DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

OPEN-FILE REPORT
79-709

Geology mapped, 1977-78, assisted by Peter R. Moon, 1977.

Geology in part of the Ogden River Canyon from Sorensen and Crittenden, 1972; position of Holocene faults along the Wasatch mountain front from Cluff, Brogan and Glass, 1979; surficial geology in Salt Lake Valley modified from Miller (written commun., 1979)

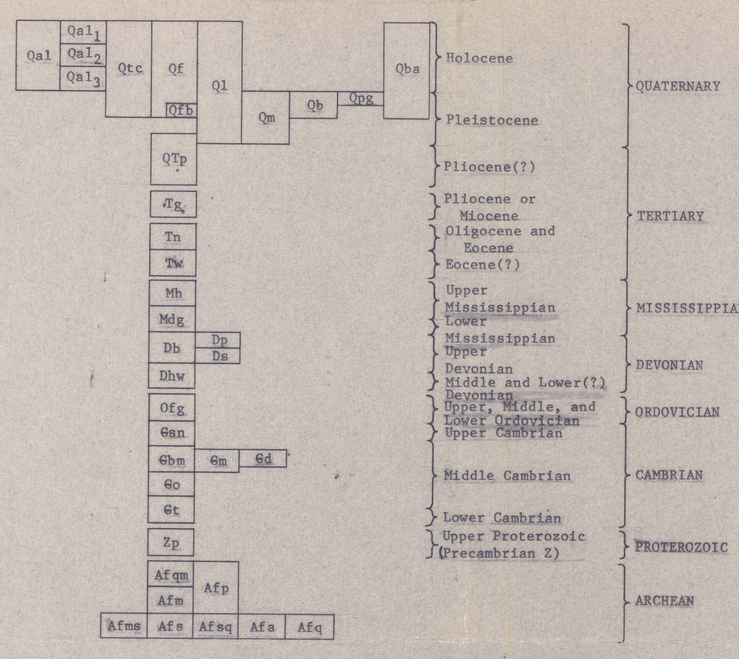



Index map showing location of U.S. Geological Survey quadrangles used for base map

U.S. Geological Survey
OPEN FILE REPORT
This map is preliminary and has not been edited or reviewed for conformity with Geological Survey standards.

SCALE 1:50 000
1 ½ 0 1 2 3 MILES
1 .5 0 1 2 3 KILOMETERS

## CORRELATION OF MAP UNITS




## DESCRIPTION OF MAP UNITS

Qal ALLUVIUM (HOLOCENE)--Sand, gravel and silt. $Qal_1$, $Qal_2$, $Qal_3$ are terraces along Weber River where it has incised rocks of the Lake Bonneville Group

Qtc TALUS AND COLLUVIUM (HOLOCENE AND PLEISTOCENE)--Angular pebbles, cobbles, and boulders with or without a matrix of silt and sand

Qf DEBRIS FAN DEPOSITS (HOLOCENE AND PLEISTOCENE)--Boulder gravel, sand and silt. Many deposits along east of range probably formed by outwash from glaciers in Pleistocene time

Qfb Fan deposits graded to high stand of Lake Bonneville (Pleistocene)

Ql LANDSLIDE DEPOSITS (HOLOCENE AND PLEISTOCENE)--Material ranging from boulders to silt in earthflows and debris slides

Qba ALLUVIUM, DEBRIS FAN DEPOSITS, AND LAKE BONNEVILLE GROUP (HOLOCENE AND PLEISTOCENE)--Mapped undivided in Weber Canyon

Qm TILL AND OUTWASH DEPOSITS (PLEISTOCENE) --Silt and sand containing many angular to rounded pebbles, cobbles, and boulders. Stippled pattern indicates prominent morainal ridges

Qb LAKE BONNEVILLE GROUP (PLEISTOCENE AND HOLOCENE)--Gravel, sand, silt, clay, and marl deposited in Lake Bonneville. Coarse gravel concentrated at shoreline along west edge of Wasatch Mountains

