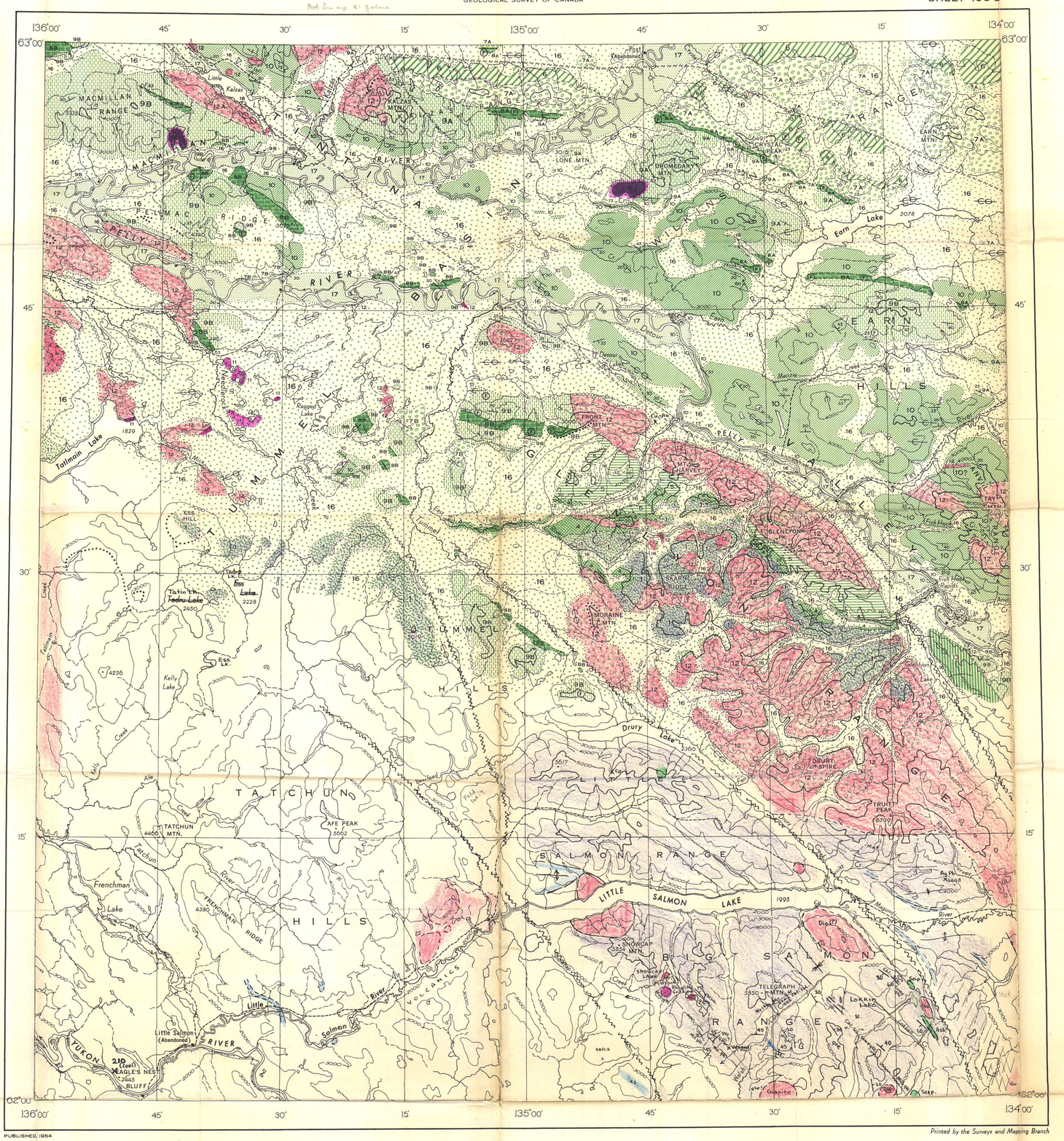
CANADA
DEPARTMENT
OF
MINES AND TECHNICAL SURVEYS

GEOLOGICAL SURVEY OF CANADA

GLENLYON
105L.

