GEOLOGICAL SURVEY OF CANADA
DEPARTMENT OF MINES AND TECHNICAL SURVEYS

PRELIMINARY SERIES

SHEET 93A (West Half)

LEGEND

CENOZOIC

QUATERNARY
PLEISTOCENE AND RECENT
22 — Glacial deposits and recent alluvium; till, gravel, sand, silt, and clay; few if any bedrock exposures

TERTIARY AND QUATERNARY
PLEISTOCENE AND EARLIER
21 — Basaltic breccia and tuff; minor flows

TERTIARY
MIOCENE AND/OR LATER
20 — Basaltic flows; minor tuff, conglomerate, and sandstone

PALEOCENE (?) TO MIOCENE (?)
19 — Sandstone, shale, and tuff

PALEOCENE AND/OR EOCENE
18 — Brown and buff rusty weathering dacite and rhyolite

MESOZOIC

JURASSIC AND/OR CRETACEOUS AND (?) EARLIER
17 — 17a, hornblende-biotite and biotite-quartz monzonite and granodiorite, minor hornblende-biotite syenite and monzonite; 17b, hornblende-biotite syenite and monzonite; 17c, hornblende diorite; 17d, muscovite granite and quartz monzonite including pegmatite; 17e, gneissose biotite granodiorite, altered and gneissose diorite, and augen granite (part of unit 17e may be Palaeozoic); 17f, trachyte porphyry (may be volcanic); 17g, green andesite and fine-grained diorite (may be volcanic)

JURASSIC (?) AND CRETACEOUS (?)
MIDDLE JURASSIC (?) TO CRETACEOUS (?)
16 — Green andesitic tuff, agglomerate, and flows; minor argillite, chert, and conglomerate

JURASSIC
MIDDLE (?) AND/OR UPPER (?) JURASSIC
15 — Dark green pyroxene-bearing andesitic agglomerate, breccia, and flows; minor tuff; may be equivalent to unit 14

14 — Green pyroxene-bearing andesitic agglomerate, breccia, and flows; minor tuff, argillite, and limestone; may be equivalent to unit 15

LOWER JURASSIC (?)
13 — Purplish brown, brown, and grey pebble and cobble conglomerate and sandstone; soft, friable, black and brown, carbonaceous shale, green shale; minor black limestone

LOWER JURASSIC
12 — 'Purple' volcanic rocks; purplish brown, dark grey, and rarely green pyroxene-bearing andesitic agglomerate, breccia, and flow; may contain analcite near contacts with units 10 and 11; minor limestone, argillite, and conglomerate

TRIASSIC AND/OR JURASSIC
UPPER TRIASSIC AND/OR LOWER JURASSIC
(may include MIDDLE JURASSIC)
11 — Green pyroxene bearing andesitic flows, agglomerate, and breccia; conglomerate, argillite, and limestone

TRIASSIC
UPPER TRIASSIC
10 — 10a, green and purplish brown pebble and cobble conglomerate and sandstone; 10b, green andesitic volcanic rocks, andesitic feldspar porphyry, argillite, limestone, and pebble conglomerate

PALAEOZOIC

PERMIAN OR LATER
9 — Serpentinite and ultramafic rocks

PERMIAN AND (?) EARLIER
CACHE CREEK GROUP
8 — 8a, dark and light grey, finely crystalline, massive limestone; 8b, chert, argillite, and greenstone; minor limestone

MISSISSIPPIAN (?)
SLIDE MOUNTAIN GROUP
7 — Andesitic and basaltic volcanic rocks, chert, limestone, and conglomerate

CAMBRIAN AND (?) LATER
LOWER CAMBRIAN AND (?) LATER
CARIBOO GROUP (2-6)
6 — SNOWSHOE FORMATION: grey, brown, and green sericitic quartzite and pebble conglomerate; grey, brown and green phyllite; quartz-biotite schist, locally garnetiferous; includes small exposures of unit 5

5 — MIDAS FORMATION: black, quartzose phyllite, slate, argillite, and siltstone; northwest of Cariboo River includes unit 4 where that unit is thin and discontinuous

4 — YANKS PEAK 'QUARTZITE': grey to white quartzite and grey, finely crystalline limestone

3 — YANKEE BELLE FORMATION: brown and green quartzose phyllite and fine quartzite

LOWER CAMBRIAN
2 — CUNNINGHAM LIMESTONE: grey, finely crystalline, massive limestone; locally creamy white marble; minor well-bedded limestone and argillite

PROTEROZOIC (?)

