RECONNAISSANCE GEOLOGIC MAP OF THE PRESTON QUADRANGLE, SOUTHEASTERN IDAHO

By

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EXPLANATION

QUATERNARY

Holocene

Qal

Alluvium
Gravel, sand, and mud, well to poorly sorted, unconsolidated, mainly brown; in channel, flood-plain, and alluvial fan deposits

Qc

Colluvium
Unstratified unconsolidated angular rock fragments in hillwash and talus that grade into alluvium in tributary valleys

Qtu

Tufa
Calcium carbonate, porous to spongy, white, buff, and yellowish; deposited by mineralized springs

Qtg

Terrace gravel
Gravel, sand, silt, and mud, unconsolidated, mainly brown; contacts shown within areas mapped as terrace gravels are boundaries between different terrace levels

Pleistocene

Lake Bonneville Group

Qp

Provo Formation
Gravel and sand, unconsolidated, mainly brown; deposited along the periphery of Lake Bonneville during the Provo stage; grades basinward into pink silt and clay

Qpb

Pink silt
Silt, unconsolidated; deposited in deeper parts of Lake Bonneville probably mainly during the Alpine and Bonneville stages but possibly also during the Provo stage

Qba

Bonneville and Alpine Formations undifferentiated
Gravel and sand, unconsolidated, mainly pink; deposited along the periphery of Lake Bonneville during the Alpine and Bonneville stages; grades basinward into pink silt and clay

Qdm

Diamictite
Unconsolidated strikingly unsorted detrital deposits that range in size from clay and silt particles to blocks of mainly Swan Peak Quartzite, Brigham Quartzite, and Worm Creek Quartzite Member, but also locally of Fish Haven Dolomite and Garden City Limestone. Probably deposited in moraines, rock glaciers, landslides, and hillwash mainly during Bonneville time, for these deposits are graded to the Bonneville shoreline on the west side of the Bear River Range

Qbs

Bonneville-cut surface of Salt Lake Formation
Eroded surface of Salt Lake Formation cut by waves during the Bonneville stage

*Gentile Valley Group**

Qb

Gem Valley Basalt*
Dark- to very dark-gray fine- to medium-crystalline, vesicular, porphyritic, and coarsely crystalline massive olivine basalt; pillow basalt with palagonite rims is present locally; basaltic cinders

Qmc

Main Canyon Formation*
Silt, and marl, poorly consolidated, mainly very light gray; grades into sand and gravel near the margins of the Pleistocene Lake Thatcher in which they were deposited

Qmh

Hillwash and other colluvium
Unconsolidated unsorted angular rock fragments graded to the shoreline of the lake in which the Main Canyon Formation was deposited

TERTIARY

Pliocene

Tsl

Salt Lake Formation
Tuffaceous calcareous siltstone, claystone, sandstone, and conglomerate, very light gray to white; fine-grained rocks very thinly laminated to thin bedded, and coarser rocks in medium to thick beds and lenses; grades into diamictite near exposures of Paleozoic rocks. Some of these rocks may be older than Pliocene

CARBONIFEROUS — MISSISSIPPIAN

Lower Mississippian

Ml

Lodgepole Limestone
Limestone, medium-gray, thin- to medium-bedded; coarsely bioclastic and coquinoid to very finely crystalline limestone containing numerous layers of dark-gray chert. 650 to 850 feet thick where complete

DEVONIAN

Upper Devonian

Db

Beirdneau Formation
Upper part: thinly interbedded calcitic dolomite and dolomitic limestone that are finely laminated and light to dark gray; includes the "contact ledge limestone" of Williams (1948, p. 1141), a medium-bedded to massive gray aphanitic to finely crystalline cliff-forming limestone that contains some bioclastic layers, especially at top
Lower part: silty limestone, sandy limestone, calcareous quartz siltstone, and calcareous quartz sandstone in thin to medium, gray, tan, and pink beds; includes resistant layers of very light gray very finely crystalline limestone
850 feet thick

Middle and Upper Devonian

Dh

Hyrum Dolomite
Dolomite, thin- to medium-bedded, finely laminated, dark-blue-gray, weathering dull brown, finely to very finely crystalline, petroliferous-smelling; contains numerous beds of light-gray thin- to thick-bedded dolomite and some thin beds of light-gray subaphanitic limestone. Thins southward from 1,650 to 1,100 feet

Lower Devonian

Dwc

Water Canyon Formation
Upper part: medium-bedded medium-grained light-brown crossbedded sandstone
Lower part: light-gray medium- to thin-bedded very fine grained silty dolomite that weathers to grayish pink and orange pink.
About 360 feet thick

SILURIAN

Middle and Upper Silurian

Sl

Laketown Dolomite
Dolomite, very light- to medium-gray, weathering white, finely to very finely crystalline, in medium to thick beds; includes some coarsely crystalline beds and some coarsely bioclastic, largely coralline, beds. 1,040 to 1,340 feet thick

