GEOLOGICAL SURVEY OF CANADA
DEPARTMENT OF MINES AND TECHNICAL SURVEYS

PRELIMINARY SERIES

SHEET 104 K

LEGEND

CENOZOIC

QUATERNARY
PLEISTOCENE AND RECENT

- **14** Fluviatile gravel, sand, and silt; glacial outwash; till and alpine moraine

TERTIARY AND QUATERNARY
PLIOCENE (?) AND PLEISTOCENE

- **13** Basalt, olivine basalt, and related pyroclastic rocks; in part younger than some of 14
- **12** Rusty weathering rhyolitic flows and related intrusions

TERTIARY
EOCENE (?)

- **11** Light green, purple, and white rhyolite and dacite flows, breccia, and tuff; minor tuffaceous sandstone with coaly material
- **10** Felsite; mainly porphyritic rhyolite

MESOZOIC

JURASSIC
LOWER JURASSIC

- **9** Granite-boulder conglomerate, chert-pebble conglomerate, greywacke, quartzose sandstone, siltstone, and shale
- **8** Well bedded greywacke, graded siltstone and silty sandstone, pebbly mudstone and limestone-boulder conglomerate

TRIASSIC AND/OR JURASSIC
UPPER TRIASSIC AND/OR LOWER JURASSIC

- **7** Pillow basalt, volcanic breccia and agglomerate, lapilli tuff; minor volcanic sandstone and siltstone

TRIASSIC AND LATER
COAST INTRUSIONS

- **6** Undifferentiated granitic rocks, mainly granodiorite; 6a, quartz monzonite; 6b, diorite and meta-diorite

TRIASSIC
UPPER TRIASSIC

- **5** SINWA FORMATION: chiefly limestone; minor sandstone and argillite
- **4** Thick-bedded, dark-coloured greywacke and mudstone; minor silty shale and green siltstone

TRIASSIC AND EARLIER

- **3** Fine-grained clastic sediments and intercalated volcanic rocks, largely altered to greenstone and phyllite; 3a, amphibolite; 3b, quartz-albite-amphibole gneiss, quartz-biotite schist, and migmatite

PALAEOZOIC

PERMIAN

- **2** Chiefly limestone; minor chert, argillite, and sandstone

PENNSYLVANIAN OR PERMIAN

- **1** Peridotite, largely layered; minor bodies of meta-diorite; 1a, serpentinized; 1b, carbonatized

Geological boundary (defined, approximate, assumed)
Limit of geological mapping
Bedding (horizontal, inclined, vertical, overturned)
Bedding (direction of dip known, upper side of bed unknown)
Anticline
Syncline
Trend of complexly folded beds
Lineament (from air photographs)
Major dyke swarm
Zone of hydrothermal alteration and pyritization
Fault (defined, approximate, assumed)
Thrust fault (defined, assumed)
Fossil locality

Geology by J.G. Souther, 1959

Geology north of Inklin River modified after J.D. Aitken, 1955

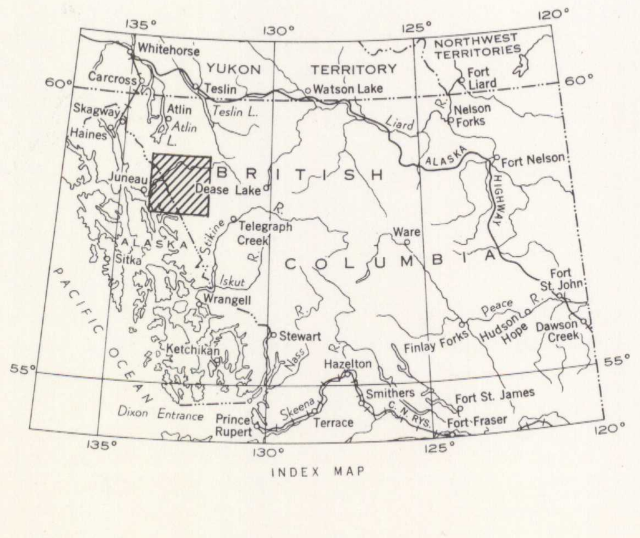
Trail
Glacier (Gl)
Contours (interval 1,000 feet) (5000)
Height in feet above mean sea-level (4379)

