Vesicular olivine basalt lava

JURASSIC (?) OR LATER POST-MISSISSIPPIAN

CASSIAR INTRUSIONS (relative ages unknown) 10A. CASSIAR BATHOLITH: biotite quartz monzonite; 10A-10D aplite and pegmatite 10 B. Biotite-hornblende quartz monzonite

> 10 C. Biotite quartz monzonite, granite; in part with quartz-tourmaline miarolitic cavities 10 D. Biotite-hornblende quartz monzonite, monzonite

Peridotite, dunite, serpentinite, and altered equivalents

Diorite, granodiorite, quartz diorite

MISSISSIPPIAN AND (?) LATER

Grey and black chert, slate, argillite, phyllite, ribbon chert, conglomerate containing chert and quartzite pebbles, limestone and dolomite; hornfels, skarn; minor tuff, arkose, grit, quartzite

MISSISSIPPIAN Grey and black chert, hornfels, slate, argillite, phyllite, ribbon chert, limestone, skarn, quartzite; 6a, fossiliferous limestone and dolomite

DEVONIAN AND MISSISSIPPIAN Greenstone, chlorite schist, and quartzite; grey and black slate, argillite, phyllite, chert, ribbon chert, hornfels; greywacke, grit, and pebble conglomerate; minor albite-actinolite schist, quartzalbite-mica gneiss; 5a, limestone and dolomite

DEVONIAN MIDDLE DEVONIAN Grey and black fetid dolomite, dolomitic limestone, quartzite;

SILURIAN LOWER SILURIAN Buff siltstone and quartzite, fetid dolomite

minor black slate

CAMBRIAN (?) TO SILURIAN (?) LOWER CAMBRIAN (?) TO LOWER SILURIAN (?)

Calcareous hornfels, skarn

CAMBRIAN

LOWER CAMBRIAN

White, grey, and buff quartzite, limestone, dolomite, grey and buff slate; minor arkose, hornfels

Limestone, biotite-muscovite schist and quartzite, skarn,

chert, hornfels, greenstone, slate

MINERAL SYMBOLS Lead Pb Tungsten . . . W

Silver.... Ag Zinc.... Zn

Drift ridge or large rock groove (showing direction of ice movement). . .

> Geology by W.H. Poole, 1951, 1952, 1953, 1954 Approximate magnetic declination, 33°02 East

Cartography by the Geological Cartography Unit, 1955

130°00′ 30' 132°00′ 30′ 131°00′ 45 15 ARD 45' LOOKOUT 131° 00′ Printed by Surveys and Mapping Branch PRELIMINARY MAP 55-21

WOLF LAKE

YUKON TERRITORY

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

LEGEND

SHEET 105 B

Contours (interval 1000 feet)..... Height in feet above mean sea-level 4720

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

DESCRIPTIVE NOTES

The southern part of Wolf Lake map-area is accessible from the Alaska Highway and the northeastern part from Liard River, which is there navigable by small river boats and canoes. Pack-horses can be used in all parts of the map-area. Suitable aircraft can land on most of the lakes and the Pine Lake air strip is maintained for emergency use.

Wolf Lake map-area occupies the northern end of the rugged, northwesterly trending Cassiar Mountains. Nisutlin Plateau borders the mountains on the west and north. The northern extensions of Dease Plateau and Liard Plain border the mountains on the east and separate them from the Simpson Range of the Pelly Mountains in the northeast. The divide between the Yukon and Mackenzie River drainages follows an irregular line through the central part of the map-area.

East of Wolf Lake, rocks of unknown but probable Palæozoic age (A) are metamorphosed near the contact of the Cassiar batholith (10A) and dip away from it. Late Lower Cambrian rocks (1) are the oldest known rocks in the map-area; the base has not been recognized. Near the base of the section southeast of Rudy Lakes, arkose is interbedded with quartzite. Sections 20,000 and 13,000 feet thick appear to be present east of Tootsee River and southeast of Rudy Lakes, respectively. These sections and some others in the map-area seem excessively thick, but evidence of repetition is lacking.

East of Tootsee River, about 4,000 feet of calcareous hornfels and skarn of early Cambrian (?) to early Silurian (?) age (2) lie between Lower Cambrian (1) and Middle Devonian (4) rocks.

About 500 feet of late Lower Silurian rocks (3) appear to overlie disconformably Lower Cambrian limestone (1) southeast of Veronica Lake. About 3,200 feet of Middle Devonian rocks (4) are exposed in the southeast, where they appear to overlie disconformably Lower Silurian rocks (3). Near Hidden Lake, a thin slice of Middle Devonian dolomite and slate (4), about 1,300 feet thick, is preserved within the fault-zone along the northeast border of the Dorsey Range.