KAZA GROUP
1 — Quartzite and phyllite; minor conglomerate

Small rock outcrop . . . . . ×
Geological boundary (defined, approximate) . . . . . ~~~
Bedding (inclined, vertical) . . . . . ⁄ ⁄
Schistosity and cleavage (inclined, vertical) . . . . . ⁄ ⁄
Foliation (inclined, vertical) . . . . . ⁄ ⁄
Fault (defined, approximate, assumed) . . . . . ~~~
Anticline, approximate (upright, overturned) . . . . . ⁄ — ⁄
Syncline, approximate (upright, overturned) . . . . . ⁄ — ⁄
Lightning Creek Axis . . . . . — ◇ —
Fossil locality . . . . . Ⓕ

Geology by R.B. Campbell, 1959 and 1960:
compilation as mentioned in descriptive notes

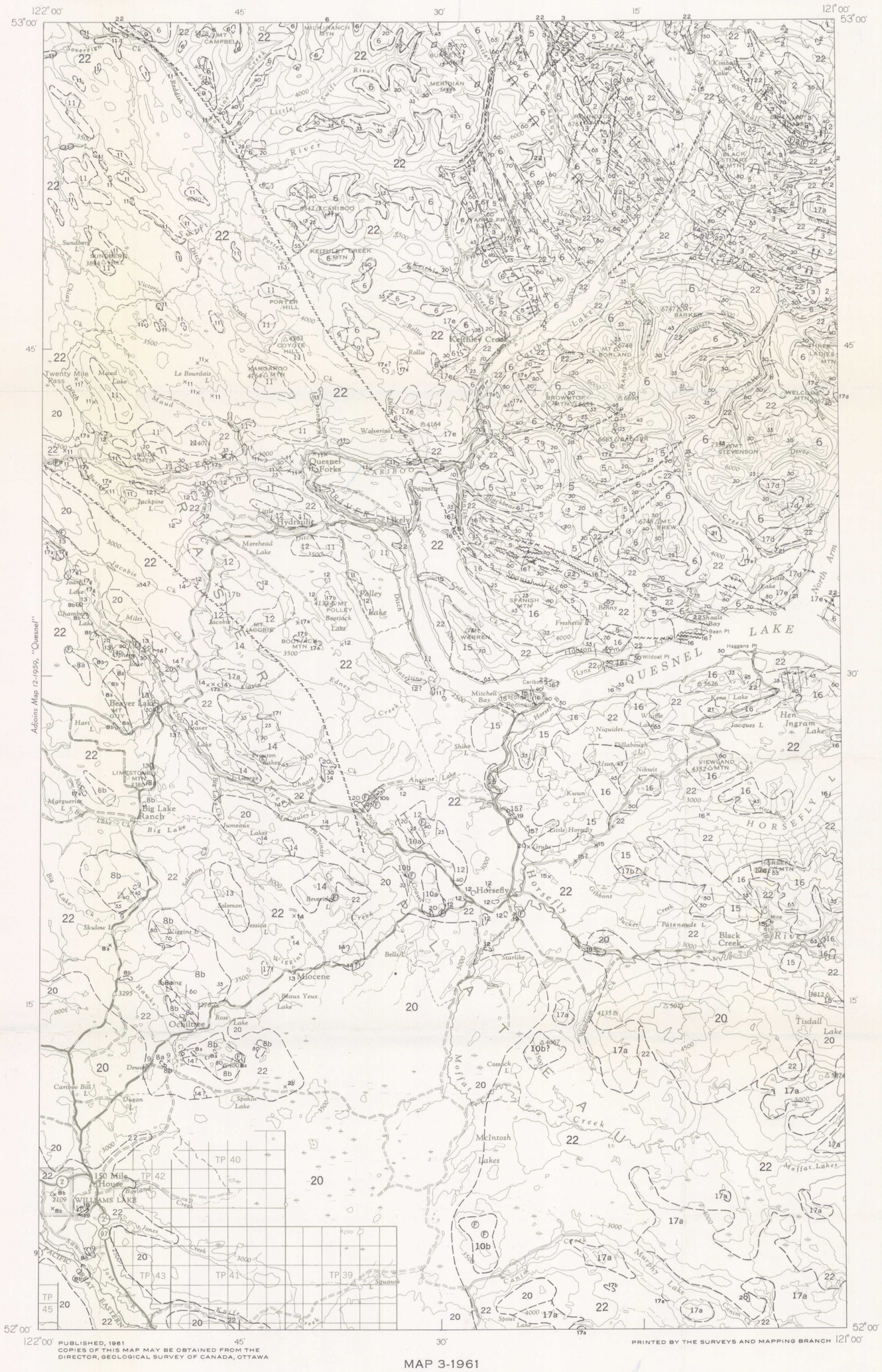
Main highway . . . . . (97)
Other roads, (all weather, dry weather) . . . . .
Trail or portage . . . . .
Railway . . . . .
Intermittent stream . . . . .
Marsh . . . . .
Contours (interval 500 feet) 5000
Height in feet above mean sea-level 3894

