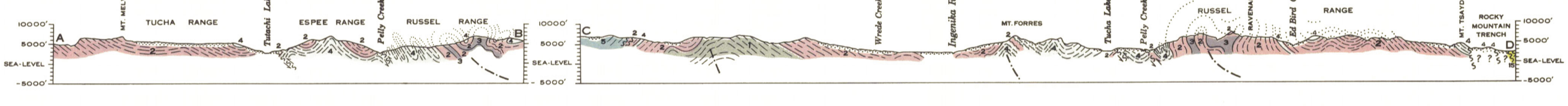
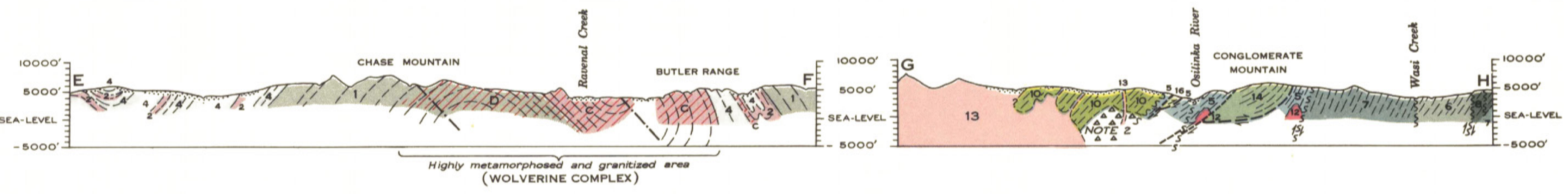
CANADA
DEPARTMENT
OF
MINES AND TECHNICAL SURVEYS

GEOLOGICAL SURVEY OF CANADA





Diagrammatic structure-sections along lines A-B, C-D, E-F and G-H

LEGEND

Fault movement as indicated in plane of section
First thrust fault effective in emplacing map units 14 and 16
Series of second thrust faults effective in emplacing map units 14 and 16
Axial plane of major fold

LEGEND

MESOZOIC OR CENOZOIC

CRETACEOUS OR TERTIARY
UPPER CRETACEOUS OR LATER
SUSTUT GROUP (15, 16)

16 — *Conglomerate, sandstone, shale, coal. Possibly post-Paleocene*

15 — *SIFTON FORMATION: conglomerate; relation to 16 unknown Upper Cretaceous or Paleocene*

MESOZOIC

CRETACEOUS
LOWER CRETACEOUS

14 — *USLIKA FORMATION: conglomerate, minor argillite*

JURASSIC OR CRETACEOUS
UPPER JURASSIC OR LOWER CRETACEOUS
OMINECA INTRUSIONS (11-13)

13 — *Granodiorite, adamellite-granite; quartz diorite; minor syenite, syenodiorite, diorite, alaskite, pegmatite, aplite, lamprophyre, and feldspar porphyry. Represents undivided Omineca intrusions in a few less known, and in small, highly complex, parts of the Hogem batholith*

12 — *Quartz diorite, diorite; minor syenodiorite, meladiorite, appinite, hornblendite, and uralite amphibolite*

11 — *Hornblendite, feldspathic hornblendite, appinite; meladiorite; minor hornblende diorite, biotite peridotite, and uralite amphibolite*

TRIASSIC AND JURASSIC
UPPER TRIASSIC AND LATER
TAKLA GROUP

10 — *Andesitic flows and breccias; basalt, tuff, agglomerate, shale, conglomerate, limestone*

PALÆOZOIC

PERMIAN (?) OR LATER
POST-MIDDLE PERMIAN, PRE-UPPER TRIASSIC (?)
TREMBLEUR INTRUSIONS (?)

