GEOLOGICAL SURVEY OF CANADA
DEPARTMENT OF MINES AND TECHNICAL SURVEYS

PRELIMINARY SERIES

SHEET 93 A (East Half)

LEGEND

CENOZOIC

QUATERNARY
PLEISTOCENE AND RECENT

13 — Glacial deposits and recent alluvium; till, gravel, sand, silt, clay; few if any bedrock exposures

TERTIARY AND/OR QUATERNARY
PLEISTOCENE AND EARLIER

12 — Basaltic breccia, tuff, and flows; gravel

TERTIARY
MIOCENE AND/OR LATER

11 — Basaltic flows; minor tuff, breccia, and conglomerate

MESOZOIC

JURASSIC AND/OR CRETACEOUS AND (?) EARLIER

10 — 10a, hornblende-biotite and biotite quartz monzonite and granodiorite, minor hornblende-biotite syenite and monzonite, and hornblende diorite; 10b, hornblende diorite; 10c, muscovite granite and quartz monzonite, including pegmatite; 10d, gneissose biotite granodiorite with pegmatite and inclusions of unit 7

9 — Green andesitic tuff, agglomerate, breccia, and flows; argillite, greywacke, and chert; minor conglomerate and limestone

PALAEOZOIC

CAMBRIAN OR LATER
LOWER CAMBRIAN OR LATER
CARIBOO GROUP (3 to 8)

7 8 — SNOWSHOE FORMATION: 7. Brown and grey quartzite and quartz-mica schist, commonly garnetiferous, local quartz-mica-staurolite and kyanite schist; quartz-feldspar-mica gneiss; thin-bedded limestone, amphibolite; minor chlorite schist; includes many small pegmatite bodies
8. Massive, grey-weathering, creamy-white marble

6 — MIDAS FORMATION: black argillite, siltstone, and quartzose phyllite

5 — YANKS PEAK QUARTZITE: grey, white, and tan quartzite

4 — YANKEE BELLE FORMATION: 4a, mainly thin-bedded, green, slaty shale and siltstone; minor brown and purple shale, brown quartzite, and limestone; 4b, green phyllite

CAMBRIAN
LOWER CAMBRIAN

3 — CUNNINGHAM LIMESTONE: thin-bedded, brown-weathering, dark grey limestone and grey-weathering, massive, grey limestone; minor shale and argillite

PROTEROZOIC (?)

LOWER CAMBRIAN OR EARLIER

2 — Dark to medium grey, thin-bedded, slaty shale interbedded with limy shale and limestone near top of section; brown and grey quartz-granule and pebble conglomerate near bottom

KAZA GROUP

1 — Thick-bedded, grey and brown-weathering, green, micaceous, feldspathic quartzite and granule conglomerate and silvery green mica-chlorite schist and phyllite

Small rock outcrop ×
Geological boundary (defined, approximate or assumed)
Limit of geological mapping
Bedding, tops known (horizontal, inclined, vertical)
Bedding, tops not known (inclined, vertical)
Schistosity (inclined, vertical)
Foliation (inclined, vertical)
Fault (approximate, assumed)
Anticline, approximate (upright, overturned)
Syncline, approximate (upright, overturned)
Mineral prospect (molybdenum, Mo) Mo ×

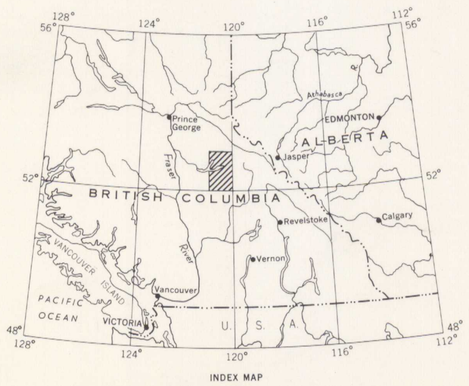
Geology by R. B. Campbell, 1961

Cartography by the Geological Survey of Canada, 1962

Mean magnetic declination, 24° 59 East, decreasing 3.5' annually. Readings vary from 24° 38' E in the SE corner to 25° 35' E in the NW corner of the map area

