

SECTIONS ALONG LINES A-B, C-D, E-F

PRELIMINARY SERIES SHEET 94 K

- LEGEND**
- CRETACEOUS**  
LOWER CRETACEOUS  
17 BUCKINGHORSE FORMATION: black shale
- TRIASSIC**  
MIDDLE TRIASSIC  
16 LIARD FORMATION: sandstone, siltstone, minor limestone
- LOWER AND MIDDLE TRIASSIC  
15 TOAD AND GRAYLING FORMATIONS: fine sandstone, black siltstone and shale; dark grey shale
- PERMIAN**  
14 FANTASQUE (?) FORMATION: chert
- CARBONIFEROUS**  
13 MATTON AND PROPHET FORMATIONS: dark brown sandstone, shale, minor limestone; black shale, minor siltstone and limestone
- DEVONIAN**  
UPPER AND MIDDLE DEVONIAN  
12 Black shale, chert
- MIDDLE DEVONIAN**  
11 NAHANNI FORMATION: limestone, minor chert
- MIDDLE AND LOWER (?) DEVONIAN**  
10 BEAR ROCK FORMATION: light grey dolomite, dolomite breccia
- 9 Sandstone, minor siltstone, shale
- 8 MUNCHO AND MCCONNELL FORMATIONS: grey dolomite, sandy dolomite, shale
- SILURIAN**  
7 Dark grey siliceous dolomite, sandy dolomite, sandstone, black shale
- PROTEROZOIC ?**  
6 Sandy dolomite, dolomite, quartzite
- 5 Dark brown argillite
- 4 Dark grey limestone, argillaceous limestone
- PRECAMBRIAN**  
3 Brown argillaceous dolomite, dolomite
- 2 Black siltstone, siliceous shale
- 1 Dolomite, argillaceous dolomite, quartzite

- Geological boundary (defined, assumed) . . . . .
- Bedding (horizontal, inclined, vertical overturned) . . . . .
- Thrust fault (defined, approximate; teeth in hanging wall) . . . . .
- Anticline (defined, arrow indicates plunge) . . . . .
- Syncline (defined, arrow indicates plunge) . . . . .
- Dyke (defined, approximate) . . . . .
- Geology by G. C. Taylor 1960, 1961
- Cartography by the Geological Survey of Canada
- Road (all weather) . . . . .
- Road (dry weather) . . . . .
- Telephone or telegraph line . . . . .
- Intermittent stream . . . . .
- Marsh . . . . .
- Dry river bed . . . . .
- Contours (interval 100 feet) . . . . .
- Height in feet above mean sea-level . . . . .
- Base-map by the Surveys and Mapping Branch, 1950-54
- Approximate magnetic declination, 30° 28' East, decreasing 3.9' annually



**DESCRIPTIVE NOTES**

The map-area lies 95 miles west of Fort Nelson, British Columbia; it is reached by road along the Alaska Highway, British Columbia; south from the highway giving access to the area for pack-horses.

Most of the area is within the Stone Range, a frontal range of the Rocky Mountains, the remainder is within the adjacent foothills. The mountains have been extensively sculptured by alpine glaciation and are typified by cirques, tarns, aretes, and U-shaped valleys. Cirques are best developed on northeast facing slopes. Locally, Pleistocene sediments have been sufficiently interstratified to permit the development of erosion pillars, particularly in Wokpash Creek and Summit Pass. Erratics from a formation that occurs only to the west indicate that alpine ice advanced over the crest of the northern portion of the Stone Range. No evidence for the succession of continental ice into the area was observed.

All exposed rocks are sedimentary, except for the numerous basic dykes which cut only the pre-Silurian succession.