9 — *Peridotite; dunite, pyroxenite, serpentinite; 9a, includes hornblendite and related rocks*

PENNSYLVANIAN (?) AND PERMIAN
CACHE CREEK GROUP (6-8)

8 — *Limestone; minor argillite, chert, and andesite; may be partly or entirely older than 6 or 7*

7 — *Argillite, slate, ribbon chert; greenstone; minor tuff and limestone; may be in part of same age as 6*

6 — *Andesitic and basaltic flows, tuffs, breccias; agglomerate; minor argillite, slate, chert, limestone; may be in part of same age as 5 and 7*

MISSISSIPPIAN TO PERMIAN (Mainly or entirely)

5 — *Tuff; andesitic and basaltic folds, agglomerate, greywacke; sandstone, grit, conglomerate; minor limestone, chert, shale, argillite; may be in part of same age as 6 and 7*

CAMBRIAN AND (?) EARLIER
LOWER CAMBRIAN (Partly or entirely)
INGENIKA GROUP (2-4)

4 — *Limestone, in part micaceous; interbedded with 2*

3 — *White quartzite; interbedded with 2*

2 — *Quartz-chlorite schist, sericite schist, quartzite, slate, phyllite, quartzitic conglomerate; minor limestone, chloritoid schist, and tourmaline-zoisite schist*

PROTEROZOIC

TENAKIHI GROUP

1 — *Quartz-mica schist, garnetiferous schist; micaceous, garnetiferous, and feldspathic quartzite; minor kyanite schist, staurolite schist, quartz-mica-feldspar augen-gneiss*

A — *Feldspar porphyry, granophyre, dacite: A1, diorite(?)-porphyry post-Lower Cambrian, may be Tertiary*

WOLVERINE COMPLEX (B-D)

B — *Granodiorite; minor leucogranite, alaskite, pegmatite, aplite*

C — *Feldspathic quartzite, quartz-mica-feldspar gneiss, migmatite, leucogranite, silicated marble, skarn, amphibolite; metamorphosed and granitized equivalent of 2, 3, and 4*

D — *Feldspathic quartzite, quartz-mica-feldspar gneiss, migmatite; includes some lit-par-lit gneiss; metamorphosed and granitized equivalent of 1*

NOTE 1. Areas of hornblendite, feldspathic hornblendite, and hornblende-feldspar hybrid rock; biotite-bearing pyroxenite, hornblendite, and hornblende-feldspar rock; epidote-rich rocks; 'pseudo-diorite'; garnet-olivine-serpentine-bearing marbles; and andalusite schists developed in andesitic flow and pyroclastic rocks, greywackes, limestones, and argillites of map-unit 5 at contact with ultramafic intrusions (9). Red crosses indicate areas of rocks profoundly altered near contact with ultramafic intrusions

NOTE 2. Pre-Lower Jurassic feldspar porphyry, found as inclusions in Takla group (10), and possibly as stocks too small to be shown on the map (See Structure-section G-H).

Heavily drift-covered area
Bedding (horizontal, inclined, vertical, overturned)
Schistosity, gneissosity (inclined, vertical)
Lineation (plunge known, plunge unknown)
Anticline (indicating approximate position of crest line)
Syncline (indicating approximate position of trough line)
Fault, fault zone, shear zone
Glacial striæ or groovings (cordilleran ice-sheet only)
Fossil locality
Sink hole
Mineral occurrence ×Cu
Prospect (See list) 2
Adit

