GEOLOGICAL SURVEY OF CANADA
DEPARTMENT OF MINES AND TECHNICAL SURVEYS

PRELIMINARY SERIES

SHEET 105 K

LEGEND

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
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, tops unknown)
Foliation (inclined)
Fault (defined, approximate, assumed)
Anticline (arrow indicates direction of plunge)
Fossil locality
Mineral occurrence or prospect (lead, Pb; zinc, Zn) ×Zn

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

DESCRIPTIVE NOTES

During the summer the map-area is accessible by motor vehicle on the Canol Road as far as Pelly River. Pelly and South Macmillan Rivers can be used by small boats to reach the southern and northern parts, respectively. Numerous lakes, suitable for float-equipped aircraft, are scattered throughout the map-area.

Ice covered all of the area during the Pleistocene, except possibly the highest peaks. It moved west and northwest along the major valleys.

Unit 1 is a sequence of mainly quartzose, clastic rocks, best exposed east of Mount Selous. In Nahanni map-area these rocks are overlain, probably unconformably, by limestone of probable Cambrian age, and are, therefore, considered to be late Precambrian. At several places in Tay River and Sheldon Lake map-areas, Ordovician strata (3) lie on light-coloured siliceous rocks consisting mainly of light grey to whitish quartzite, grey and brownish quartzite, banded hornfels, and skarn (1a). These rocks (1a) appear to comprise the upper part of unit 1, but owing to complex structure, the stratigraphic sequence of units 1a to 1d has not been firmly established. Unit 1c consists mainly of shales, of which the most easily recognized are green and maroon. They are exceptionally persistent along strike, but outcrop best east of the map-area. The lower part of unit 1 is characterized by massive, gritty, quartz-pebble quartzite (1d) interbedded with dark shales. The thickness of unit 1 is not known as its base is not exposed and it is complexly folded and faulted; but it is thought to exceed 10,000 feet.

Unit 2 was recognized only south of Tintina Valley. Most of the rocks in this unit are sheared and more or less phyllitic. The cleavage is at various angles to the bedding. As similar rocks were found in Quiet Lake map-area, in places overlying Lower Cambrian strata and in others underlying Ordovician strata, a tentative Middle and Upper Cambrian age has been assigned to this unit.

In the northern part of Tay River map-area the Precambrian rocks (1) are overlain unconformably by mainly black chert and shale (3) containing Ordovician and Silurian graptolites. These beds are limited in the map-area to the vicinity of South Macmillan River, but are more widespread to the east. The cherts are commonly thin bedded, and more or less silty. The thickness of these strata is probably about 10,000 feet, but poor exposures and extremely complex structure combine to prevent a reliable estimate.

Unit 4 outcrops in a structurally complex belt south of Tintina Valley. It is best exposed south of the map-area in the vicinity of Fox Mountain, where the thickness is perhaps as much as 5,000 feet. There, Silurian fossils were found in dolomitic siltstones low in the section, and Middle Devonian fossils in massive grey dolomite near the top. The Siluro-Devonian carbonate rocks, although prominent south of Tintina Valley, do not appear north of it in Tay River map-area, where Devono-Mississippian strata (5) are believed to lie unconformably on the Ordovician-Silurian rocks (3), although the contact between the two units is not exposed.

Unit 5 underlies much of the region between the Anvil and South Fork Ranges. It contains practically no type of rock that does not exist also in the Ordovician-Silurian strata (3), from which it appears to have been derived. Quartzite and limestone are, however, much more abundant in unit 5. The assigned age of the unit is based on Upper Devonian brachiopods from thin beds of silty limestone and chert (5c) between Stokes Lake and Tay River, and on Mississippian brachiopods from a silty sandstone (5c) near the centre of the map-area. The dark cherts of unit 5b are at least 1,500 feet thick on Twopete Mountain and northwest of the head of Blind Creek.

Massive chert-pebble conglomerate beds (5a) form conspicuous outcrops in the vicinity of Stokes Lake. At least two beds are represented in the unit. Most of the fragments are of dark grey chert and shale, but significant numbers of fragments in the beds north of Earn River consist of light grey quartzite. The conglomerate beds are not as prominent to the east, and may thin in that direction.

Mississippian brachiopods were found in a massive grey limestone bed (6) northeast of Twopete Mountain. The limestone is involved in the complex folding and faulting of unit 5.