ORDOVICIAN

Upper Ordovician

Ofh

Fish Haven Dolomite
Dolomite, dark-gray, weathering dull brown, fetid, very finely to finely crystalline, thin- to medium-bedded; contains recrystallized ghosts of fossils and some silicified brachiopods; unit includes beds of very light gray dolomite and dark-gray chert; lower part may be Middle Ordovician. 450 feet thick

Middle Ordovician

Osp

Swan Peak Quartzite
Quartzite, buff, tan, pink, and light-gray, very fine- to fine-grained, well-sorted, medium-bedded to massive; some thin beds of red-weathering porous sandstone. Thins southeastward from 1,200 to 650 feet

Lower Ordovician

Ogc

Garden City Limestone
Dolomite, medium-crystalline, medium-gray; and dark-gray thin- to medium-bedded chert; grades downward into dark-gray thin- to medium-bedded limestone with coarsely bioclastic, oolitic, and intraformational conglomeratic beds and a few chert layers. 1,300 feet thick

CAMBRIAN

Upper Cambrian

Ꞓsc / Ꞓsw

St. Charles Limestone
Ꞓsc, upper part: dolomite, light- to medium-gray and brown, mostly medium-bedded but includes thin and thick finely crystalline beds, with layers of intraformational conglomerate and chert; includes an upper unit of thin- to medium-bedded dark-gray limestone with dolomite interbeds. Thins southeastward from 900 to 600 feet
Ꞓsw, Worm Creek Quartzite Member: vitreous quartzite and white to pink quartzitic arkose that form ledges and cliffs, grading downward to less resistant quartzite, sandy dolomite, dolomite, and arkosic quartzite. Quartzite and arkose are light gray, pink, and tan, medium to thick bedded, partly crossbedded, fine to medium grained; dolomite is light to medium gray, medium to thin bedded, finely to medium crystalline. Thins southeastward from 900 to 200 feet

Ꞓn

Nounan Limestone
Dolomite, medium- to light-gray and blue-gray, thin-bedded, medium to coarsely crystalline; includes units of banded thin- to medium-bedded dark-gray silty limestone, calcareous quartz sandstone, and limestone intraformational conglomerate. Thickens southeastward from 675 to 1,000 feet

Ꞓbo

Bloomington Formation
Mainly shaly micaceous green mudstone and claystone; some interbeds of buff and light-gray, tan- to brown-weathering, locally quartzitic siltstone and very fine grained sandstone. Oolitic limestone and silty limestone beds moderately abundant in upper part; aphanitic nodular and concretionary light-gray to pale-green limestone and partly oolitic, partly intraformational, conglomeratic limestone interbeds in middle and lower parts. Thins southeastward from 1,000 to 870 feet

Middle Cambrian

Ꞓbl

Blacksmith Limestone
Limestone, medium-gray to buff, mainly medium-thick-bedded, finely to coarsely crystalline; oolites are abundant in some beds, recrystallized fossil shell relicts in others; many of the thicker beds are thinly laminated. Thins southeastward from 900 to 725 feet but may, as mapped, include in some places thin-bedded limestones more properly assigned to the underlying Ute Limestone

Ꞓsh		Ꞓu
Ꞓll	Ꞓls	Ꞓld

Ute and Langston Formations and equivalent strata
Ꞓsh, shale: mainly green mudstone with interbeds of black mudstone and light- to medium-gray limestone; commonly has a basal unit of black claystone. Thins southeastward from 400 feet to interbeds in mainly carbonate units
Ꞓu, Ute Limestone: thin- to medium-bedded medium-gray limestone with silty mottles and layers and thin shale interbeds; silty layers weather pink, tan, and yellow. 300 to 500 feet thick
Ꞓll, limestone equivalent to the Langston Formation: mainly light- to dark-gray medium- to thick-bedded oolitic and Girvanella-bearing limestone with thin interbeds of green mudstone and locally, tan, sandstone that weathers red. 300 to 400 feet thick
Ꞓls, limestone and shale equivalent to the Langston Formation: variable proportions of limestone, like that in unit Ꞓll, and shale, like that in unit Ꞓsh, ranging from thinly interbedded to units of moderate thickness. 300 to 400 feet thick
Ꞓld, Langston Formation: dominantly very light gray thick-bedded to massive coarsely crystalline dolomite that weathers pale red to yellowish brown; includes units of thin-bedded very fine grained dark- to bluish-gray limestone and green mudstone. About 400 feet thick

CAMBRIAN – PRECAMBRIAN

Lower and Middle Cambrian / Upper Precambrian

ꞒpꞒb / pa

Brigham Quartzite
ꞒpꞒb, quartzite, poorly sorted, very fine to very coarse grained, partly conglomeratic, white, tan, buff, purple, pink, and gray; contains units of green, tan, and brown phyllite and phyllitic argillite in upper part and mainly gray schistose phyllite in lower part. About 10,000 feet thick
pa, purple argillite: thinly bedded and laminated reddish-purple and reddish-maroon micaceous argillite and quartzitic siltstone with some green and tan silt partings and green mottling. Argillite is about 350 feet thick 6,000 to 7,000 feet below the top of the formation