SYMBOLS FOR METALS AND MINERALS

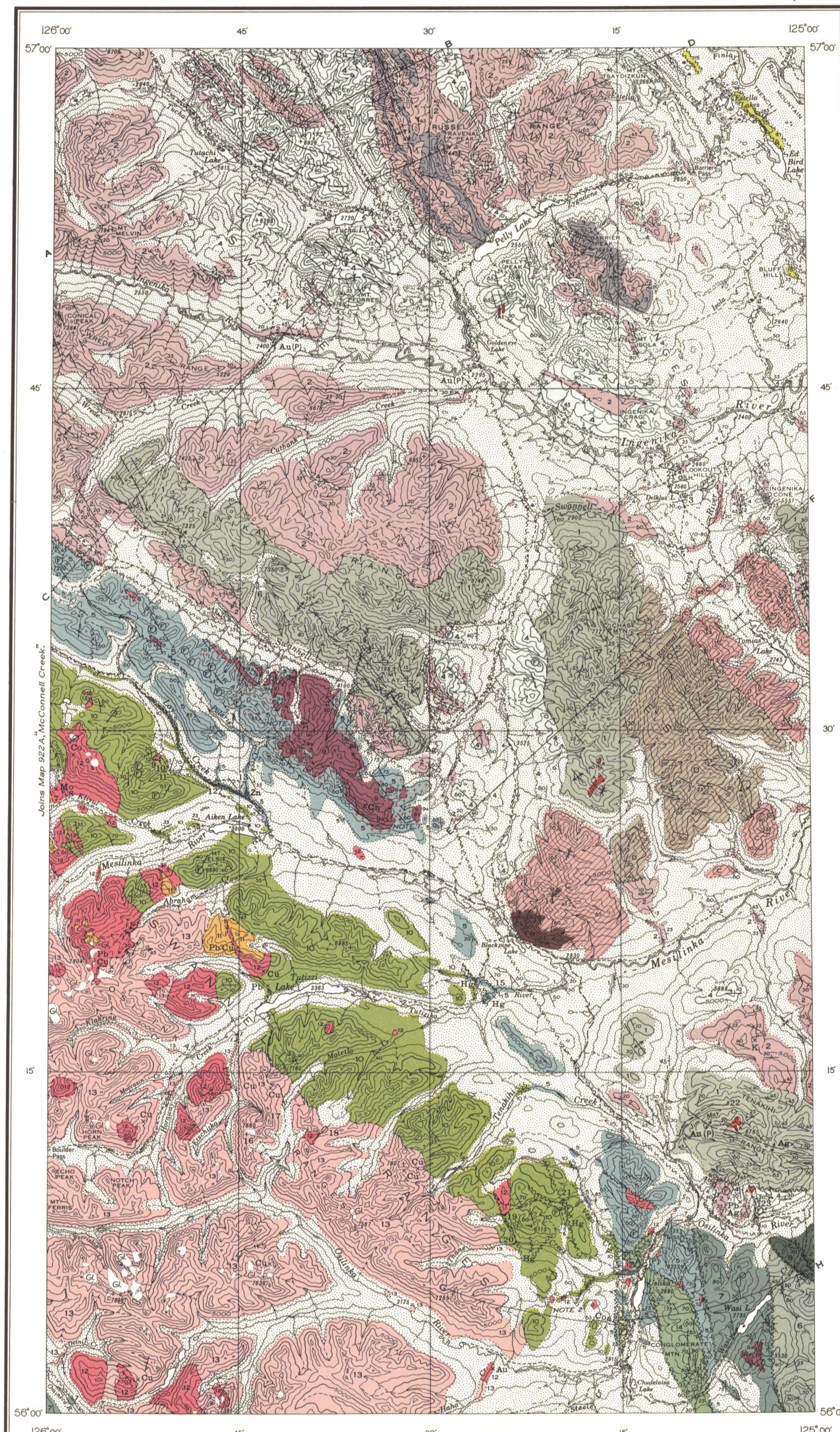
Coal	Coal	*Gold (Placer)*	Au(P)	*Potassium nitrate and related salts*	K
Cobalt	Co	*Iron*	Fe	*Silver*	Ag
Copper	Cu	*Lead*	Pb	*Zinc*	Zn
Corundum	Cn	*Mercury*	Hg		
Gold (Lode)	Au	*Molybdenum*	Mo		

