GEOLOGICAL SURVEY OF CANADA
DEPARTMENT OF MINES AND TECHNICAL SURVEYS

PRELIMINARY SERIES

SHEET 105 L

LEGEND

CENOZOIC

QUARTERNARY
RECENT

29	Stream deposits; sand, gravel, and silt

PLEISTOCENE AND RECENT

28	Glacial sand, gravel, silt, clay and till; volcanic ash, bog deposits, and soil

TERTIARY

27	27a, basaltic flows; minor shale and conglomerate; 27b, trachytic and basaltic flows; may be younger than 27a
26	26a, granite (quartz-feldspar) porphyry; 26b, rhyolite (quartz) porphyry

MESOZOIC

JURASSIC AND/OR CRETACEOUS AND (?) EARLIER

25	25a, biotite granodiorite and quartz monzonite; minor leuco-quartz monzonite and biotite-hornblende quartz diorite; 25b, biotite-hornblende granodiorite, quartz monzonite, and quartz diorite; 25c, augite-hornblende monzonite and syenite; minor diorite and mafic rocks; 25d, gneissose granitic rocks

UPPER JURASSIC (?) AND LOWER CRETACEOUS (?)
TANTALUS GROUP (?)

24	Chert pebble and cobble conglomerate, and sandstone

JURASSIC
LOWER JURASSIC AND LATER
LABERGE GROUP

23	Arkose and conglomerate; sandstone, siltstone, and argillite

TRIASSIC
UPPER TRIASSIC
LEWES RIVER GROUP

22	Grey limestone
21	Basaltic and andesitic volcanic rocks, conglomerate, and greywacke

PALAEOZOIC

MISSISSIPPIAN OR LATER

20	Conglomerate, shale, and sandstone
19	Andesitic and basaltic flows, breccia, and tuff; diorite; slate, phyllite, slaty limestone, chert, and carbonaceous shale
18	Andesitic and basaltic flows, breccia, and tuff; minor rhyolite breccia and argillite
17	Grey crystalline limestone and limestone breccia and conglomerate (in part interbedded with 18; may represent several limestone units)
16	Serpentinite

MISSISSIPPIAN AND (?) LATER

15	Thin-bedded chert, argillite, and quartzite; minor limestone

MISSISSIPPIAN
LOWER MISSISSIPPIAN

14	Dark grey and black crystalline limestone; minor argillite and chert

MISSISSIPPIAN AND/OR EARLIER

13	13a, metamorphosed volcanic rocks; greenstone and greenschist (hornblende-albite-epidote-quartz rocks); quartz-chlorite schist, argillite, and limestone; 13b, 13a with many small bodies of serpentinite
12	12a, metamorphosed greywacke (quartz-hornblende-epidote-albite-biotite-chlorite schist), grey sericitic and chloritic quartzite, white sericitic quartzite, greenstone, limestone, and lime-silicate rocks (uncertain stratigraphic relationships to 12b and 13a); 12b, feldspathic, sericitic quartzite, limy quartzite, shale, argillite, varicoloured slate, greenstone, and limestone; 12c, 12b in a complex with altered and sheared granitic rocks
11	Grey crystalline limestone, locally crinoidal (interbedded with 12 and 13; probably represents several limestone units)
10	Chert pebble and cobble conglomerate, slate, sandstone, and greenstone
9	Grey and brown chert pebble and cobble conglomerate and breccia; minor quartzite, slate, and bedded chert
8	Dark, bedded chert, varicoloured slate, sandstone, quartzite, limestone, and conglomerate

SILURIAN (?) AND DEVONIAN (?)

7	White and grey quartzite, dolomitic quartzite, slate and argillite
6	Grey and buff dolomite, siliceous dolomite, and grey slaty limestone (interbedded with 7; may represent two carbonate units)

CAMBRIAN (?) AND/OR ORDOVICIAN (?)
MIDDLE AND UPPER CAMBRIAN (?) AND/OR ORDOVICIAN (?)

5	Thin-bedded shale, argillite, and siliceous limestone; rhyolitic tuff and flows; greenstone and minor hornfels (may, in part, be equivalent to 4)
4	Slate, phyllite, spotted slate, and hornfels

CAMBRIAN (?)
LOWER AND/OR MIDDLE CAMBRIAN (?)

3	Thin-bedded, grey and buff, crystalline limestone, phyllitic limestone, lime-silicate gneiss, and skarn

CAMBRIAN (?) AND/OR EARLIER (?)
LOWER CAMBRIAN (?) AND/OR EARLIER (?)