Cartography by the Geological Survey of Canada, 1960

Approximate magnetic declination, 29° 58' East

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



INDEX MAP

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6-1960

MAP 6-1960
GEOLOGY
TULSEQUAH
CASSIAR DISTRICT
BRITISH COLUMBIA

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

Miles
4 2 0 4 8 12

DESCRIPTIVE NOTES

The northern half of the mapped area lies in the Taku Plateau, a deeply incised area of nearly flat summits mostly below 5,000 feet in elevation. The general plateau character is broken only by the Menatatuline Range, a mountainous belt with many points over 6,000 feet above sea-level. South of the plateau the topography changes abruptly to the rugged terrain of the Coast Mountains with sharp serrated ridges, steep-walled cirques, and many peaks over 8,000 feet above sea-level.

The old Telegraph Trail, which crosses the north-eastern corner of the map-area, is the only travelled route in the region. Inklin and Sheslay rivers are navigable with small, shallow-draft boats, and many lakes within the area provide suitable landing sites for float-equipped aircraft.

Coarse topographic grooves, formed during Pleistocene glaciation, trend southwesterly on the higher peaks of the Menatatuline Range, whereas grooves at lower elevations trend westerly. Evidence of Pleistocene ice-movement in the Coast Mountains has been largely obscured by later alpine glaciers, many of which still occupy the higher cirques and valleys.

The pre-Upper Triassic sedimentary and volcanic rocks (2, 3) have been intensely folded and regionally metamorphosed to phyllite, greenstone, and crystalline limestone. Only the limestone (2), which contains Upper Permian fusulinids and corals, has been accurately dated. About 2,000 feet of limestone beds are exposed southwest of Tatsamenie Lake and parts of the same section appear in the crests of anticlines farther east. Overlying the limestone (2) with apparent conformity is a thick succession of thin-bedded, fine-grained, clastic sedimentary and volcanic rocks (3). These are correlative with lithologically similar beds in Chutine map-area (GSC P.S. Map 7-1959) that contain Middle(?) Triassic fossils. Unit 3 may also include some rocks that are older than the limestone (2). Locally the sedimentary rocks (3) have been metamorphosed to coarse-grained amphibolite (3a) and high-grade schist and gneiss (3b).

Southeast of Trapper Lake the trend of folds in phyllitic pre-Upper Triassic rocks (2, 3) is consistently north-south, in marked contrast to the westerly and northwesterly trend of relatively open folds in unmetamorphosed Upper Triassic strata. Although not exposed, a major unconformity is thus indicated at the base of the Upper Triassic section.

The lower division (4) of the Upper Triassic section consists of dark green, grey, and brown volcanic sandstone, greywacke, siltstone, and shale, and contains abundant fossils of Karnian (middle Upper Triassic) age. These beds are overlain conformably by the Sinwa formation (5), a brown, fetid, white-weathering limestone containing minor lenses of sandstone and argillite. The Sinwa formation, previously mapped by Kerr (GSC Memoir 248) as Jurassic(?), contains in this area, an abundant and well-preserved Norian (late Upper Triassic) fauna.

The Upper Triassic rocks (4, 5) have been thrust toward the southwest and override Lower Jurassic strata along a major east-west-trending thrust fault. For most of its mapped length the thrust plane follows the base of the Sinwa limestone but, toward the west, cuts down into Karnian beds (4). The amount of movement is unknown, but a small patch of limestone resting on Lower Jurassic shale and sandstone (9) east of Trapper Lake is believed to be a klippe of Sinwa formation, suggesting a minimum displacement of 10 miles. Furthermore, Jurassic strata (9) below the thrust and unit 8 above the Sinwa limestone belong to distinctly different facies, presumably deposited in widely separated areas.

