CANADA

DEPARTMENT OF MINES AND RESOURCES

MINES AND GEOLOGY BRANCH

BUREAU OF GEOLOGY AND TOPOGRAPHY

GEOLOGICAL SURVEY

CASSIAR DISTRICT

COAST DISTRICT, RANGE 5

LEGEND

CENOZOIC

TERTIARY

POST-EOCENE

15 — *Mainly vesicular and amygdaloidal basalt, andesite, and dacite; flow breccia and agglomerate;* **15a**, *conglomerate*

EOCENE OR OLIGOCENE

14 — *Chiefly porphyritic and non-porphyritic rhyolite and related tuffs; related intrusive rocks; basalt, andesite, and dacite*

13 — *Conglomerate, sandstone, and shale; minor tuff*

CRETACEOUS OR TERTIARY

UPPER CRETACEOUS OR YOUNGER

11 — *Porphyritic andesite, trachyte, and rhyolite; intercalated arkose and conglomerate*

MESOZOIC

JURASSIC AND (?) CRETACEOUS

9 | 10 — **9**, *mainly porphyritic and non-porphyritic andesite and andesite breccia; basalt and rhyolite;* **10**, *andesite, trachyte, basalt, related breccias*

12 — *Rhyolite, andesite, basalt, dacite; minor related tuffs and breccias*

MESOZOIC (MAINLY OR ENTIRELY)

8a | 8b — **8a**, *grey granodiorite and quartz diorite;* **8b**, *white soda granite*

7a | 7b — **7a**, *white muscovite granite;* **7b**, *chiefly pink granite*

6 — *Brown porphyritic soda syenite*

5a | 5b — **5a**, *augite diorite;* **5b**, *foliated hornblende diorite*

4 — *Amphibolite, peridotite, serpentine; minor greenstones and sedimentary rocks (may be in part 1 and 2);* **4a**, *chiefly serpentinized peridotite and dunite; alteration products;* **4b**, *serpentinized pyroxenite;* **4c**, *gabbro*

PALAEOZOIC

CARBONIFEROUS OR PERMIAN

3 — *Massive limestone; minor argillite, chert, and andesite (greenstone)*

2 — *Andesite (greenstone); minor argillite, chert, and limestone;* **2a**, *mainly hornblende and chlorite schists*

1 — *Grey chert, argillite, and slate; minor andesite (greenstone) and limestone;* **1a**, *metamorphosed sedimentary rocks*

Heavily drift-covered area

Bedding (inclined, vertical, horizontal)

Fossil locality — (F)

Mineral occurrence — ×

Provincial highway — C

Road well travelled

Road not well travelled

Bush road or trail

School

Post Office

Geodetic Triangulation Station

Land District boundary

Forest Reserve boundary

Indian Reserve boundary

Range line

Lake and stream (position approximate)

Contours (interval 500 feet) — 2500

Contours (position approximate) — 2500

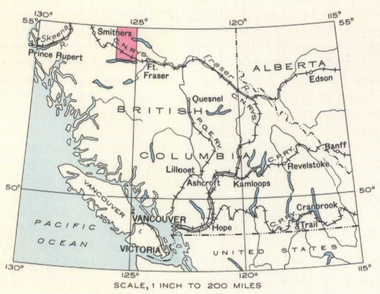
Height in feet above Mean sea-level — 2260′

Geology by J. E. Armstrong, 1936, and 1937.

Base-map from surveys and topography by the Topographical Survey, 1935, and from information supplied by the British Columbia Department of Lands. Cartography by the Drafting and Reproducing Division, 1941.

MINERAL OCCURRENCES

Silver-lead-zinc .... **Ag-Pb-Zn**
Gold .... **Au**
Copper .... **Cu**
Molybdenum .... **Mo**



SCALE, 1 INCH TO 200 MILES

DESCRIPTIVE NOTES

Above timberline, much of the bedrock is exposed but elsewhere rock outcrops occupy less than 5 per cent of the map-area. Drift deposits, chiefly of glacial origin, mantle the timbered slopes and spread out widely and deeply over most of the lowland areas.

The Palaeozoic rocks (1, 2, 3) have been subdivided into three lithologically distinct and apparently conformable groups. In the lowest group (1) chert forms beds one-half to two inches thick, commonly minutely crumpled and separated by thin partings of argillite. In many places exposures of these strata hundreds of feet thick were observed. The other argillaceous members of the group are thinly-bedded and carbonaceous. Fossil crinoid stems of doubtful age were obtained from limestone strata of the upper group (3) which is about 4,000 feet thick. These beds and those of the underlying groups, are similar lithologically to formations in the East Half of the Fort Fraser map-area and covering wide areas elsewhere in British Columbia from which fossils of Carboniferous and Permian age are reported to have been found. In this area the Palaeozoic rocks are closely folded in a general northwesterly direction and are variously metamorphosed by the larger intrusive bodies (7a, 7b, 8a, 8b) across widths of from a few hundred yards to as much as two miles.