Roads, loose surface, all weather
Roads, loose surface, dry weather
Trail
District boundary
Building or cabin
Horizontal control point
Intermittent stream
Rapids R
Glacier Gl
Contours (interval 500 feet) 4000
Height in feet above mean sea-level 4352

Base-map by the Surveys and Mapping Branch, 1959
Revisions to roads by the Geological Survey of Canada, 1962



INDEX MAP

PUBLISHED, 1962
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PRINTED BY THE SURVEYS AND MAPPING BRANCH

MAP 42-1961
GEOLOGY
QUESNEL LAKE
(EAST HALF)
BRITISH COLUMBIA

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

DESCRIPTIVE NOTES

Roads provide access to the southwestern and southeastern parts of the area; the remainder is accessible only from the large lakes of the Quesnel and Clearwater systems. Below an elevation of about 6,200 feet the valleys are covered with heavy timber and thick underbrush; foot travel here is slow and arduous.

Nearly 4,500 feet of almost-flat lying strata of the Kaza Group (1) is exposed along the north side of Mitchell Lake valley and it has been estimated by Sutherland Brown, British Columbia Dept. of Mines (personal communication) that the thickness of the group is in excess of 12,000 feet. The thick bedding is very prominent and gives the exposures a characteristic blocky appearance.

The contacts of map-unit 2 are gradational; their position on the map is arbitrary and may be changed as a result of further work. The contacts have been determined, as well as possible, by including within the unit all beds in which grey, slaty shale is prevalent, even though associated beds may resemble those of the Kaza Group or the Cunningham Limestone. Bedding and cleavage commonly intersect at a large angle and the cleavage surfaces may exhibit a characteristic striped pattern. This unit, named the Isaac Formation by Sutherland Brown (report in preparation), is estimated to be about 2,000 feet thick.

In the eastern part of the map-area near Hobson Lake and in areas farther west, the Cunningham Limestone (3) is massive and grey-weathering. East and southeast of Mitchell Lake the limestone is prominently bedded and weathers in shades of brown. This difference apparently reflects a difference in the intensity of deformation; in the first two areas the strata are highly folded and in the latter area they are nearly flat lying or are folded only locally. The limestone is thought to be more than 3,000 feet thick. On the southeast slope of the mountain 5 miles east of Mitchell Lake 2,800 feet of beds are exposed below the Yankee Belle Formation (4), and all are believed to be part of the Cunningham Limestone.

The shaly rocks of the Yankee Belle Formation (4) become more slaty southeastward from the area of flat-lying strata east of Mitchell Lake, and they are phyllites both in the unmapped region east of Hobson Lake and in the western part of the map-area. About 10 miles southeast of Mitchell Lake the thickness of the formation was roughly measured as 2,000 feet.

Quartzite beds in the Yankee Belle Formation become more numerous toward the top of the section and the beginning of the Yanks Peak Quartzite (5) cannot be precisely determined. Distinct beds in the quartzite are from 1 foot to 2 feet thick and there is some crossbedding. The rock is essentially pure quartz except for little rusty specks which are believed to be grains of ankerite. The Yanks Peak Quartzite is approximately 650 feet thick in exposures 10 miles southeast of Mitchell Lake.

In the eastern part of the area the Midas Formation (6) is composed of platy, hard, sooty-black argillite and siltstone, and in the western part, south of Quesnel Lake, it is black quartzose phyllite or quartz-sericite schist. In the latter area the rocks are correlated mainly on lithological grounds and with some uncertainty. The thickness of the Midas Formation is not known but in the west it is thought to be more than 1,000 feet.

