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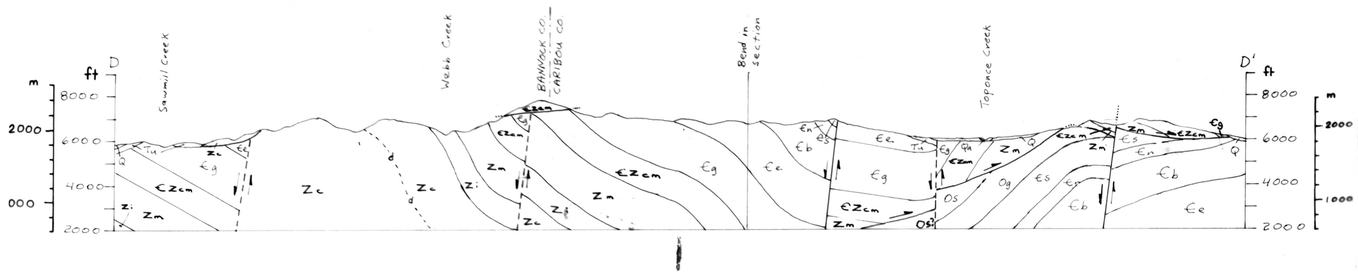
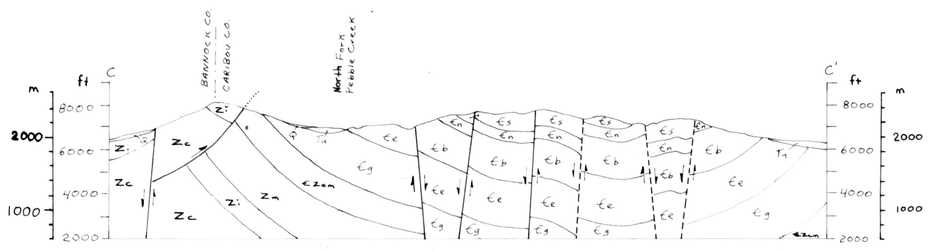
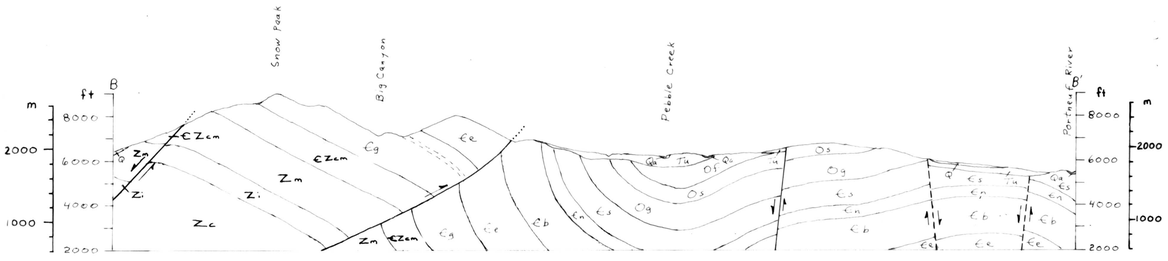
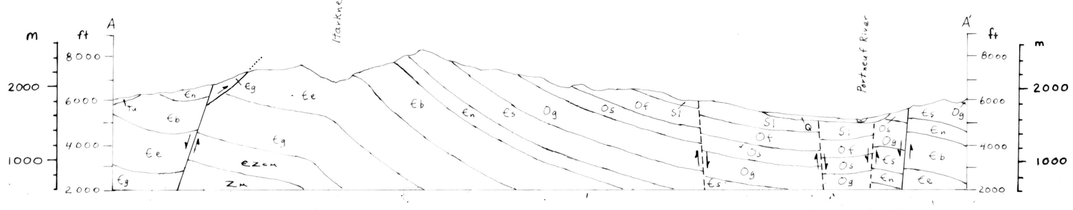
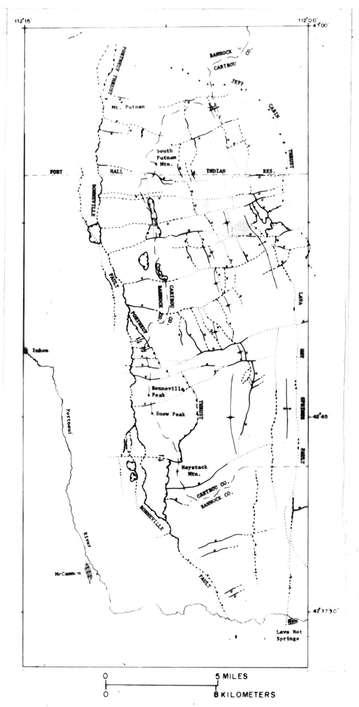