The granitic core of the Anvil Range is flanked by units 7, 8, and 9. Most of these rocks are metamorphosed to some extent and locally, as in the vicinity of Blind Creek, to grades as high as coarse-grained staurolite-garnet-mica schist. As no fossils were found in the three units, nothing is definitely known as to their age except that they are older than the probably Cretaceous granitic rocks that cut them. They have been tentatively considered Mississippian (?) and/or younger (?) because volcanic rocks of that age, similar to those of unit 8, have been found in other Yukon map-areas. A Precambrian age has also been considered because of their outcrop pattern with respect to the granitic rocks and their high degree of metamorphism compared to the nearby unmetamorphosed Devono-Mississippian rocks (5), but no rocks like them were recognized in unit 1.

Unit 7 is several thousand feet thick. Near the granitic rocks the unit locally contains sulphide minerals. Unit 7 grades upward into material that is increasingly volcanic. The main volcanic assemblage (8) is in a belt that follows the northeast side of the Tintina fault zone for about 250 miles. Chloritization and shearing are common in these rocks, but, except in the immediate vicinity of granitic bodies, the grade of metamorphism is low. The conglomerate (9b) contains abundant volcanic material, and appears to overlie unit 8.

Unit 10 is predominantly sandy and shaly, and was found only in isolated exposures in Tay River valley. It contains Triassic pelecypods.

Granitic rocks (11) comprise the core of the Anvil Range and Mount Selous, as well as smaller stocks elsewhere in the map-area. These rocks are clearly intrusive, with sharp, crosscutting contacts and very rare xenoliths. Also rare in the granitic rocks is foliation, even near the Tintina fault zone. If these rocks are the same age as similar rocks dated in the Itsi Mountains (about 96 m.y.), they are Middle Cretaceous.

Shale, sandstone, and conglomerate (12), containing granitic pebbles and Paleocene plant fragments, were found in some of the tributaries entering Pelly River from the south. Similar, but less conglomeratic rocks are present in the valley of South Macmillan River.

Rather peculiar looking quartz and feldspar porphyries, of granodioritic composition (13), are associated with the volcanic rocks of unit 14 from Blind Lakes to the Canol Road (just east of the map-area). In several places the flows (14) appear to overlie the porphyries, but the actual contacts are covered. Apparent similarities in composition and close areal association suggest that the porphyries may have been feeders to, or intrusive equivalents of the flow.

Flows of unit 14 underlie much of the area between Tay River and the South Macmillan - Riddell river-system, and form the South Fork Range. The aggregate thickness exceeds 5,000 feet. Individual flows are rarely well-defined, but appear to range in thickness from about 10 feet to perhaps 300 feet, with many about 50 feet. Pyroclastic rocks comprise only a very minor proportion of the assemblage. The upper part is characterized by dark dacites with phenocrysts of quartz and biotite. The lower part is mainly andesitic and basaltic, commonly containing feldspar phenocrysts. The volcanic rocks are gently deformed. Maximum dips of about 30° were noted. The volcanic sequence lies unconformably on intensely deformed Palaeozoic strata. The unconformity varies in elevation through about 2,000 feet. This may be accounted for by faulting and deformation, but the flows were probably extruded onto a surface of at least moderate relief. The gentle deformation and the porphyritic, massive character of these rocks distinguish them from the older volcanic unit (8), which is rarely porphyritic and commonly sheared.

The main mineral discovery in the map-area is a lead-zinc prospect located on Vangorda Creek between Mount Mye and Pelly River. Although inactive now, it was extensively drilled by its owner—Vangorda Mines Limited. The deposit consists mainly of disseminated pyrite, galena, sphalerite, and minor chalcopyrite in gently dipping sericitic schists (7) near their contact with the granitic rocks (11).

PUBLISHED, 1961
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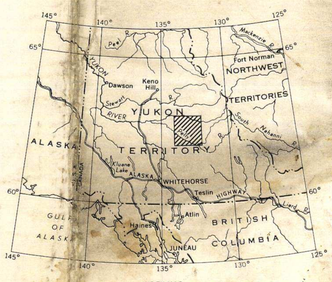

INDEX MAP

MAP 13-1961
GEOLOGY
TAY RIVER
YUKON TERRITORY

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

Miles 4 2 0 4 8 12

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

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.

YUKON GEOLOGICAL SURVEY

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R-SERIES

LEGEND

Road (dry weather)
Horizontal control point 5418
Intermittent stream
Marsh
Contours (interval 500 feet) 5000
Height in feet above mean sea-level 6627

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

Approximate magnetic declination, 34° 00' East

MAP 13-1961
TAY RIVER
YUKON TERRITORY
SHEET 105 K

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