SHEET 105 L



LEGEND

CENOZOIC

QUATERNARY
RECENT

17 — *Alluvium, silt, sand, gravel; stream and flood plain deposits*

PLEISTOCENE AND RECENT

16 — *Glacial gravel, sand, silt, and clay; bog deposits; volcanic ash*

TERTIARY (?)

14, 15 — 14. *Granite (quartz-feldspar) porphyry*
15. *Rhyolite (quartz) porphyry*

13 — *Andesite and some rhyolite and basalt lava; minor tuff and conglomerate*

MESOZOIC

JURASSIC AND/OR CRETACEOUS

11, 12 — 11. *Monzonite, syenite; minor diorite and mafic rocks*
12. *Quartz monzonite; granodiorite; minor granite and quartz diorite may be younger than 13*
12A. *Highly altered, schistose, granitic rocks*

CARBONIFEROUS (?) TO CRETACEOUS (?)

10 — *Andesite, andesitic tuff and breccia; diorite, basalt, slate, slaty limestone; chloritic and sericitic schist; local conglomerate, shale, carbonaceous shale, and sandstone*

PALÆOZOIC

CARBONIFEROUS
MISSISSIPPIAN AND/OR LATER

9A, 9B — 9A. *Thin-bedded chert, quartzite, argillite, and limestone*
9B. *White, grey, and dark coloured quartzite, slate, argillite, cherty tuff; sericitic and chloritic schist; in part older than 8B*

MISSISSIPPIAN

8A, 8B — 8A. *Dark grey and black, crystalline, crinoidal limestone*
8B. *White and light grey to buff coloured, crystalline limestone, locally crinoidal*

CARBONIFEROUS AND/OR EARLIER
MISSISSIPPIAN AND/OR EARLIER

7A, 7B — 7A. *Chert-conglomerate and breccia; minor quartzite, slate, and bedded chert*
7B. *Chert-conglomerate, quartzite, slate, and bedded chert*

6 — *Dark, bedded chert, varicoloured slate, sandstone, quartzite, limestone, and conglomerate*

PRE-CARBONIFEROUS
HARVEY GROUP (4, 5)

5 — *Slate, sericite-chlorite schist, hornfels*

4 — *Crystalline limestone; sericite schist, lime-silicate gneiss, skarn, minor slate*

PRECAMBRIAN AND/OR PALÆOZOIC

3 — *Gneissose granitic rocks*

YUKON GROUP (1, 2)

2 — *Massive, grey, crystalline limestone*

1 — *Micaceous quartzite, quartzite, quartz-mica schist, limestone; minor amphibolite.* 1a, *lime-silicate zones in small limestone lenses in Glenlyon Range*

Bedding (inclined, vertical)
Fault (defined, approximate, assumed)
Lateral moraine or kame terrace at limit of last glaciation
Glacial striæ
Direction of ice flow indicated by drumlins or large rock grooves
Fossil locality (F)

Geology by R. B. Campbell, 1949, 1950, 1951, 1952, 1953

Cartography by the Geological Cartography Division, 1954

DESCRIPTIVE NOTES

The map-area occupies part of Yukon Plateau. Pelly and Macmillan Rivers provide the easiest means of access; both streams are navigable for small craft at all stages of water. Pack-horses may be used throughout the area in summer.

Rocks of the Yukon group (1,2) comprise a large but unknown thickness of metamorphosed sedimentary rocks that are characteristically quartzose and biotitic and include lenses of massive, light grey to buff, crystalline limestone (2), some of which are too small to map but which contain lime-silicate zones (1a) in Glenlyon Range. The Yukon group in Glenlyon Range, Tummel Hills, and around Tadru Lake may be metamorphosed Palæozoic rocks, but no proof of this has yet been found.

The gneissose granitic rocks (3) have been assigned to the Precambrian because of their similarity to rocks considered that age in adjoining districts.