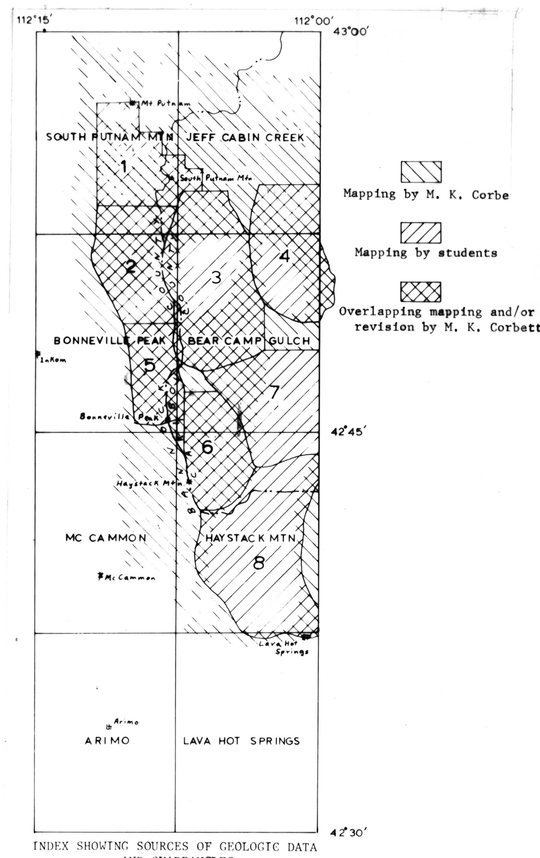








TECTONIC MAP OF NORTHERN PORTNEUF RANGE



INDEX SHOWING SOURCES OF GEOLOGIC DATA AND QUADRANGLES

EXPLANATION

FAULTS--Dashed where approximately located; dotted where concealed; queried where uncertain

Normal fault--Cenozoic basin and range; hachures on downthrown side

High-angle fault--Post thrust, pre-basin and range with probable basin and range movement; U, upthrown block, normal movement; R, upthrown block, reverse movement

Tear fault--Late Mesozoic; arrows indicate relative movement

Thrust fault--Late Mesozoic; teeth on upper plate

PROBABLE GRAVITY SLIDE BLOCK

FOLDS--Dashed where approximately located; dotted where concealed; queried where uncertain

Anticline

Syncline

SOURCES OF GEOLOGIC DATA

1. Allen, R. W., 1976, Geology of South Putnam Mountain, Bannock and Caribou Counties, Idaho: Idaho State University M.S. thesis, 63 p.

2. Hand, P. A., (in progress), Geology of the Inman-Webb-Sawmill Creek area, Bannock and Caribou Counties, Idaho: Idaho State University M.S. thesis.

3. Nelson, L. B., (in progress), Geology of the Toponce Basin area, Caribou County, Idaho: Idaho State University M.S. thesis.

4. Wieland, E. P., 1977, Geology of the Toponce Creek area, Caribou County, Idaho: Idaho State University M.S. thesis, 30 p.