Cartography by the Geological Survey of Canada, 1961

Approximate magnetic declination, 25° 14' East

Base-map prepared by Surveys and Mapping Branch, 1959
with revisions by the Geological Survey of Canada, 1961

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



PUBLISHED, 1961
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MAP 3-1961
(REVISION OF MAP 59-1959)

GEOLOGY

QUESNEL LAKE
(WEST HALF)
BRITISH COLUMBIA

Scale: One Inch to Four Miles = 1 / 253,440
Miles
4 2 0 4 8 12

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

Much previous geological work has been done in the north half of the area. Of particular use to the writer was the mapping by Holland[1] and Sutherland Brown[2], whose results are shown without modification except as demanded by the change in scale. Sutherland Brown kindly made available the as yet unpublished result of his mapping in the area east of Roundtop Mountain and north of Little River, and this is shown essentially as mapped by him. The work of Cockfield and Walker[3] and C.H. Crickmay (unpublished map of the Spanish Lake area, 52°30' to 52°45'N lat. and 121°15' to 121°30'W long.) provided much valuable information; the geology is shown with modifications resulting from the writer's own work.

The Kaza group (1) rocks within the area are at the top of a thick and extensive sequence of clastic sedimentary rocks that form a wide belt beyond the area to the northeast. These beds lie conformably beneath the Cunningham limestone (2). The rocks of the Cariboo group (2-6) form an essentially conformable succession in which the individual formations are quite distinct. The Cunningham limestone is the only thick massive carbonate member and forms prominent exposures in contrast to the fissile rocks of the Yankee Belle formation (3). The Yanks Peak 'quartzite' (4) outcrops boldly where present and, together with the marked change in colour from the Yankee Belle formation (3) to the Midas formation (5), provides a good marker horizon. The Snowshoe formation (6) contains some rocks resembling those of the Yankee Belle formation, but most such rocks are associated with the more characteristic sericitic quartzite.

The grade of metamorphism in the Cariboo group increases to the southeast. In a band extending northerly from Shoals Bay to Little River, rocks of the Snowshoe formation are quartz-biotite-garnet schist associated with dykes and sills of muscovite granite and pegmatite (17d), many of which are too small to show on the map. Immediately north of Three Ladies Mountain the Cunningham limestone is recrystallized to creamy-white marble.

Rocks of the Slide Mountain group (7) are poorly exposed and of limited extent in the area and the writer has little first-hand knowledge of them. It is known from exposures to the north that these rocks rest unconformably on the Cariboo group; probable Mississippian fossils were found in them.

Fossils collected from the Cache Creek group (8) are of definite Permian age, and in the Prince George area to the northwest only Permian fossils have been found in rocks of this group. Exposure of Cache Creek group rocks is limited and the stratigraphic succession is not known.

Serpentinite and ultramafic rocks (9) have been found to intrude only Cariboo and Cache Creek group rocks and apparently do not intrude Mesozoic strata.

The Mesozoic and Tertiary rocks and the Quaternary unconsolidated deposits are discussed in more detail in previous descriptive notes[4]; information on only some of the units is given here.

The top of the Upper Triassic succession (10) is conglomerate (10a) in which the pebbles and cobbles are all composed of volcanic rocks. These volcanic fragments are green in the lower beds and purple in the upper beds. The contact of the conglomerate and the 'purple' volcanic rocks (12) seems to be conformable and gradational.