The Harvey group (4,5) of metamorphosed sedimentary rocks overlies the Yukon group, possibly conformably. The lower division of the group (4) comprises about 500 feet of dominantly calcareous rocks, which are thinly bedded, a feature that is retained in the gneiss and skarn. The upper division (5) is characterized by argillaceous (slaty) rocks, which, near granitic contacts, are altered to slaty biotite-andalusite hornfels and locally to dense orthoclase hornfels. This division is more than 4,500 feet thick, but the upper part is everywhere in contact with granitic rocks or is concealed.

The rocks of map-units 6 to 9 inclusive are difficult to correlate across Tintina Valley. No counterpart of map-unit 6 has been recognized southwest of the valley but part of unit 9B may correspond to it. The rocks of map-unit 6, poorly exposed in Glenlyon map-area, occur to the north in Mayo map-area, where the varicoloured slates are mapped as a separate unit.

Excellent sections of chert-conglomerate (7A), 4,500 feet thick, are exposed in Kalzas Range, Crystal Peak, and Earn Mountain. Fragments in the conglomerate are rounded to subangular and are rarely more than ½ inch in diameter, the larger being the more rounded. Chert comprises from 30 to 90 per cent of the fragments, but the matrix is quartzose or argillaceous rather than cherty. The chert-conglomerate (7A) underlies, apparently conformably, the early Mississippian limestone (8A). A few poor exposures of chert-conglomerate (7B) occur along Tummel River but the section there is thinner and includes more argillaceous rocks than northeast of Tintina Valley. Highly sheared strata, which may have been chert-conglomerate, outcrop on Pelly River about 14 miles above the mouth of Macmillan River, and are associated with black, bedded chert, slate, and quartzite. It is possible that map-units 7A and 7B are not equivalent.

The early Mississippian limestone (8A) contains fossils that relate it to the Banff formation of the Rocky Mountains. The limestone (8B) southwest of Tintina Valley contains poorly preserved fossils that have been tentatively correlated with those of map-unit 8A, but it probably represents more than one limestone horizon and at best can be only partly equivalent.

Bedded, varicoloured chert comprises most of map-unit 9A near Earn Lake, whereas on Dromedary Mountain quartzite is relatively more abundant and on Kalzas Mountain argillite and quartzite predominate. The contact with the underlying limestone is thought to be conformable but the relationship is obscure. The top is unknown and the strata are contorted but the unit may be over 10,000 feet thick. Map-unit 9B represents a group of undivided Palæozoic rocks that are poorly exposed and that have an uncertain stratigraphic sequence. White and grey quartzite is associated with the limestone (8B) in the north end of Glenlyon Range, Pelmac Ridge, and Macmillan Range. On the northeast side of Tummel Hills chloritic quartzite, chlorite schist, and varicoloured slates lie to the west of, and probably beneath, the limestone (8B), and may be equivalent to part of map-unit 6. In the western parts of Pelmac Ridge and Macmillan Range rocks of map-unit 9B have been altered by low-grade metamorphism.

Rocks of map-unit 10 unconformably overlie the older strata. The lower part of the group between Tay and Macmillan Rivers consists dominantly of volcanic rocks. Most, if not all, of the andesite is lava, part of which is glassy. The centres of some thick flows are, however, fine to medium grained. In the upper part of the group, near Tintina Valley, the rocks are dominantly sedimentary, with some intercalated flows. Northwest and southeast from the mouth of Harvey Creek, conglomerate, with sandstone and carbonaceous shale, forms the highest exposed strata of this group, and may be altogether younger rocks. Carbonaceous shales, with green slaty tuff, andesite, and bedded chert, also occur at Big Fish Hook Rapids. The fragments in the conglomerate are pebbles and cobbles of rocks similar to those of map-unit 9B found in the extreme northwestern end of Glenlyon Range. No granitic or andesitic fragments were observed. The age of map-unit 10 is assumed to range from Carboniferous (?) to Cretaceous (?) to agree with the age designation of similar rocks in other parts of Yukon. It may be continuous with rocks considered Triassic or older in MacArthur Range in Mayo map-area. The conglomerate and carbonaceous shales can, perhaps, be correlated with the Tantalus formation of Upper Jurassic or Lower Cretaceous age. Fossil plants in similar rocks farther up Pelly River Valley suggest an Upper Cretaceous age.

