CANADA
DEPARTMENT OF MINES AND RESOURCES
MINES AND GEOLOGY BRANCH
BUREAU OF GEOLOGY AND TOPOGRAPHY

GEOLOGICAL SURVEY

DESCRIPTIVE NOTES

The area is reached by motor road from Mayo, on Stewart River, or by means of small power boats on McQuesten River. There is an air field at Mayo; or planes may land on Stewart River or on Mayo, Hanson, Ladue, or McQuesten Lakes. A winter tractor road formerly led from Keno to Beaver River by way of the divide to Lime Creek and thence north up the valley of East McQuesten River. Pack-horses can be used in every part of the area in summer.

Within the map-area the Yukon group has been separated, for mapping purposes, into three conformable divisions. The lowest, or basal, division (1) is composed of mica, graphite, and chlorite schists and quartzite. The next division (2) consists mainly of massive beds of blue-grey and white, fine-grained quartzite, but is interbedded with minor amounts of schists, similar to those of the underlying division, and a few thin limestone beds. The lower part of the uppermost division (3) contains much graphite schist, interbedded with mica and chlorite schists, and beds of quartzite similar to those of the underlying division. Limestone lenses, as much as 100 feet or more in thickness, recur persistently a few hundred feet above the base. Graphite schist is especially prominent east of Galena Hill, but there is less of it to the north and west. Overlying strata comprise a great thickness of quartz-mica schist and micaceous quartzite, and some mica and chlorite schists. They are featured by the occurrence of small, scattered pebbles that give these highly altered rocks a distinctly porphyritic appearance. However, some pebbles are quite large and their detrital character is readily recognizable. The uppermost strata of this division (3), notably in the area west of Secret Creek, include beds of fine-grained, massive quartzite similar to those of the intermediate division (2).

The Yukon group forms a roughly dome-shaped structure, most of which lies east of the map-area. A large anticlinal nose with a steeply dipping southern limb extends westward from the dome along McQuesten valley. A second, smaller anticlinal nose protrudes along Lynx Creek valley. North of Potato Hills and Sprague Creek the Yukon strata dip northward under a younger sedimentary group (4).

The younger group of sedimentary rocks (4) is, as a whole, much less metamorphosed than the Yukon group. The quartzite and sandstone are massive, characteristically coarse grained, and contain pebbles. Some arkose is present. Much of the slate is black and graphitic, but red, brown, and green slates are also present. Variations from shaly to schistose types were observed. The limestone that forms much of the south face of Steamboat Mountain is thought to be part of this group. At most places the strata, like those of the Yukon group, dip at angles of from 15 to 30 degrees, but on both sides of lower Eagle Creek they steepen to 60 or 70 degrees. North of Sprague Creek the contact between the two groups is structurally discordant, suggesting an unconformity.

In Gustavus Mountains, including Keno and Galena Hills and Mt. Haldane, are numerous, flattened, pipe-like bodies of hornblende-rich diorite and gabbro. They intrude the Yukon group and may be related to other diorite bodies (5b) in the area.

The map-area includes a large number of small stocks, bosses, dykes, and sills of granodiorite and allied porphyry, pegmatite, and aplite (5a). These rocks are typically light grey. Quartz, white feldspar, and biotite are the chief constituents; a little hornblende is also present. Quartz porphyry dykes and sills found at Keno Hill, Galena Hill, and Mt. Haldane are believed to belong to this group of intrusions. The rock is typically uniform in grain, but in places contains feldspar phenocrysts. The intrusions shown are in alignment with two rows of bodies of similar rocks that extend northwest and southeast of the map-area.