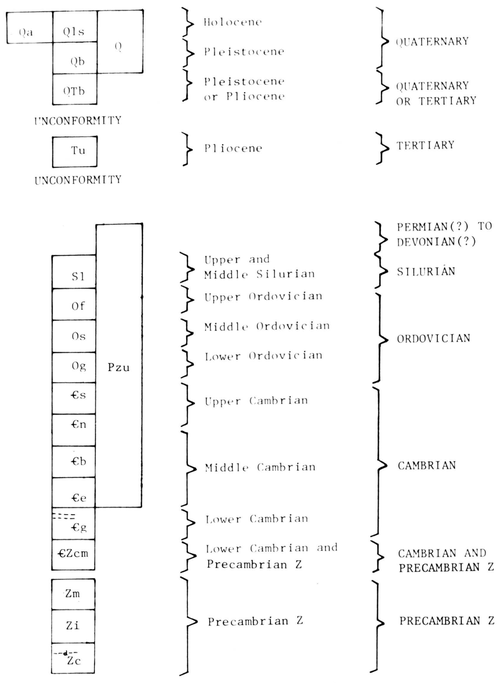
5. Duncan, G. A., 1978, Geology of the Bonneville Peak area, Bannock and Caribou Counties, Idaho: Idaho State University M.S. thesis, 29 p.

6. Martin, P. W., 1977, Geology of the Haystack Mountain area, Northern Portneuf Range, Caribou County, Idaho: Idaho State University M.S. thesis, 23 p.

7. Perkins, R. W., 1977, Geology of the Pebble Creek area, Caribou County, Idaho: Idaho State University M.S. thesis, 50 p.

8. Anderson, N. N., 1978, Geology of the East Bob Smith Creek area, Bannock and Caribou Counties, Idaho: Idaho State University M.S. thesis, 44 p.

CORRELATION OF MAP UNITS



SYMBOLS

CONTACT--Dashed where approximate; queried where uncertain; hanging lines indicate unmapped area

NORMAL FAULT--Dashed where approximate; dotted where concealed; queried where uncertain. U, upthrown side

REVERSE FAULT--Dashed where approximate; dotted where concealed. R, upthrown side

TEAR FAULT--Dashed where approximate; dotted where concealed. Arrows show relative motion

THRUST FAULT--Regional overthrust type. Dashed where approximate; dotted where concealed; queried where uncertain. Sawteeth on upper plate

THRUST FAULT--Local gravity type. Outlines coherent slide blocks. Sawteeth on upper plate

KEY HORIZONS--Exclusive of unit contacts

Base of dolomite in Caddy Canyon Quartzite, where present

Limestone of Gibson Jack Formation, where present

FOLDS--Showing trace of axial plane. Dotted where concealed

Anticline

Overturned anticline

Syncline

STRIKE AND DIP OF BEDS

Inclined

Vertical

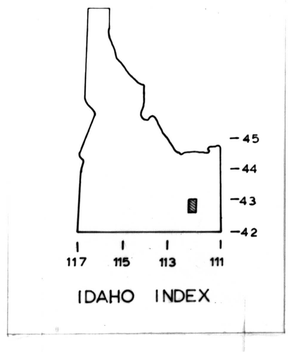
Overturned

STRIKE AND DIP OF FOLIATION

Inclined

CONNECTOR--Indicates same unit

FOSSIL LOCALITY AND NUMBER--U.S. Geological Survey Cambrian-Ordovician Fossil Catalog, Denver, Colo.



DESCRIPTION OF MAP UNITS

SURFICIAL DEPOSITS (HOLOCENE AND PLEISTOCENE)--Age ranges of individual units overlap

Qa Alluvium--Unconsolidated coarse- to fine-grained deposits of the modern floodplain

Qls Landslide deposits--Active to inactive slump blocks, slides, and debris- and mudflows

Q Undifferentiated deposits--Includes alluvial fan deposits, colluvium, loess, stream terrace deposits, and other poorly sorted unconsolidated materials

Qb BASALT OF PORTNEUF VALLEY (PLEISTOCENE)--Dark-gray to black basalt, locally diktytaxitic. One or more columnar-jointed flows exposed discontinuously along the Portneuf River from Lava Hot Springs to McCammon

QTb BASALT (PLEISTOCENE OR PLIOCENE)--High-level remnants of flows considered to overlie earlier Tertiary deposits. The basalt, exposed just north of Lava Hot Springs, is dark-gray to black, highly vesicular, and contains numerous phenocrysts of plagioclase and olivine. Thickness probably 20-25 m (70-80 ft)