2	Limestone, lime-silicate gneiss, amphibolite, and skarn; minor quartzose rocks (beds and lenses within 1 and inclusions within 25a)
1	Micaceous quartzite and quartz-mica schist; minor limy rocks

R	Metamorphic rocks

Geological boundary (defined, approximate)

Bedding (inclined, vertical, tops not indicated)

Bedding (overturned)

Schistosity (inclined, vertical)

Fault (defined, approximate, assumed)

Anticline, approximate

Syncline, approximate

Fossil locality

Mineral occurrence (lead Pb, zinc Zn) × Pb, Zn

Geology by R. B. Campbell, 1949 to 1954 and J. O. Wheeler, 1956.
Descriptive notes by R. B. Campbell

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

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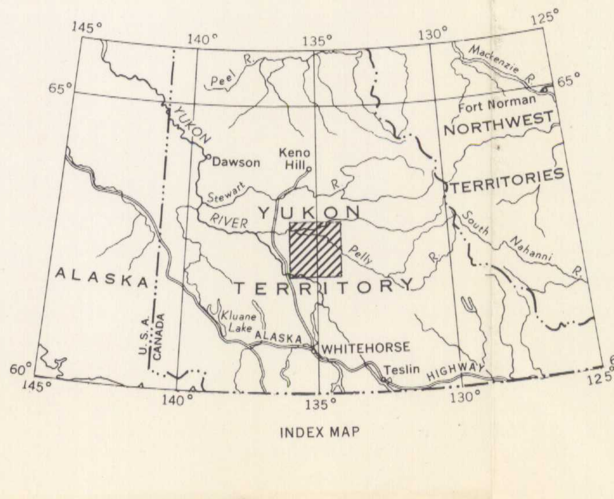

INDEX MAP

MAP 25-1960
GEOLOGY
GLENLYON
YUKON TERRITORY

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

Miles

4 2 0 4 8 12

Approximate magnetic declination, 33° 04' East

LEGEND

Trail

Cabin

Telephone line

Intermittent stream

Marsh

Sand or gravel

Contours (interval 1000 feet)

Height in feet above mean sea-level ... 1995

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

DESCRIPTIVE NOTES

Pelly and Macmillan Rivers provide easy access to the map-area; both are navigable with small craft at all stages of water. Pack-horses may be used throughout the area in summer.

Tintina Valley is the locus of a major geological discontinuity across which the sedimentary sections are very different, though they may be, in part, of the same age. The map-units on either side of this break are shown in the legend in a continuous column; but it should not be construed from this that the relative ages of the units from one side of the valley to the other are known. The legend should be regarded as a combination of two legends which can be related only in a general way. This problem arises mainly from the fact that only one unit, the Lower Mississippian limestone (14), yielded fossils from which a definite age could be determined.

The sequence of quartzose rocks (1) overlain by limy rocks (3) followed by argillaceous rocks (4) in Glenlyon Range reflects the general succession of the Proterozoic and Cambro-Ordovician strata in Pelly and Cassiar Mountains to the southeast. There is no direct stratigraphic relationship between unit 5 and any of the other strata, but the lithological character of this unit suggests that it should be correlated with Cambro-Ordovician rocks to the southeast.

The rocks of units 6 and 7 are characterized by dolomite and pure quartzite and are correlated with lithologically similar Siluro-Devonian rocks in Pelly Mountains.

The Palaeozoic rocks northeast of Tintina Valley (units 8, 9, 14, and 15) have no known counterparts southwest of the valley but they may be related to Upper Devonian and Mississippian rocks in northern Yukon and Alaska. Perhaps the most noteworthy feature of this section is the 4,000 to 5,000 feet of chert-pebble conglomerate (9) which underlies the Lower Mississippian limestone (14).

The rocks southwest of Tintina Valley, believed to be Mississippian, have correlatives to the south. The clastic rocks of unit 10 are similar to Mississippian strata in the eastern part of Pelly Mountains. The limestone (11), and the metasedimentary and sedimentary rocks (12) together with the volcanic rocks (13), can be correlated with similar rocks that are at least partly of Mississippian age, in the western part of Pelly and the northern part of Cassiar Mountains. The exact thickness and sequence of these rocks is not known because of the poor exposure and complex structure, but there is no doubt that their total thickness is great.

Serpentinite (16 and included in unit 13b) occurs in small bodies known only within the volcanic rocks of unit 13. It may therefore be as old as Mississippian.