The map-area occupies part of a district in which the glaciers formed during the last, main stage of Pleistocene glaciation wasted away. These glaciers filled the valleys along the east border of the map-area to an elevation of about 5,000 feet. They moved westward, scouring the bottoms and lower slopes of the deep valleys and depositing morainic materials in the declivities on either side. Valleys sheltered from this glacial advance, but opening into the main ice-filled valleys, were dammed back by the ice, and glacial stream debris was deposited in them. Dublin Gulch and Haggart Creek are believed to have been protected from this last glacial advance by the hills to the east, but there is evidence in Dublin Gulch of an earlier stage of Pleistocene glaciation during which the ice rose much higher than during the last stage. The limit of last glaciation, shown on the map, indicates the height to which the ice rose and above which normal erosion continued. This limit is well marked in a few places, but elsewhere its position can only be judged approximately.

Importance is attached to three factors in prospecting in this area. These are: the granodiorite intrusive bodies (5); structures in the sedimentary rocks (1, 2, 3, and 4); and the effect of Pleistocene glaciation.

The granodiorite intrusions are regarded as the source of the wide variety of mineral deposits in their vicinity. The most important of these, including both lode and placer deposits, contain ores of gold, tungsten, antimony, and tin. The origin of the silver-lead deposits is less certain. Ores of all these metals have been found associated with almost every one of the granodiorite bodies. They occur as vein, contact metamorphic, and placer deposits. Gold and tungsten are present in all three types. Antimony, silver, and lead have been found in veins, and tin in placer deposits. The tungsten minerals are scheelite and ferberite. Besides its occurrence in the placers, scheelite is found in quartz veins and in contact deposits in altered limestone. Contact deposits are more likely than veins to contain a large tonnage of ore. Ferberite has been found only in placers and commonly adheres to vein material. Tin occurs in pebbles of finely crystalline cassiterite associated with tourmaline, quartz, and chlorite. The pebbles are brown or greenish. The cassiterite itself resembles coagulated brown sugar and is very different in appearance from the "wood tin," found in the Klondike placers. Cassiterite pebbles have been found in Dublin Gulch and in Haggart, Arizona, and Clear Creeks, and are reported in a number of other streams. In Dublin Gulch cobbles weighing several pounds, and composed mainly of cassiterite, contain angular fragments of quartzite, suggesting that their sources lie in a vein cutting the quartzite in the upper part of the gulch.

The importance of structure is brought out by the localization of the productive silver-lead veins along McQuesten Valley. The veins occur in quartzite (2) on the steeper side of the anticlinal nose, where the strata are the more fractured. This suggests that the other anticlinal nose of Lynx Creek Valley is a promising area for prospecting. It also directs attention to quartzite as a favourable rock for the development of vein-bearing fractures.

Prospectors were first attracted to the district by its placer gold deposits. The chief of these were close to areas containing bodies of granodiorite, as, for instance, the Dublin Gulch and Highet Creek deposits. These placers formed in areas sheltered from glaciation by the high hills to the east, and so remained undisturbed by the ice. Not only did glaciation limit the more favourable area for placer deposits, but to a considerable degree this was also the area prospected for lode deposits. Consequently, the area to the southeast, in which other granodiorite bodies occur, has remained relatively unexplored in spite of the fact that the intrusions there promise the same wealth of mineralization as those in the glaciated country. This applies particularly to the granodiorite area on Roop Creek northeast of Mayo Lake.

LEGEND

MESOZOIC AND (?) LATER

JURASSIC AND (?) LATER

5a, granodiorite, minor quartz porphyry, pegmatite and aplite. 5b, diorite and gabbro

PRECAMBRIAN AND (?) LATER

4 — Quartzite, sandstone, arkose, slate, conglomerate, limestone

YUKON GROUP

3 — Schist, quartzite, limestone

2 — Mainly quartzite, minor schist and a little limestone

1 — Schist, quartzite

Limit of last glaciation

Drift-covered area

Geology by H. S. Bostock, 1942.