Devonian and Mississippian rocks (5) occupy parts of two faulted major synclines on each side of the Cassiar batholith (10A). In the southeast, apparently well over 8,000 feet of rocks (5) are exposed. On Hazel Ridge, these rocks are about 9,500 feet thick, although the base of the section is exposed only west of the map-area. The greenstone lying above and east of the limestone and dolomite bed (5a) apparently pinches out to the northwest in Teslin map-area. The rocks of map-unit 5 along the northeast border of the Dorsey Range are down-faulted against Lower Cambrian rocks (1), except in the fault-slice near Hidden Lake where they lie conformably on Middle Devonian rocks (4). Poorly preserved fossils collected from the limestone and dolomite bed (5a) within Wolf Lake and Teslin map-areas suggest an early or middle Mississippian

Mississippian rocks (6) in the Dorsey Range are about 14,000 feet thick west of the Pine Lake air strip and about 25,000 feet thick north of Dorsey Lake. Most of the argillaceous rocks have been metamorphosed to hornfels and hard argillite by the underlying batholith (10C). The Mississippian rocks (6) overlie conformably the greenstone-bearing assemblage (5) along most of the northeast border of the Dorsey Range, but are apparently down-faulted against the older rocks (5) along the southwest borders of the Dorsey and Englishmans Ranges. The limestone and dolomite bed (6a) near Screw Creek contains poorly preserved fossils that indicate an early or middle Mississippian age.

The youngest Palæozoic sedimentary rocks (7) in the map-area are about 5,000 feet thick. The basal part of map-unit 7 contains pebble conglomerate. Interbedded quartzite and microcline-bearing arkose and grit form the upper part of the map-unit whose top is exposed south of the map-area. A limestone and dolomite bed contains fossils suggestive of late Mississippian age.

East of the Cassiar batholith (10A), intrusive rocks are generally lacking, whereas west of the batholith the stratified rocks (1, 4, 5, 6, 7) are cut and metamorphosed by intrusive rocks (9 and 10) and many dykes and sills too small to be shown on the map. Small bodies of ultramafic rocks (8) cut Mississippian rocks (6) without apparent contact metamorphism. Dioritic rocks (9) cut Mississippian rocks (6), but were not found in contact with ultramafic rocks (8). In a few places, granitic rocks (10B, 10C, 10D) cut ultramafic rocks (8) and dioritic rocks (9). Evidence from other map-areas indicates that most of the granitic rocks (10) apparently were intruded during the Jurassic and/or Cretaceous periods. The dioritic rocks (9) were probably emplaced slightly earlier. The time of emplacement of the ultramafic rocks (8) is unknown

About 250 feet of olivine basalt lavas (11) occur in the Rancheria River Valley. The top of the basalt is marked by a relatively flat bench, but the base is everywhere concealed by drift (12). The lavas were probably erupted in the late Tertiary and /or Pleistocene

Pleistocene ice probably at one time covered the whole map-area. From interpretation of features seen in air photographs, the ice appears to have moved easterly on the east flank of the Cassiar Mountains and in the north part of the map-area, and southeasterly in the Liard Plain.

Two northwesterly trending major synclines, separated by an anti-clinal area occupied by the Cassiar batholith (10A), dominate the structure of the map-area. Moreover, an anticline lies a few miles west of Hazel Ridge and another apparently passes through Lower Cambrian quartzite and slate (1) south of the lower Rancheria River bridge. These regional structures plunge southeasterly from zero to 15 degrees and have nearly vertical axial planes. In the southeast the mechanics of faulting are not well understood. However, the rocks (2, 3, 4, 5) of the interior of a major syncline have apparently been broken by tear faults and down-faulted against Cambrian rocks (1) in most places. Along the northeast border of the Dorsey Range, post-Cambrian rocks (4, 5, 6) have been down-faulted against Lower Cambrian rocks (1). Along the southwest borders of the Dorsey and Englishmans Ranges Mississippian rocks (6) have been down-faulted against older rocks (5). Northwest and southeast of Daughney Lake, and probably along the whole of the southwest contact of the Cassiar batholith (10A) as far north as the Morley River Valley, Lower Cambrian rocks (1) are down-faulted against the

Prospecting in the map-area began in the 1870s with the discovery of placer gold on Liard River and its tributaries Rainbow, Scurvy, Sayyea, and Cabin Creeks. In subsequent years, the map-area was largely neglected, except during the 1930s with the advent of bush flying. With construction of the Alaska Highway in 1942, prospecting was renewed but was generally restricted to the country adjacent to the Highway. Several base metal properties have been found. Veins of silver-bearing galena cut Lower Cambrian dolomite (1) along the east contact of the Cassiar batholith (10A) near the Highway and similar veins cut this batholith (10A) south of the Highway. Northeast of Boulder Creek, quartz veins containing wolframite, cassiterite, and fluorite cut contorted limy phyllite. Southeast of Crescent Lake, sphalerite and pyrrhotite occur in skarn in hornfels along the borders of diorite bodies (9) and a few miles southwest of these deposits silver-bearing sphalerite and galena outcrop in the bed of a small creek. West of Logjam Creek, silver-bearing galenasphalerite-quartz veins cut hornfels along the border of a diorite body (9). Fluorite and boron minerals occur in many places along the borders of the batholith (10C) in the Dorsey Range. West of the headwaters of Partridge Creek, a tourmaline-fluorite-quartz vein cutting hornfels contains small cassiterite crystals. East of Wolf Lake, two occurrences of fluorite, one a replacement of limestone and the other a quartzfluorite vein, were noted. Asbestos veinlets not exceeding 1/8 inch in width were found in the ultramafic bodies near Logjam and Goddart

> PRELIMINARY MAP 55-21 WOLF LAKE YUKON TERRITORY

> > SHEET 105 B

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