LIST OF PROSPECTS

1 Ingenika group (Au, Pb, Zn, Fe)	13 Polaris group (Au)
2 Ferguson group (Pb, Zn, Ag)	14 Hope group (Au)
3 Onward group (Pb, Zn)	15 Stranger group (Au?)
4 Burden group (Cu)	16 Chief Thomas showings (Cu)
5 Swannell group (Zn, Pb, Ag)	17 Elizabeth group (Au, Ag)
6 Orion group (Ag, Pb)	18 Matetlo copper showings (Cu, Ag)
7 Porphyry Creek workings (Cu, Mo)	19 Pluto group (Au)
8 Croydon group (Au, Cu, Mo)	20 Thane group (Au)
9 Granite Basin group (Au)	21 Vega group (Au, Cu)
10 Halquinn group (Au)	22 Ruby group (Ag, Au, Zn, Pb)
11 Red Dyke group (Au)	23 Beveley group (Pb, Zn)
12 Jupiter group (Au, Zn, Pb, Ag)	24 Weber group (Pb, Zn, Ag)

Geology by J. E. Armstrong, 1945; E. F. Roots, 1946, 1947, 1948

GEOLOGICAL SERIES — SHEET 94 C (West Half)



PUBLISHED, 1954

MAP 1030A

AIKEN LAKE

CASSIAR DISTRICT
BRITISH COLUMBIA

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

Miles

Approximate magnetic declination, 29°48' East

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

DESCRIPTIVE NOTES

Aiken Lake, in the west-central part of the map-area, may be reached by a winter tractor road, 95 miles long, from Germansen Landing on Omineca River. A fair motor road about 185 miles long extends south from Germansen Landing, via Fort St. James, to Vanderhoof on the Canadian National Railways. Ingenika River is navigable for small river craft as far west as Wrede Creek, and may be reached from Fort Grahame on Finlay River, 40 miles downstream from Ingenika Crag and 250 miles by water and road from Prince George on the Canadian National Railways. The nearest convenient supply base and charter aircraft terminal is Fort St. James at the southeast end of Stuart Lake, 150 air miles southeast of Aiken Lake.

Timber-line is at about 5,000 feet above sea-level; above it, and in numerous stream canyons, bedrock is well exposed. Elsewhere the area is covered by a thick layer of glacial drift and colluvial material supporting a moderate forest growth.

The oldest known rocks in the map-area are quartz-mica and garnetiferous schists and micaceous and feldspathic quartzites and gneisses, to which the name TENAKIHI group (1) has been given. They are exposed, to a thickness of at least 13,000 feet, in the crests of anticlinoria that trend northwesterly through the northeast half of the map-area. The age of the Tenakihi group is not known, but the rocks underlie Lower Cambrian strata of the Ingenika group; they are lithologically similar to, and may represent a northwest extension of, Proterozoic rocks of the Cariboo district.

The INGENIKA group (2-4) includes not less than 18,000 feet of quartz-chlorite schist, sericite schist, chloritic quartzite, pure white quartzite, slate, phyllite, and quartzitic conglomerate, with interbedded blue-grey and buff, partly sericitic, crystalline limestone. It rests on the Tenakihi group, in places without apparent angular discordance, on the flanks of the anticlinoria, and underlies almost all of the northern third of the map-area. Pleospongia of Lower Cambrian age have been found at one place in these rocks.

The rocks of the Tenakihi and Ingenika groups have been regionally metamorphosed and deformed as a unit, and in general present a sequence of increasing metamorphic grade at successively lower stratigraphic horizons that is remarkably constant over the entire exposed area. The regional metamorphism apparently took place prior to, and was not appreciably affected by, the last major deformation of these rocks. North and east of Blackpine Lake, the regionally metamorphosed Tenakihi and Ingenika strata have been further altered by metamorphism and granitization into feldspathic quartzites, quartz-mica-feldspar gneisses, migmatites, leucogranites, and granodiorites, with minor skarn and amphibolite. These rocks, now distinct from the regionally metamorphosed Tenakihi and Ingenika rocks, resemble rocks exposed in the Wolverine Range to the southeast, and have been included in the WOLVERINE COMPLEX (B-D).