The plutonic rocks (11,12) are considered to be the same age as similar rocks in other parts of Yukon. The quartz-poor rocks (11) are generally coarse grained and contain large phenocrysts of feldspar, and may contain locally as much as 80 per cent hornblende and augite. A narrow band of medium-to coarse-grained, equigranular syeno-monzonite outcrops along the northeast side of Glenlyon Range.

The granitic rocks (12) are dominantly medium grained and equigranular but include some porphyritic phases. Biotite is the most common mafic mineral. These rocks are extraordinarily uniform in composition and texture over large areas. Many granitic dykes and sills, too small to map occur in the Yukon group in Glenlyon Range.

The andesites of map-unit 13 are altered about as much as those of map-unit 10. They are cut by granite (feldspar) porphyry dykes and in places dip up to 55 degrees. They resemble Tertiary volcanic rocks in other parts of Yukon, and their relation to conglomerate farther up Pelly River suggests that they may be of Tertiary age.

The intrusions of map-units 14 and 15 are associated with Palæozoic strata only and cannot be closely dated. They are, however, similar to siliceous Tertiary intrusions that occur in many parts of central Yukon.

Glacial outwash and till (16) are as much as 500 feet thick in some localities. Till is commonly overlain and underlain by bedded deposits. In Macmillan River Valley, and Pelly River Valley for several miles above the mouth of Macmillan River, there is at least 100 feet of buff to grey clay that may be a lacustrine deposit.

Tintina Valley is thought to mark the locus of a major zone of faulting because neither the Palæozoic section nor the belt of rocks of map-unit 10 are continuous across it. A fault also seems to be the best explanation of the repetition of the chert-conglomerate in the northern part of the area.

Folds in most of the area mapped trend north 60 to 70 degrees west and plunge gently to the west. In Tummel Hills, however, the trends are apparently more nearly northwest.

The part of Glenlyon Range mapped to date is favourable for prospecting. The rocks of the upper member of the Harvey group (5) close to the batholith along the northeast side of the range, contain much disseminated iron sulphide, and concentrations may occur. The limy rocks of map-unit 4 and the lime-silicate zones (1a) in the Yukon group should be favourable for mineral deposition.

Much of the andesite of map-unit 10 contains disseminated iron sulphide, but little other mineralization was seen. Some shale of this unit is carbonaceous and coal may possibly be found in it.

No extensive mineralization has yet been found in the Palæozoic strata (6 to 9) but there is no apparent reason for them to be entirely barren.

Most of the valleys in Glenlyon map-area are floored by glacial deposits and many have been deepened and scoured by glaciation. No pre-glacial gravels of significant size have been found, and below the limit of glaciation important placer deposits are not to be expected.

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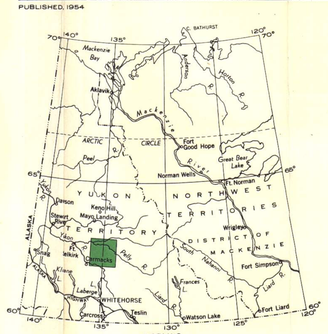
YUKON TERRITORY
NORTHWEST TERRITORIES
DISTRICT OF MACKENZIE
WHITEHORSE
Watson Lake
Fort Liard
Fort Simpson
Norman Wells
Inuvik
Aklavik
Dawson
Mayo
Keno
Carmacks
Teslin
Frances
Lake
Macmillan
Pelly
Stewart
Pelly
Ross
Hess
Hume
Mackenzie
Bay
Great Bear Lake
Great Slave Lake
Fort Good Hope
ARCTIC CIRCLE
Peel
Wrigley
Jean Marie River
Nahanni Butte
Fort Wrigley
Fort Providence
Fort Rae
Yellowknife
Rae
Gordon
Aklavik
Reindeer
Thelon
Dubawnt
Kazan
Ennadai
Churchill
Nelson
Seal
Churchill
Grass
Porcupine
Bathurst
Coppermine
Dease
Hare Indian
Liard
Frances
Pelly
Macmillan