The volcanic rocks (18) around Little Salmon River are poorly exposed and their stratigraphic relationships are obscure. Some of the limestone (17) associated with these rocks has been found by others to contain upper Palaeozoic fossils, and similar rocks in another area have been found to underlie the Upper Triassic Lewes River group. The metamorphism in these volcanic rocks is less intense than that in the rocks around Little Salmon Lake (12). The evidence suggests that they are post-Mississippian and pre-Upper Triassic; they might be assigned a Permo-Triassic age.

The volcanic and sedimentary sequence of unit 19 apparently lies unconformably above the Lower Mississippian limestone (14) and related strata (8, 9, and 15). Granitic rocks, which may be as young as Upper Cretaceous, cut the rocks of unit 19. These two factors provide the only limits known at present to the age of unit 19. However, the nature of the component rocks suggests that the age is most probably late Palaeozoic or early Mesozoic. Unit 19 is characterized by the presence of green andesitic volcanic rocks which are usually aphanitic but may be fine-grained diorite in the centres of some thick flows. The unit may include small dioritic intrusions. North of Little Kalzas Lake and on the high ridges of Tay Mountain no volcanic rocks were observed, and the strata in these places may have no equivalents elsewhere. At the mouth of Harvey Creek and at Big Fish Hook Rapid, carbonaceous shale occurs with the rocks of this group.

The conglomerate of unit 20 contains fragments similar to the rocks of units 6 and 7 and is not known to include granitic or volcanic types. It seems probable that these beds are younger than the rocks of unit 19. They may be Cretaceous in age.

The volcanic rocks (21) that are included in the Lewes River group have been mapped differently in adjoining areas. In Glenlyon area they appear to underlie the Upper Triassic limestone (22) but they have lithologic differences to the rocks of unit 18 with which they might otherwise be correlated. Similar rocks, in an area to the south, have been placed within the Lewes River group.

The basal section of the Laberge group (23) is composed mainly of conglomerate and may be more than 4,000 feet thick. The fragments, which reach boulder size in the conglomerate, are composed mainly of volcanic rocks with subordinate granitic and sedimentary types. The upper beds of the group are a large but unknown thickness of grey and brown arkose with minor conglomerate.

Two small outcrops of conglomerate (24) are believed to be part of the Tantalus group. South of the map-area, near these outcrops, similar conglomerate is well exposed and is definitely part of that group.

In a general way the granitic rocks may be divided into two types separated by the assumed fault that passes through Drury Lake valley. In the granitic rocks (25a) northeast of this fault, biotite is, with but minor exceptions, the sole mafic mineral, whereas to the southwest (in unit 25b) hornblende and biotite are in general equally common, although here and there biotite only or hornblende only may be present. The granitic rocks northeast of the fault tend to be more equigranular and more uniform in composition than those to the southwest.

Fine-grained intrusions (26a and 26b) cut Palaeozoic rocks only and cannot be closely dated. But they are similar to siliceous Tertiary intrusions found in many parts of the Yukon.

The basalt of unit 27a is not associated with any apparent volcanic topographic forms and the flows have been, to some extent folded. The trachyte and basalt of unit 27b, on the other hand, is related to a dissected volcanic cone and the flows are not known to be folded.

Glacial deposits vary greatly in type and thickness from place to place. Locally such deposits, including both outwash and till, are 500 feet thick. In the valleys of Macmillan River and Pelly River for some miles above the mouth of Macmillan River there is up to 100 feet of buff and grey clay and silt that may be a lacustrine deposit.

Large through-going faults seem to provide the best explanation for the discontinuous nature of the geology in Glenlyon area. The faults are speculative, but in general they bound blocks in which some features of the geology are not repeated in any of the adjoining blocks and the evidence for their existence seems to be good. So profound is the break in the geology across Tintina Valley that it seems reasonable to assume that the valley represents the locus of a fault upon which there has been major horizontal displacement. The minor faults within Glenlyon Range have an apparent right lateral-displacement, taken in aggregate, of 10 miles or more. From this, it might be inferred that the bounding faults, and particularly that in Tintina Valley, have movements of even greater magnitude.

The trend of folds is N70°W to N80°W in the area northeast of the assumed fault that passes through Drury Lake valley, whereas generally it is more nearly northwest in the area southwest of the fault. Complex, folded recumbent folds may occur in the strata of units 11, 12, and 13, but in all the other stratified rocks the folding appears to be much less complicated.

Other than the lead-zinc deposit at the south end of Glenlyon Range, upon which some work has been done, no important sulphide deposits were observed in the area. Sparse, very short asbestos fibre was seen in some of the serpentinite bodies included in unit 13b. The intensity of glaciation seems to preclude the possibility of the discovery of important placers.

MAP 25-1960
GLENLYON
YUKON TERRITORY
SHEET 105L