Conspicuously banded, green, yellow, and red-brown tuff and greywacke, with andesitic and basaltic lavas, agglomerate, and minor sandstone, grit, conglomerate, limestone, chert, and shale, compose a distinct assemblage (5) as much as 17,000 feet thick, exposed in a belt about 10 miles wide extending northwesterly across the central part of the map-area. Fossils of late Palæozoic age have been found at several places in these rocks; the most diagnostic are corals indicating a Mississippian horizon, but the assemblage may include beds of different ages. At all known exposures, rocks of this map-unit are in contact with those of adjoining map-units along either intrusive or fault boundaries.

Grey-green andesitic flows and breccias, brown and black argillite and slate, "ribbon cherts" composed of thin beds of white or grey chert separated by fine partings of argillite, and massive to finely bedded, coarsely crystalline to compact limestone are exposed in fault-bounded blocks in the southeast corner of the map-area. Similar rocks outcrop in the extreme southwest corner. Brachiopods of Pennsylvanian or Permian age have been found in these rocks (6-8), which are an apparent extension of strata of the CACHE CREEK group of central British Columbia.

Peridotite, serpentinite, dunite, and pyroxenite comprise one large and numerous smaller bodies (9), which cut the late Palæozoic rocks in the southeastern, central, and western parts of the map-area, and whose borders in places are characterized by an extensive development of hornblendite and related hybrid rocks. These bodies have been tentatively grouped with the post-Middle Permian, pre-Upper Triassic (?) TREMBLEUR INTRUSIONS of east-central British Columbia.

Andesitic flows and breccias, with minor basalt, tuff, agglomerate, shale, conglomerate, and limestone, outcrop in a belt up to 15 miles wide crossing the southwest-central part of the area. These rocks (10) contain fossils of Upper Triassic and Jurassic age, and have been identified with the TAKLA group of the Fort St. James map-area to the south and southeast. The Takla group contains inclusions of feldspar porphyry that, apparently, represent pre-Jurassic intrusive rocks (not shown on map).

The Upper Jurassic or Lower Cretaceous OMINECA INTRUSIONS (11-13) are represented within the map-area by a part of the Hogem batholith, occupying about 450 square miles in the southwest corner, and by numerous smaller bodies cutting the Takla group and late Palæozoic rocks. They include a wide variety of lithological types, ranging from basic to very acidic, and are apparently the result of a prolonged and complex sequence of intrusions. The oldest rocks of the series, present in minor amount, are hornblendites, appinites, and meladiorites; these have been invaded by more extensive bodies of diorite, quartz diorite, and syenodiorite. The most abundant rocks of the Omineca intrusions in the map-area are, however, light grey to pale buff granodiorites and lime-rich (adamellite) granites, which cut all others of the series except minor, younger, pegmatite, aplite, and feldspar porphyry dykes. The intrusions cut Jurassic strata of the Takla group, and, at least in part, were unroofed in time to supply boulders too, apparently, Lower Cretaceous beds of the Uslika formation.

The USLIKA formation (14), 4,200 feet thick, consists mainly of conglomerate. It is exposed east and north of Uslika Lake, and in lower Vega Creek Valley is accompanied by black argillite. The conglomerate is a massive, poorly bedded, apparently single body. It is composed mainly of well-rounded boulders, up to 1 foot in diameter, of volcanic, sedimentary, and metamorphic rocks identifiable with many of the older formations in the area, and of igneous rocks of intermediate composition similar to some found among the Omineca intrusions, in a relatively fresh, grey-green, gritty, greywacke matrix. Wherever exposed, the contacts of the conglomerate body are highly sheared, and the formation is thought to have been downfaulted into its present position in the late Palæozoic rocks. No fossils have been found in the conglomerate, but the adjoining, apparently conformable, argillite beds on Vega Creek contain plant remains of late Lower Cretaceous age.