Road

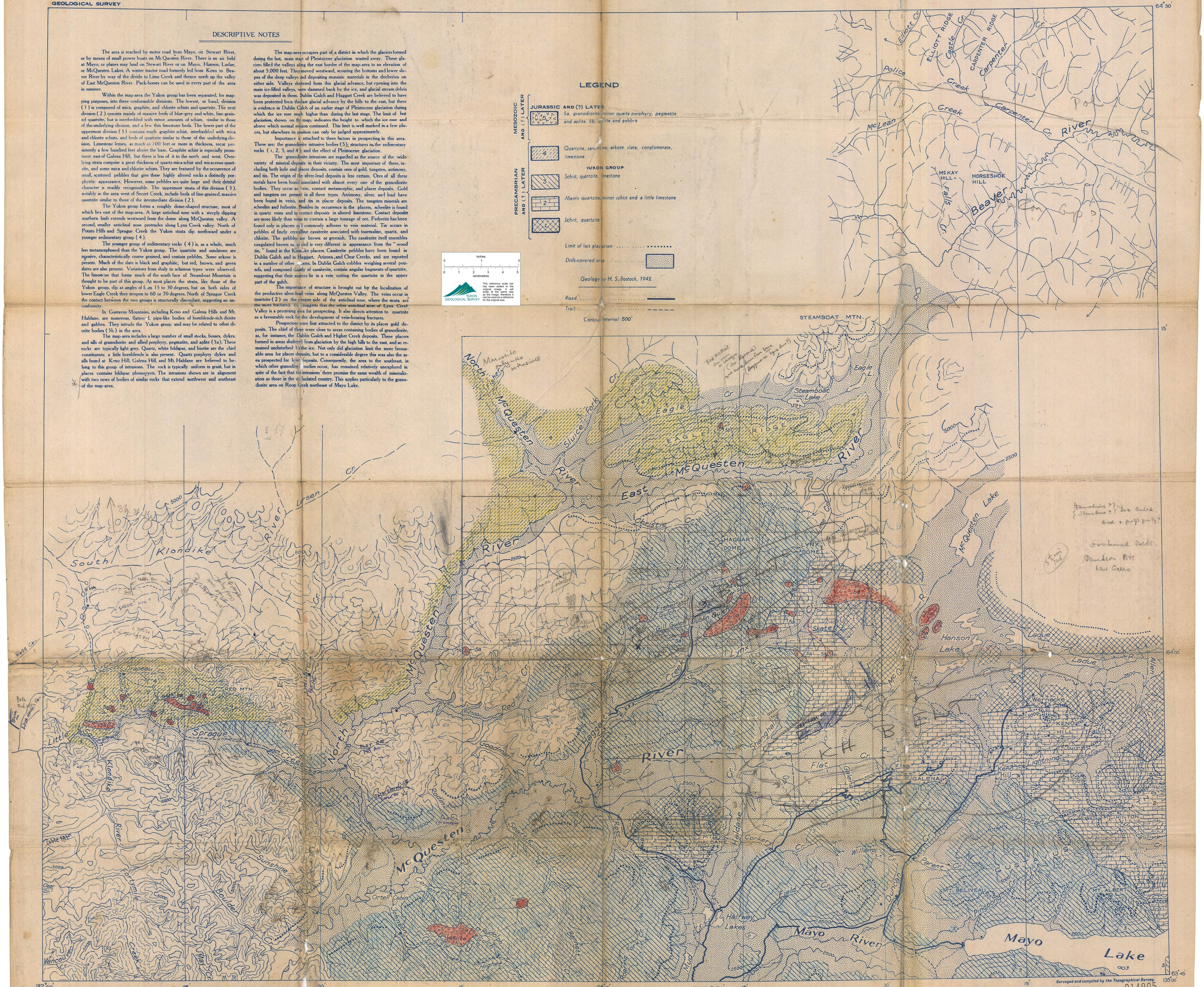
Trail

Contour interval 500'

inches 0 1 2; 0 1 2 3 4 5 centimetres

YUKON GEOLOGICAL SURVEY

This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.



Surveyed and compiled by the Topographical Survey.
Issued 1943.

014905

PRELIMINARY MAP 43-9