South of the thrust fault the Triassic-Jurassic rocks are divided into two lithologically distinct units. The lower unit (7) is mainly volcanic and does not contain diagnostic fossils. It may be Lower Jurassic or it may be Upper Triassic and equivalent to the Karnian beds (4) on the north side of the thrust. If it is Upper Triassic then the Sinwa limestone was not deposited south of the present position of the thrust fault as there is no limestone member between the volcanic rocks (7) and the overlying Lower Jurassic sedimentary rocks (9). The latter contain an abundant Pleinsbachian and Toarcian (upper Lower Jurassic) fauna. In the eastern part of the map-area unit 9 is mainly thick-bedded greywacke, interbedded with shale and minor beds of pebble-conglomerate. The amount of conglomerate increases toward the west and, near King Salmon Lake, granite-boulder conglomerate forms a major part of the Toarcian section.

North of the thrust fault and resting with structural conformity on the Sinwa limestone is a monotonous succession of greywacke and graded siltstone (8). The lower part of this section contains many beds of limestone-boulder conglomerate derived from the Sinwa formation (5). No diagnostic fossils have been found in these rocks (8), but the presence of abundant plant debris and occasional seams of coal suggest a Jurassic rather than a Triassic age. North of the Sinwa limestone (5) the same succession of beds (8) is repeated by northwesterly trending folds within a broad synclinorium. This structure is bounded on the north by a steeply dipping fault that forms the southern contact of the Nahlin ultramafic body(1).

Gently folded rhyolitic volcanic rocks and derived sedimentary rocks (11) rest unconformably on granitic (6) and sedimentary rocks (3, 7) in the southwestern part of the map-area. The presence of large coalified logs in some of the tuffaceous sandstones suggests a Tertiary age and they are tentatively correlated with lithologically similar Eocene beds of Telegraph Creek area (GSC P.S. Map 9-1957).

Near Heart Peaks, flat-lying, rusty-weathering rhyolite flows (12) are overlain discomformably by flat-lying basalt flows (13) which, though glaciated themselves, rest locally on earlier glacial deposits.

The Nahlin peridotite body forms the backbone of the Menatatuline Range and is the largest of the ultramafic intrusions (1) in the map-area; the only other occurrence is a small tabular body southeast of Tatsamenie Lake. Much of the peridotite is layered by widely spaced zones enriched in pyroxene and olivine which, though irregular in dip, have a strike that is close to that of the body as a whole. In most exposures the prevailing layering is crossed by other pyroxene-rich layers, and is interrupted by pods of dunite. The contacts of the Nahlin body are sheared, serpentinized, and locally carbonatized. Granitic rocks of the Coast Intrusions (6) consist mainly of biotite and hornblende granodiorite, and quartz diorite, the hornblendic rocks being dominant in contact phases and satellite bodies and the biotitic rocks being dominant in the large, central granitic masses. Coarse-grained quartz monzonite (6a) characterized by pink feldspar and smoky quartz is consistently the youngest major phase of the Coast Intrusions. Hornblende diorite and meta-diorite (6b) form distinct intrusive bodies as well as contact phases gradational with granodiorite and quartz diorite (6). Numerous stocks, sills, and dykes of porphyritic felsite (10) are believed to be genetically related to lithologically similar Tertiary volcanic rocks (11).

No mineral deposits of economic significance were observed in the map-area. Narrow, widely spaced veins of asbestos are developed locally in the ultramafic rocks and, along the southern contact of the Nahlin body, carbonatized serpentinite contains narrow veins of high-grade magnesite. Low-grade pockets of disseminated copper minerals are associated with the quartz monzonite body (6a) northeast of Tatsamenie Lake and with many of the Tertiary felsite stocks (10). A wide zone of hydrothermal alteration occurs along the northwest side of Tatsamenie Lake where chloritic phyllites (3) are bleached, pyritized, and cut by a boxwork of carbonate veins, some of which carry traces of copper minerals.

MAP 6-1960
TULSEQUAH
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