Sedimentary rocks of late Cretaceous or early Tertiary age are found at two places in the map-area; both bodies have been provisionally correlated with the continental SUSTUT group of the McConnell Creek map-area to the west. Conglomerate, consisting of limestone, slate, schist, vein quartz, and quartzite pebbles in a sandy matrix, outcrops in the floor of Finlay River Valley (the Rocky Mountain Trench) in the northeast corner of the map-area. No fossils have been found in these rocks (15) within the map-area, but the conglomerate appears to be part of a belt of similar rocks found in the Rocky Mountain Trench in Finlay and Kechika River Valleys, to which the name SIFTON formation has been given, and in which Upper Cretaceous or Paleocene plant fossils have been found.

A small, apparently isolated body of conglomerate, sandstone, shale, and coal, containing late Cretaceous or early Tertiary plant remains, is exposed southwest of Uslika Lake. The relations of this body (16) to other rock-units of the map-area are not shown.

Dykes and small stocks of dacite and feldspar porphyry (A) of post-Lower Cambrian but otherwise unknown age cut the Tenakihi and Ingenika groups.

The major structures of the map-area trend northwesterly. Beds of the Tenakihi and Ingenika groups have been deformed into a series of compound folds, inclined or overturned to the southwest, that have overwhelmed apparently earlier, gentler, more north-trending folds. North of Ingenika River, the deformation is more intense, and an intervening synclinorium has broken into a thrust fault along Pelly Creek Valley.

Most of the other formations are intersected by steeply dipping, northwest-trending faults or fault zones of great length and unknown displacement, including the Pinchi (Omineca) fault zone in the extreme southwest corner of the area and the wide zone of major faulting in the Rocky Mountain Trench in the extreme northeast. Between them are many transverse faults, striking north, northeast, and east. The largest of these, in the central Swannell River Valley, has a horizontal displacement of about 10 miles. In places, faults and shattered zones are too numerous to be adequately represented on the map.

The Hogem batholith has been emplaced along what appears to have been the axis of a large syncline of late Palæozoic and early Mesozoic rocks.

Lead, zinc, and silver minerals occur at several places in the rocks of the Tenakihi and Ingenika groups. The largest known deposits, on the claims of the Ferguson and Beveley groups, are bedding-plane replacement bodies in folded Ingenika limestones. On the Ruby group of claims, fractures in large quartz veins cutting Tenakihi group quartzites and schists have been healed with pyrargyrite and silver-lead minerals.

The sedimentary and volcanic rocks near the Hogem batholith, and the marginal parts of the batholith itself, contain a variety of metallic mineral deposits. Among these are the high-temperature gold-chalcopyrite-molybdenite and gold-magnetite deposits in hornblende diorite near Croydon and Kliyul Creeks, and numerous low-grade chalcopyrite deposits in shear zones in grandiorite, as exemplified by the Matetlo copper showings. Much of the mineralization in evidence is represented by vein fillings in fault zones, of which the chalcopyrite deposits of the Vega group, the chalcopyrite-galena veins north of Tutizzi Lake, the gold-pyrite stringers on the Polaris group, the pyrrhotite-chalcopyrite bodies on Polaris Creek, and the tetrahedrite-galena-sphalerite veins on the Jupiter group are examples. Large shear zones containing abundant disseminated pyrite are found at several places in the rocks of the Takla group; at the Granite Basin property one such shear zone carries gold. Cinnabar occurs as fine stringers, blebs, and cavity fillings in carbonatized shear or fault zones and chalcedony-ankerite veins in Takla group volcanic rocks near Tutizika River and Vega Creek.

The gravels on Jim May Creek and on Ingenika River below Wrede Creek have been worked intermittently for placer gold since 1899.

LEGEND

Wagon road or winter tractor road
Trail and cabin
Lake and stream (position approximate)
Fall or rapid
Glacier
Marsh
Sand or gravel
Contours (interval 500 feet)
Contours (position approximate)
Height in feet above mean sea-level

Base-map compiled by the Topographical Survey, 1942, from original surveys, and from information supplied by the British Columbia Department of Lands. Cartography by the Geological Cartography Division, 1953.