Metamorphism of the Snowshoe Formation (7,8) reaches the highest grade in the area between Mount Watt and Niagara Peak. Deformation in the metamorphic rocks is intense, bedding and cleavage are generally parallel, and isoclinal drag-folds, some of which are recumbent, are common. The large mass of carbonate (8), which extends from Maeford Lake to Mount Watt, is believed to continue to the southeast as the thin marble member (shown mainly as a heavy black line). The thickening involved, from less than 50 feet to more than 500 feet, is thought to be due to extensive repetition by nearly recumbent isoclinal folding and by abrupt sedimentary thickening. The thickness of the Snowshoe Formation is not known but it is believed to be more than 1,000 feet and possibly is many thousands of feet.

Within the map-area the sequence of rocks beginning with the Kaza Group (1) and extending up to the Yanks Peak Quartzite (5) is an apparently conformable succession that is more than 12,000 feet thick, and if the Kaza Group is as thick as suspected, the total thickness may exceed 20,000 feet. To this may be added the as yet unknown total thickness of the Midas and Snowshoe Formations, which may be many thousands of feet.

The rocks of map-unit 9 are dominantly volcanic. Moreover, the sedimentary rocks of the unit show the influence of a volcanic environment; much of the material in them is of volcanic origin and all gradations from fragmental volcanic to sedimentary rocks occur. Tuffaceous rocks, which commonly contain fragments or whole crystals of black pyroxene, are characteristic of the unit though they may not be dominant in any one group of exposures. In a previous work the writer [1] tentatively indicated that rocks equivalent to those of map-unit 9 are younger than Lower Jurassic, but the evidence for this is not strong, and it may be that the rocks are older than Lower Jurassic.

The contacts of the granitic batholith in the southwestern part of the area are generally not exposed, but east of Buster Lake the volcanic rocks (unit 9) are recrystallized and intruded by diorite dykes for a distance of over a mile from the contact. Other granitic bodies have little or no obvious contact effect on the surrounding rocks.

On the west margin of the area, on the northwest side of Quesnel Lake, about 40 feet of basalt flows of map-unit 12 overlies 250 feet of well-bedded gravel. These flows merge with fragmental basaltic material that is exposed along the lakeshore. Glacial erosion appears to have affected all the basaltic deposits of unit 12, hence they can be no younger than Pleistocene, and some or all may be pre-Pleistocene.

Many folds in highly deformed strata of the Kaza Group and map-unit 2 in the northeastern part of the area are overturned toward the southwest. Reverse faults that cross the Clearwater River about 10 miles above Hobson Lake separate this deformed zone from a block to the southwest that is characterized by large areas of nearly flat lying strata, though locally there is rather intense folding, particularly near the head of Hobson Lake. The southwest margin of this block is marked by a fault that extends southeasterly from Matthew River valley. Displacement on the latter fault may be large and is believed to be mainly right-hand strike-slip. Folds in the Kaza Group adjacent to this fault have steeply southwest dipping axial planes. In the Cariboo Group southwest of the fault, many folds are isoclinal and are strongly overturned to the southwest.

Little is known of the structure in the rocks of map-unit 9.

An important molybdenum deposit on the east slope of Takomkane Mountain is currently under development. The sulphide mineralization—almost exclusively molybdenite—occurs in a brecciated zone in granitic rocks. To date no other significant mineral deposits are known in the area, but there are reports of lead mineralization in the Cunningham Limestone near the north end of Hobson Lake. Although nothing of apparent commercial value was observed in the many pegmatite bodies associated with the Snowshoe Formation, these might be worth prospecting.

[1] Campbell, R. B.: Quesnel Lake, West Half, British Columbia; Geol. Surv., Canada, Map 3-1961.

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MAP 42-1961
QUESNEL LAKE
BRITISH COLUMBIA
SHEET 93 A (East Half)

5.1.7 B.C. Quesnel Lake.
A. Geol. Scale - 4 mi. to 1" 1962. Map no. 42-1961. Copy 2.