Map units 1 to 6 unconformably underlie the Silurian carbonates and are assumed to be Precambrian. They comprise a conformable sequence of shallow water marine sediments with a minimum thickness of 6000'. Unit 1 contains the oldest rocks exposed consisting of a thick succession (2000') of pasted hard dolomites and argillaceous dolomites grading upwards to more sombre hard locally stromatolitic dolomites, and capped by a thin (200') sequence of thin-bedded, white orthoquartzites with interbedded argillaceous dolomites. Ripple-marks, mud-cracks, and intercalated mud chip conglomerates are very common. Unit 2 is a thick (700') formation of thin-bedded, very dark grey to black siltstone and siliceous shale which forms a distinctive marker zone within the Precambrian succession. Unit 3 is a thin (200') argillaceous dolomite grading sharply upwards into Unit 4, fine-grained, dark grey, thin-bedded to massive argillaceous limestone, about 500' thick overlain by about 200' of thick-bedded dark brown argillites - map-unit 5. A well developed slaty cleavage cuts the argillite and is the only evidence of regional metamorphism. Unit 6 is a thick (200') succession of argillaceous dolomites, dolomitic sandstone, with interbedded, thick (50'), ortho-quartzite members. Map-units 1 to 6 all weather a distinctive dark orange color, and are cut by many persistent basic dykes which readily distinguishes them from the overlying rocks.

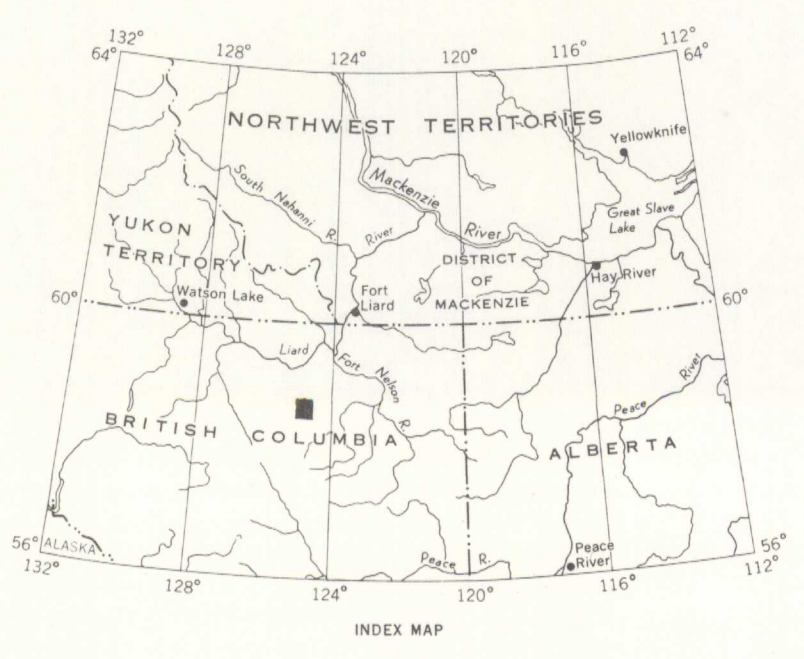
About 300' of predominantly carbonate rocks (units 7-11) overlie the Precambrian succession. Unit 7 is 650' thick and contains the Silurian (Clinton) coral fauna. The lower beds have intercalated orthoquartzites overlain by argillaceous siliceous dolomites. Unconformably overlying the Silurian beds is a thin sequence (285-300') of alternating light and dark grey dolomites (unit 8) of uncertain age correlated with the Muncho and McConnell Formations. If this correlation is correct they are probably part Lower Devonian. Unit 9 is a thin, 175-250' succession of quartzose sandstone that weathers light brown and is a valuable marker within the dominantly grey weathering carbonate succession. Unit 10 unconformably overlies the sandstones with local angular discordance. It consists of 135' of dolomites with several distinctive breccia zones of uncertain origin. Three dark argillaceous beds of dolomite with the formation serve as valuable marker beds, the beds of which occur 60' above the base. On stratigraphic position and distinctive lithology map-unit 10 has been correlated with the Bear Rock Formation of probable Middle Devonian age. The Nahanni Formation (unit 11) 935' thick conformably overlies the Bear Rock Formation and has a good Middle Devonian fauna at the top.