Tu UNDIFFERENTIATED PLIOCENE DEPOSITS--Unconsolidated to partly consolidated coarse fanglomerate, valley-fill gravel, and lake-bed sand and clay, commonly mapped as Salt Lake Formation which is of Miocene as well as Pliocene age, generally overlying but partly interbedded with rhyolitic, andesitic, and basaltic tuffs and agglomerates considered to be Starlight Formation or its equivalent. Thickness about 200 m (several hundred feet)

Pzu UNDIFFERENTIATED PALEOZOIC UNITS--(PERMIAN(?) TO CAMBRIAN)--Known exposures include Ordovician Fish Haven Dolomite, Swan Peak Quartzite, and Garden City Formation (Mansfield, 1920). Post-Ordovician and Upper and Middle Cambrian formations may also be present, although none were recognized. This unit included only to provide basis for thrust fault relationships

Sl LAKETOWN DOLOMITE (UPPER AND MIDDLE SILURIAN)--Coarsely crystalline dolomite consisting of lower light-gray, thin- to medium-bedded dolomite grading upward into very light gray, medium-bedded to massive dolomite. Top of unit not exposed, but darker gray, fossiliferous dolomite occurs near the top of section west of the Portneuf River valley north of of Lava Hot Springs. Lower contact with Fish Haven Dolomite appears gradational and is placed at the base of light-gray dolomite overlying the uppermost dark- to mottled-gray dolomite of Fish Haven. Maximum thickness 250 m (825 ft)

Of FISH HAVEN DOLOMITE (UPPER ORDOVICIAN)--Finely crystalline dolomite; upper part thin- to medium-bedded, alternating gray and lighter- or mottled-gray, coarsely crystalline dolomite with some brachiopod and coral fossils; middle to lower portion dominantly gray to dark-gray, medium- to fine-grained, massive dolomite containing black chert and abundant brachiopod and coral fossils. Thickness about 270 m (890 ft)

Os SWAN PEAK QUARTZITE (MIDDLE ORDOVICIAN)--Massive to thick-bedded, white to light-gray or tan quartzite with basal zone about 30 m (100 ft) thick of light-brown feldspathic sandstone. The quartzite contains abundant fucoidal markings and weathered surfaces commonly are heavily ironstained. Quartzite rubble commonly conceals bedrock. The best complete section is along East Bob Smith Creek, where thickness, although variable, totals 205 m (675 ft)

Og GARDEN CITY FORMATION (LOWER ORDOVICIAN)--Medium- to thick-bedded, slabby, blue- to light-gray limestone and dolomitic limestone, fine- to medium-grained, interbedded with abundant limestone intraformational pebble conglomerate and bioclastic layers in lower portion. Black chert nodules and bands common, and the unit is highly fossiliferous where not heavily dolomitized. The base of the unit is at the top of the uppermost coarsely crystalline dolomite of the St. Charles Formation, which generally coincides with the first appearance of limestone pebble conglomerate. Thickness variable, ranging from 365 m (1,200 ft) in the southern part of the map area to 304 m (1,000 ft) along the east flank of Haystack Mountain

€s ST. CHARLES FORMATION (UPPER CAMBRIAN)--Unit contains two distinct and recognizable members not mapped separately because of poor exposure; east flank of Haystack Mountain provides best exposures for determinations of thickness and lithology; total thickness of the St. Charles uniformally about 330 m (1,090 ft)

Dolomite member--Medium dark- to bluish-gray, coarsely crystalline, variably bedded dolomite. Thickness about 250 m (820 ft), thickening northward

Worm Creek Quartzite Member--Interbedded feldspathic and crossbedded tan to yellow-tan sandstones and thin layers of gray dolomite grading upward into fine- to medium-grained, potash-feldspar-rich, tan to red, friable sandstones, which are overlain by thick, massive, light-tan to white quartzites; in the Toponce basin area, between Trail Creek and South Fork Toponce Creek, the Worm Creek Quartzite Member crops out extensively as ridge-top cappings owing to both fault and fold repetition. The lower contact is at the base of the lowest sandstone overlying pink to light-gray Nounan Dolomite. Thickness about 80 m (270 ft) thickening southward