The rocks of unit 11 are not subdivided, partly because of the extremely poor exposures and partly because of the lack of fossils and distinctive lithological units. Volcanic rocks predominate, but conglomerate and other sediments occur in a northwesterly trending band passing just south of Quesnel Forks, and black argillite lies along the contact with the Cariboo group north of Swift River. Unit 11 presumably includes equivalents of some or all of the other Mesozoic volcanic and sedimentary units.

The strata of unit 13 rest unconformably on the Cache Creek group and contain pebbles and cobbles of all the rock types in the underlying strata and locally of granitic rocks as well.

The volcanic rocks of units 14 and 15 may be parts of a single unit. Both are characterized by massive, green agglomerate and breccia which yield little structural data even where well exposed. Laminated tuff is characteristic of unit 16. This unit seems to lie conformably above the volcanic rocks of unit 15 but was not observed in association with unit 14. The relationship of unit 15 to the 'purple' volcanic rocks (12) is not known.

All the plutonic rocks of units 17a to 17d are tentatively assumed to be of the same age, and because some bodies are intrusive into Lower Jurassic rocks they are assigned to the middle or late Mesozoic, as are similar rocks in adjacent parts of British Columbia. Some of the rocks in unit 17e and some small unmapped bodies of basic rocks on and southeast of Cariboo Mountain appear to have been affected by the initial metamorphism of the Cariboo group, and thus are apparently of Palaeozoic age.

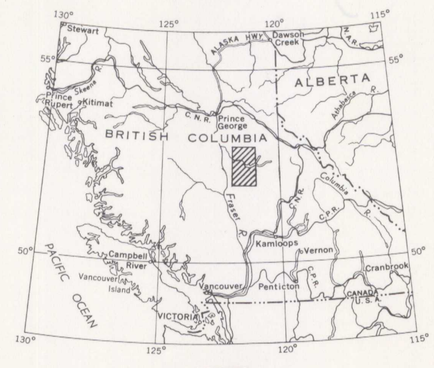
Flat-lying basaltic flows (20) are exposed in many small scattered outcrops that are not shown individually on the map. Instead the total probable extent of the flows is shown as nearly as it can be estimated.

The basaltic breccia and tuff of unit 21 commonly exhibits coarse bedding. The deposit 3 miles east of Mount Brew is in a nearly perfect volcanic cone and could be post-glacial. The deposit south of Keno Lake is in a cone much modified by glacial erosion and is interglacial or preglacial in age. The rocks along Grain Creek and on the shore of Quesnel Lake are not directly related to any obvious volcanic topographic form.

The structure in the area is characterized by the northwesterly trends of the folds and major faults. Cariboo group rocks are intensely deformed and many folds in them are isoclinal and overturned. The direction of dip of the axial planes of the folds changes across the Lightning Creek structural axis. Little is known of the details of the folding of the Cache Creek and Mesozoic rocks but the former seem to be more intensely deformed. Northwesterly trending faults, one of which brings the Mesozoic rocks against the Cariboo group, apparently are part of the Pinchi fault system which extends for many miles to the northwest.

At present there is little mining activity in the area but much placer gold was once recovered from Antler, Cunningham, and Keithley Creeks, and placers were worked along the main streams and tributaries of Quesnel, Cariboo, Swift, and Horsefly Rivers. Bedrock mining has been largely restricted to the development of gold-quartz veins mainly on Yanks Peak and on Roundtop and Cariboo Mountains. No significant base-metal discoveries have been reported. Short cross-fibre asbestos occurs in some of the serpentinite bodies. Large crystals of feldspar and books of white mica in small quantities were observed in some of the pegmatites on Mount Stevenson.

[1] Holland, S.S.: Geology of the Yanks Peak - Roundtop Mountain Area, Cariboo District, British Columbia; B.C. Dept. Mines, Bull. 34 (1954).
[2] Sutherland Brown, A.: Geology of the Antler Creek Area, Cariboo District, British Columbia; B.C. Dept. Mines, Bull. 38 (1957).
[3] Cockfield, W.E., and Walker, J.F.: Geology and Placer Deposits of Quesnel Forks Area, Cariboo District, British Columbia; Geol. Surv., Canada, Sum. Rept. 1932, pt. A1, pp. 76-143.
[4] Campbell, R.B.: Quesnel Lake, West Half, Cariboo District, British Columbia; Geol. Surv., Canada, Map 59-1959.



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MAP 3-1961
QUESNEL LAKE
BRITISH COLUMBIA
SHEET 93A (West Half)