Overlying the carbonates is a thick succession of elastic ranging in age from Middle Devonian to Cretaceous. Unit 12 is a thick, (1630') succession of black shales and siliceous mudstones conformable on the Nahanni limestones, the contact being gradual through an interval of 5 feet. The beds are therefore of Middle and probably Upper Devonian. Map-unit 13 is a thick (1010') succession of black carbonaceous shales and interbedded fine-grained calcareous sandstones with a 70' chert unit at the base. The sandstones are more persistent in the upper part of the succession and become more massive in the northern part of the area. A small fauna collected 608' above the base has been identified as of probable Pennsylvanian age. Poorly preserved ammonites just above this suggest a Chesterian age. Age and stratigraphic position suggest a correlation with the Matton Formation for at least the upper part of the unit, the chert thus becomes a probable equivalent of the Prophet Formation. Unit 14 is composed of chert, 70-150' thick of Middle Permian age and is probably correlative with the Fantasque Formation. Unconformably overlying the chert are the Grayling and Toad Formations of Lower and Middle Triassic age (15) but lack of exposure does not permit recognition as separate formations Liard Formation (16) attains a thickness of 550' in the westernmost exposures of the foothills belt. Unit 17 was seen in only one exposure and is correlated on lithology and stratigraphic position to the Cretaceous Buckingham Formation.

Two structural provinces are represented. Unlike the southern Rockies, the distinction between Foothill and Mountain structures is not distinct. No great frontal thrust separated the two provinces. The boundary boundary coincides well with the change from the predominantly folded nature of the foothills to the predominantly faulted nature of the mountains.

The Foothills Province is characterized by a system of north-westerly trending echelon folds, typified by tight anticlinal culminations and broad, flat synclines. This on echelon arrangement of fold axis produces a more northerly trend of the deformed belt as a whole in contrast to the trend of individual folds. The superposition of minor folds with wavelengths of less than a mile, tends to mask the larger folds with wavelengths in the order of eight to ten miles. Within this portion of the Foothills, faults are of minor importance. Where present, as in the cores of tightly compressed folds, movement has taken place on steeply west-dipping reverse faults. The Mountain Front is formed by an echelon series of large asymmetric anticlines, whose east flanks have been locally overridden along small thrust faults - as in the north; or whose east flanks have ridden up out of the adjacent syncline along thrusts - as in the south; subparallel, low angle, southwest dipping thrust faults. The amount of displacement and stratigraphic throw is greater on the more westerly faults. These too, show an echelon arrangement, and consequently, where one fault decreases in displacement, a corresponding increase is commonly observed on an adjacent fault. Many of the faults root in a décollement zone of thin black shale, low in the Silurian succession (unit 7). Over a relatively short distance, these faults attain their maximum stratigraphic throw. Where the fault cuts upward stratigraphically, the beds of footwall are severely downfolded so that the dip of the fault plane itself remains relatively constant. Throughout most of their observed extent the fault planes maintain a near parallel attitude with the bedding in the hanging wall rocks. With a single exception, these thrusts are confined to the Paleozoic carbonates and younger rocks within the map-area.

Numerous showings of barite and fluorite mineralization occur throughout the area. The deposits tend to be limited stratigraphically to the interval between the lower part of the Nahanni and the upper half of the Bear Rock Formations. A small deposit of barite is located near mile 397 along the Alaska Highway. Minor showings of copper mineralization are associated with the dykes cutting the pre-Silurian succession.



MAP 28-1963  
GEOLOGY  
MACDONALD CREEK  
BRITISH COLUMBIA

Scale: One Inch to One Mile =  $\frac{1}{63,360}$  Miles

1 1/2 0 1 2 3

Library  
Geological Survey of Canada

NOV 22 1963

MAP 28-1963  
MACDONALD CREEK  
BRITISH COLUMBIA  
SHEET 94 K