grains up to 2 mm. in size are common in many of the quartzite beds.

The quartz-pebble subgreywacke or coarse, micaceous quartzite (5), outcropping in the Patterson Range is foliated and characterized by a platy fracture. It contains coarse grains of quartz and feldspar in a matrix composed of quartz, feldspar, biotite, and chlorite. The quartz grains are up to 2 mm. in size and are commonly rutilated and pale blue although clear, pink, and black grains were observed. The unit contains minor amounts of massive grey and massive green quartzite similar to the matrix of the subgreywacke. The subgreywacke is similar to overlying strata to the east of the map-area and it may represent a facies within the quartzite (2) or an infold of these overlying strata.

Numerous sill-like bodies of greenstone (6a) have intruded map-units 1 and 2 and to a lesser extent into the overlying members. In the eastern part of the map-area more basic sills (6b) have been altered to serpentine and carbonate. The greenstones (6a) consist of hornblende and plagioclase that have been altered to secondary amphiboles, and albite and epidote respectively. The larger bodies show much of their original texture whereas the thinner bodies have developed a foliation in the secondary minerals parallel to the foliation of the enclosing sediments. Most of the greenstone bodies are lens-shaped parallel to the strike of the enclosing rocks but appear to be more continuous down the dip.

The granodiorite (7a) is medium grained and equigranular. Biotite and hornblende are the common mafic minerals. The granodiorite grades into porphyritic quartz monzonite (7b) with a groundmass similar to the granodiorite but containing up to 70 per cent coarse microcline and orthoclase phenocrysts.

A few thin sill-like bodies of quartz porphyry (8) are present. They consist of fine-grained quartz and alkali feldspar with phenocrysts of quartz and more rarely feldspar.

The structural relationships suggest two periods of deformation; one characterized by numerous complex isoclinal folds and the other by a few open folds, such as the anticline on the north side of Mayo Lake. The complex isoclinal folding shows well in the vicinity of several of the greenstone bodies and in thin quartzite beds. Several of the greenstone bodies terminate in the nose of an isoclinal fold and the bedding planes of the enclosing strata were traced around the nose of the body. Small complex isoclinal folds are common in the massive quartzite (2) east of the depression between the Keno Ladue valley and Roop Creek. In many of these folds thinner beds of quartzite commonly 2 to 3 inches thick have been deformed plastically into isoclinal folds whose axial planes are parallel to the bedding. In folds of this type individual beds may be repeated many times in a small outcrop. The axes of the folds plunge southeast and in most cases the upper beds have moved to the northeast. The orientation of these folds contrasts with that of similar folds on Keno and Galena Hills, which show flat lying axes trending roughly east and west. Both types of structure may indicate the presence of much larger complex structures, which may have produced the apparent repetition of lithological units. The axes of isoclinal folds in the eastern part of the map-area may have been rotated from an original east-west direction to a southeasterly plunging direction by later deformation.

The pronounced change of regional strike in the eastern half of the map-area and the syncline and anticline along Mayo Lake may also have been produced by later deformation. Lineations, shown by wrinkles on the bedding planes and crumples in the less competent members, all trend east to southeast and plunge southeast. They too appear to be related to the later deformation.

Approximately 5 tons of argentiferous galena has been mined and shipped from small discontinuous stringers near the summit of Cobalt Hill. Scheelite occurs along the granodiorite contact northeast of Wilsons Cabin.

Several small areas of iron-cemented conglomerate are shown on the map. The conglomerate contains pebbles and boulders of the adjacent country rock in a limonitic matrix. These bodies are of very local extent and few exceed 100 feet in diameter. The source of the iron was not observed but the location of several of the bodies near the base of a slope suggests that they were formed by solutions carrying iron derived by the oxidation of iron sulphides higher up the slopes. The sulphides may be present as lenses or disseminated through the country rock.

An iron-bearing spring on the north side of Keno Ladue valley has deposited earthy limonite, hematite and calcite over a small area. Assays of this material show traces of silver.

The quartzites (2) are similar to those of Keno and Galena Hills and are probably the most likely of the sedimentary rocks to contain mineral deposits.

MAP 5-1956

MAYO LAKE

YUKON TERRITORY

Scale: One Inch to One Mile = $\frac{1}{63,360}$

Miles

1 ½ 0 1 2 3

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