€n NOUNAN DOLOMITE (LOWER AND MIDDLE CAMBRIAN)--Nontossiliferous dark blue-gray, coarsely crystalline, medium- to thinly bedded limestone, oolitic and dolomitic in part, containing yellow and reddish silty partings, grading upward to highly distinctive massive, pink to pinkish-gray, finely crystalline dolomite and light- to medium-gray dolomitic limestone. Sandstones described by Trimble and Carr (1976) do not occur in the northern Portneuf Range, except for an outcrop of tan to reddish medium- to fine-grained, crossbedded sandstone about 35 m (120 ft) above the base in northwest quarter of Sec. 19, T7S, R36E. Lower portions of the unit commonly are covered. The base of the unit is at the top of the highest shale or siltstone of the Bloomington Formation. Estimated thickness about 180 m (600 ft)

€b BLOOMINGTON FORMATION (MIDDLE CAMBRIAN)--Light-gray to blue-gray limestone and intraformational limestone conglomerate interbedded with tannish-green to olive shale, argillite, and siltstone. Shale and siltstone commonly contain abundant nodules of pale gray-green, fine-grained limestone. Limestone is finely crystalline, commonly oolitic, and contains tan to yellowish-tan silty partings. A tan to reddish-brown, fine- to medium-grained quartzose sandstone occurs about 120 m (400 ft) above the base. Oncoliths are common in limestone layers and occasional trilobite (Olenoides sp., locality D2784-CO; M. E. Taylor, written commun., Feb. 16, 1978) and brachiopod fragments are present throughout the unit. On the east flank of Haystack Mountain, mid-Bloomington shales enclose several lenticular masses of intraformational limestone conglomerate ranging up to 18 m (60 ft) thick and 120 m (400 ft) long. In the upper Harkness Creek area, individual limestone beds are thicker than normal. Northward the unit is more shaly and thins. Lower contact is at base of first shale or siltstone above massive to thick-bedded carbonates of the Elkhead Limestone. Greatest thickness, 520 m (1,705 ft), is in the upper Harkness Creek area

€e ELKHEAD LIMESTONE (MIDDLE CAMBRIAN)--Medium- to dark-gray, massive to thickly bedded limestone containing yellowish-tan silty partings and numerous oncoliths. The unit is equivalent to all of the Langston, Ute, and Blacksmith Limestones of Walcott (1908) or Twin Knobs Limestone, Lead Belle Shale, Bancroft Limestone, and Blacksmith Limestone of Oriel and Armstrong (1971). Exceptional exposures of nearly the complete unit occur both on the west flank of Haystack Mountain and at the head of Harkness Creek, where the unit includes about 60 m (200 ft) of thinly bedded, slabby to platy, gray limestone a few hundred feet above the base. The lower contact is drawn at the base of the first massive gray limestones resting on foliated siltite or argillite of the Gibson Jack Formation. Thickness decreases northward, and thin shaly limestone beds occur with greater frequency in the lower half of the unit in the Middle Fork Toponce Creek area. Thickness 640 m (2,100 ft)

€g GIBSON JACK FORMATION (LOWER CAMBRIAN)--Foliated siltite and argillite with interbeds of quartzite, sandstone, and conglomerate; highly variable in both color and grain size. Shaly beds predominate; coarser beds confined mainly to lower half of unit. Shales and argillites are dark-gray to grayish-green, locally micaceous. Sandstones and conglomerates are commonly tan to grayish-green. Basal conglomerates present in the Inkom Pass area. Unit is not easily subdivided into the members of Trimble (1976). Best exposures of a complete section, including a distinctive limestone (shown by short-dashes), occur in an upper thrust plate at Snow Peak. The limestone occurs a few hundred feet below the top of the unit as a single bed, 45-60 m (150-200 ft) thick, or as two thinner beds of dark-gray to black dense finely crystalline limestone which weathers to a distinctive bluish-gray. This limestone does not occur in rocks of the lower plate. Lower contact at top of uppermost massive fine-grained light-colored quartzite of Camelback Mountain Quartzite. Thickness 640 m (2,100 ft). Crittenden and others (1971, p. 587) assigned an Early Cambrian age to the Gibson Jack southwest of Pocatello, Idaho. The possibility of a Middle Cambrian age for part of the Gibson Jack in the Portneuf Range is suggested by a single poorly preserved trilobite cranidium (locality D2832-CO) collected about 1.5 m (5 ft) above the limestone unit. According to M. E. Taylor (written commun., Oct. 5, 1978) the cranidium is similar to Olenoides or Kootenia (Middle Cambrian), but too poorly preserved for definite identification