PRECAMBRIAN

Bannock Range rocks
Exposed at Little Mountain, northwest of Preston, and in the Bannock Range, west of the quadrangle. Neither the sequence nor the thicknesses of the units has been ascertained

ql

Quartzite and limestone
Mainly gray, pink, and green poorly sorted quartzite with thin units of dark-gray fine- to medium-grained medium-bedded limestone

q

Quartzite
Medium- to light-gray, pink, and green poorly sorted quartzite

md

Metadiabase
Medium to coarsely crystalline diabase with albitized plagioclase, hornblende, biotite, a matrix of chlorite and sericite, and clusters of radiating actinolite crystals

mg

Metagraywacke
Very poorly sorted detrital rock, ranging from muddy conglomerate to sandy mudstone with clasts of quartz, quartzite, feldspar, and diabase in a partly actinolitic matrix of chlorite, sericite, and, locally, epidote; sheared and mylonitized in places

s

Slate
Partly phyllitic dark- to greenish-gray slate composed of aforementioned matrix minerals

Contact
Approximately located

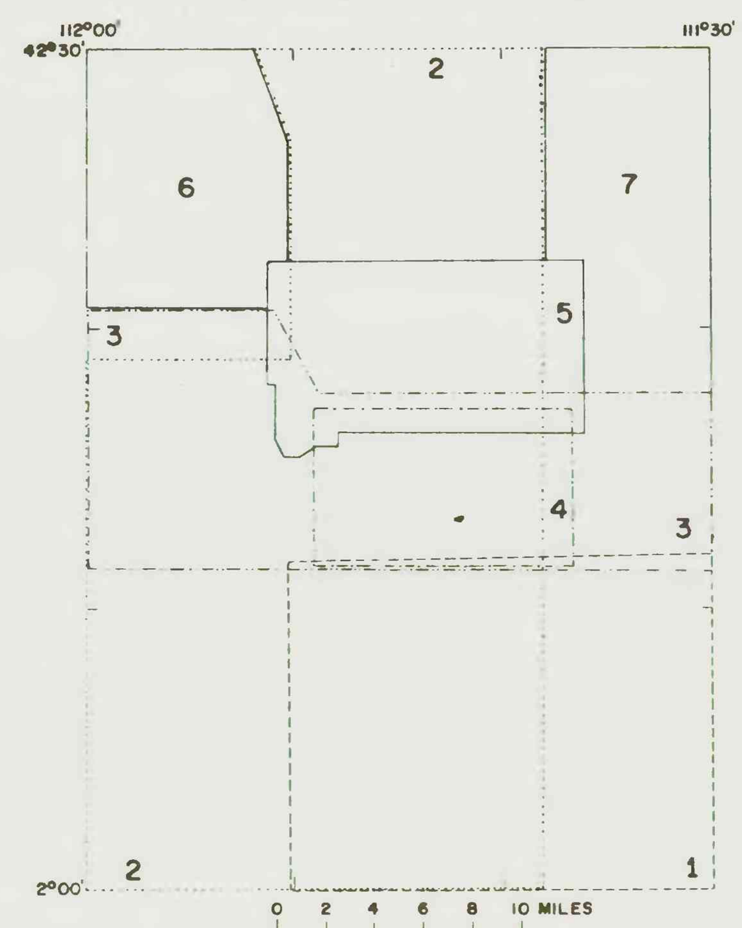
Fault
Approximately located. Dotted where concealed

25 Inclined — Vertical — Horizontal
Strike and dip of beds

Gravel pit

*Units newly defined by Bright (1967)

INDEX TO SOURCES OF DATA



1. Coulter (1956)
2. Bright (1963)
3. Keller (1952)
4. Keller (1952)
5. Bright (1960)
6. Reconnaissance by L. B. Platt
7. Reconnaissance by S. S. Oriel

REFERENCES CITED

Bright, R. C., 1967, Late-Pleistocene stratigraphy in Thatcher Basin, southeastern Idaho: Tebiwa (The Idaho State Univ. Mus. Jour.), v. 10, no. 1, p. 1-7.
______1963, Pleistocene Lakes Thatcher and Bonneville, southeastern Idaho: Minnesota Univ. (Minneapolis) Ph. D. thesis; available from University Microfilms, Inc., Ann Arbor, Mich.
______1960, Geology of the Cleveland area, southeastern Idaho: Utah Univ. unpub. M.S. thesis Salt Lake City, Utah.
Coulter, H. W., 1956, Geology of the southeast portion of the Preston quadrangle, Idaho: Idaho Bur. Mines and Geology Pamph. 107, 48 p.
Keller, A. S., 1963, Structure and stratigraphy behind the Bannock thrust in parts of the Preston and Montpelier quadrangles, Idaho: Columbia Univ. Ph.D. thesis; available from University Microfilms, Inc., Ann Arbor, Mich.
______1952, Geology of the Mink Creek region, Idaho: Utah Univ. unpub. M.S. thesis, Salt Lake City, Utah
Williams, J. Stewart, 1948, Geology of the Paleozoic rocks, Logan quadrangle, Utah: Geol. Soc. America Bull., v. 59, no. 11, p. 1121-1165.