The intrusive rocks (4-8) form a group in which the more acid bodies are, in general, the younger. The ultra-basic rocks (4, 4a, 4b) have been partly to completely serpentinized. Contacts between them are gradational. Dunite forms irregular masses one-half to two square miles in area within bodies of peridotite. Most of the pyroxenite occurs in areas bordering bodies of peridotite but small masses of it were also observed within the peridotite bodies. Between Trembleur Lake and Mount Sidney Williams about 10 per cent of the serpentinized peridotite has been altered hydrothermally, in part to carbonate-quartz-mariposite rocks, and, to a lesser extent, to greenish-buff carbonate-talc rocks. The alteration occurs along fractured zones striking north and ranging from 10 to 500 feet wide. These zones alternate with bands of partly serpentinized peridotite of about equal widths. The carbonate-quartz-mariposite rocks are mottled, crystalline rocks containing conspicuous amounts of the bright green, chrome-bearing mica, mariposite. In some localities bodies of serpentine are sheared into ellipsoidal masses up to 3 feet in diameter. In places gabbro (4c) cuts the ultrabasic rocks, in other places it grades into them indicating that the gabbro is perhaps of more than one age. Most of the acid intrusive bodies in the map-area have been deeply eroded. In addition to the intrusive rocks mapped are many aplitic, pegmatitic, and lamprophyric dykes up to 10 feet wide, associated principally with larger bodies of intrusive rocks (5-8).

In the northwest part of the area is a series of andesitic lavas and fragmental volcanic rocks (9) at least 1000 feet thick. The most characteristic member is an eruptive andesite breccia containing fragments of the underlying granite (7b) and syenite (6). Sedimentary strata conformably underlie these volcanic rocks north of Topley, in the adjoining Smithers map-area (East Half), and have provided a collection of plant remains comprising the genus *Otozamites* and sterile specimens of an unidentified matoniaceous fern. Similar forms are characteristic of the Jurassic but some species have a wide range extending from Upper Triassic into Cretaceous time.

The lavas (10) north of Tochchaw Lake have been traced northward beyond the map-area to where they are interbedded with sedimentary rocks containing marine shells of probable Jurassic age. The associated lavas are intruded by granitic rocks. Their age relations to the intrusive rocks of this map-area are not known.

The series of andesitic and related lavas (11) outcropping between François, Tchesinkut, and Burns Lakes is at least 2,000 feet thick. Intercalated with them is a band of conglomerate and arkose about 100 feet thick that extends from Endako River south to François Lake. At the west end of Tchesinkut Lake the band strikes north 29 degrees east and dips 45 degrees southwest. Many pebbles of pink granite occur in the conglomerate and dicotyledonous leaves of post-Lower Cretaceous age were found in the more shaly beds. The lavas (12) capping the hill southwest of Savory are probably of the same age.

The Eocene or Oligocene sediments (13) contain plant remains and thin seams of lignite. They are about 250 feet thick. Overlying and partly interbedded with them are volcanic rocks (14) and these, in turn, are intersected by rhyolitic and granophyric dykes and stocks that probably represent a late stage in this period of volcanism. The late Cretaceous and early Tertiary rocks (11-14) are only slightly deformed as compared with older formations in the map-area. Dips are rarely greater than 30 degrees.

The post-Eocene volcanic rocks (15) rest unconformably and nearly horizontally on Eocene or Oligocene rocks (13-14). In places they are as much as 2,000 feet thick. Related to them are many andesitic and basaltic dykes up to 30 feet wide. Poorly consolidated conglomerate (15a) carrying abundant pebbles of post-Eocene lava, overlies the volcanic rocks.

Since the completion, in 1913, of the Canadian National Railways from Jasper to Prince Rupert, prospecting in the map-area, particularly south of Babine Lake, has been quite active though no property has yet reached the productive stage. The discoveries comprise silver-lead-zinc, copper, gold-quartz and molybdenite deposits. The silver-lead-zinc deposits are irregular veins, 2 inches to 3½ feet wide, occurring along shear zones and in fissures. The metallic minerals are galena, sphalerite, chalcopyrite, and tetrahedrite; the gangue minerals are quartz, ankeritic carbonate, barite, and fluorite. The deposits occur in Eocene or Oligocene and older volcanic rocks (14, 10, 2a) near their contacts with younger intrusives (7b, 14). The only copper deposit is located on Boo Mountain. It occurs in a zone of fracturing, 20 feet wide, in sheared andesite (10). The chief minerals are chalcopyrite, pyrite, and specularite in a quartz gangue. The gold-quartz deposits are of two quite different types in both of which the values are low. Those on the north slope of Taltapin Mountain occur at the contact of metamorphosed Palaeozoic volcanic rocks (2a) with bodies of diorite (5b) and later granodiorite. They consist of several irregular lenses of glassy quartz, 20 to 30 feet thick and 100 to 200 feet long, carrying minor amounts of pyrite, chalcopyrite, and molybdenite. Epidote, magnetite, and pyrite are disseminated through the adjacent rocks. The deposit north of Boer Mountain is a pyritized granite porphyry dyke cutting pink granite. Quartz veins up to 2 feet wide occur in the granite body (7b) south of Endako. They carry molybdenite and this mineral is disseminated in the granite bordering the veins. Molybdenite also occurs in a pegmatite dyke south of Ling Lake.

A small vein containing asphaltum and the rare phosphates, collinsite and quercyite, occurs in a vesicular andesite on the Collier Ranch near François Lake. Small deposits of chrysotile and tremolite asbestos have been found in the serpentinized peridotite of Mount Sidney Williams.

Joins Map 630A, "Fort Fraser, East Half."

MAP 631A

FORT FRASER

(WEST HALF)

COAST DISTRICT

BRITISH COLUMBIA

Scale, ~~1/253440~~ or 1 Inch to 4 Miles

Miles 4 0 4 8 12

Approximate magnetic declination, 29°15′ East.

PUBLISHED, 1941.

631A