€cm CAMELBACK MOUNTAIN QUARTZITE (LOWER CAMBRIAN AND PRECAMBRIAN Z)--Medium- to fine-grained, white, pinkish-white, flesh-tan, and grayish-white vitreous orthoquartzite. Thick-bedded to massive, locally crossbedded. In Bonneville Peak-Snow Peak area, top locally characterized by distinctive gray to black quartzite. Basal part transitional with underlying Mutual Formation although distinctive white pebble conglomerate, 3 m (10 ft) thick is present in lower 15-18 m (50-60 ft) of unit in most places. Camelback Mountain Quartzite in Bonneville Peak-Snow Peak section in upper thrust plate more gradational with underlying Mutual Formation; light reddish colors and thin pebble conglomerate stringers present in lower part. Slight unconformity probable at base of unit west of Snow Peak. Thickness 305 m (1,000 ft) in most of map area; as much as 455 m (1,500 ft) in Bonneville Peak-Snow Peak sections

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This map is preliminary and has not been edited or reviewed for conformity with Geological Survey standards or nomenclature.

Zm MUTUAL FORMATION (PRECAMBRIAN Z)--Medium- to coarse-grained reddish-brown to red-purple quartzite and conglomerate and dark red to dusky red siltite and argillite in lower portion. Crossbeds are common, and quartzite locally is pebbly or conglomeratic. Upper part of unit commonly conglomeratic; conglomeratic portion increases considerably in thickness in Bonneville Peak-Snow Peak area. Locally, especially west of Inman Pass, the matrix is lighter red than is typical of unit. Lower contact placed at top of uppermost green argillites of Inkom Formation. Thickness 495 m (1,625 ft) at Inkom Pass

Zi INKOM FORMATION (PRECAMBRIAN Z)--Greenish-gray and green to light-olive, phyllitic micaceous and commonly massive argillite. In some areas, such as upper Webb Creek, unit also contains several feet of gray-green foliated conglomerate in basal portions. The lower contact is placed at the base of either the first greenish-gray argillite or gray-green conglomerate overlying the upper reddish quartzites of the Caddy Canyon Quartzite. Thickness 260-275 m (850-900 ft) in both Bonneville Peak and Inman Pass areas, but thickens where basal conglomerate is present

Zc CADDY CANYON QUARTZITE (PRECAMBRIAN Z)--Highly variable unit containing thick, dark-colored argillite, reddish quartzite, and minor dolomite and conglomerate. Where present (indicated by ---d---), the dolomite weathers to a distinctive buff to cream color, and tends to occupy a mid-unit position underlain and overlain by thinly bedded dark-gray to black argillites. At Webb Creek it forms two 15 m (50 ft) thick beds; north of Thirty Day Canyon it forms a single layer 60 m (200 ft) thick. Where the dolomite is absent, the Caddy Canyon is more coarse grained and major facies changes occur rapidly along strike. Basal and uppermost portions of the unit generally contain thick, massive, variably colored, but commonly reddish to red-brown vitreous quartzites. The Caddy Canyon Quartzite at Bonneville Peak, unlike that in other parts of the mapped area, consists entirely of massive, reddish-toned orthoquartzites nearly indistinguishable from quartzites of the Mutual Formation and Camelback Mountain Quartzite. The lower contact is concealed. Thickness more than 1,525 m (5,000 ft)

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