Qpg GRAVEL (PLEISTOCENE)--Gravel, sand, and silt forming terrace graded to Provo level of Lake Bonneville in Morgan Valley

QTp PEDIMENT GRAVEL (PLEISTOCENE OR PLIOCENE?)--Boulder gravel capping surface south of Weber River east of Wasatch Mountains

Tg GRAVEL (PLIOCENE OR MIOCENE)--Angular pebbles, cobbles, and boulders, sand, and silt. Rock types derived from nearby parts of Wasatch Range. Exposed southwest of the Farmington Canyon Complex. About 400 m exposed in map area

Tn NORWOOD TUFF (LOWER OLIGOCENE AND UPPER EOCENE)--White, and light-gray, and pale-green tuff, altered tuff, tuffaceous sandstone and conglomerate, and gray to reddish-brown clay. About 1,300 m exposed

Tw WASATCH FORMATION (EOCENE?)--Grayish-red to moderate-red sandstone, siltstone, conglomerate, and clay. Boulders in conglomerate to 1 m diameter mostly composed of Cambrian Tintic Quartzite and Precambrian quartzite. Gray conglomerate rich in limestone fragments in upper Cataract Canyon west of Hardscrabble Creek. 400 to 800 m thick

Mh HUMBUG FORMATION (UPPER MISSISSIPPIAN)--Dark-to light-gray medium-bedded dolomite with beds of medium- to fine-grained grayish-orange weathering light-gray sandstone and dolomitic sandstone. About 240 m exposed in map area north of Farmington Canyon Complex

Mdg DESERET AND GARDISON LIMESTONES, UNDIVIDED (UPPER AND LOWER MISSISSIPPIAN)--Total thickness about 200 m:

Deseret Limestone (Upper and Lower Mississippian)--fine to coarse grained dark to light gray dolomite and limestone with lenses of chert

Gardison Limestone (Lower Mississippian)--Upper part thick-bedded medium-gray dolomite with lenses of chert. Lower part thin- to medium-bedded, dark-gray to black, light-bluish- gray weathering fossiliferous limestone

Db BEIRDNEAU SANDSTONE (UPPER DEVONIAN)--Medium-bedded to laminated fine- to medium-grained sandstone, dolomitic sandstone, and dolomite; weathers grayish-orange to brown. About 75 m thick. Mapped north of the Farmington Canyon Complex. Tectonically thickened south of Sardine Canyon

Dp PINYON PEAK LIMESTONE (UPPER DEVONIAN)--Fine-grained thin-bedded yellowish gray and pinkish gray weathering limestone, silty shale and silty limestone. Mapped south of the Farmington Canyon Complex. About 105 m thick on Sessions Mountains. Apparent thickness of 200 m on Hardscrabble Creek may be due to tectonic thickening

Ds STANSBURY FORMATION (UPPER DEVONIAN)--White to yellowish-gray thin-bedded sandstone with a few grayish-orange to moderate-red weathering beds of silty sandstone; yellowish-gray weathering siltstone, and silty dolomite. At bottom gray dolomite with interbeds of silty dolomite and sandstone. About 105 m thick. Mapped south of the Farmington Canyon Complex. Unconformity at base

Dhw HYRUM DOLOMITE AND WATER CANYON(?) FORMATION, UNDIVIDED (UPPER, MIDDLE, AND LOWER DEVONIAN)--Thin- to thick-bedded, fine- to medium-grained dark-gray to black, dark- to light-gray weathering dolomite. Some beds of light- grayish-orange weathering silty dolomite and dolomitic siltstone in upper part. At base thinly laminated light-gray and dark-gray dolomite in 1-2 m beds may represent Water Canyon Formation. About 105 m thick. Unconformity at base

Ofg FISH HAVEN DOLOMITE AND GARDEN CITY FORMATION, UNDIVIDED (ORDOVICIAN)

Fish Haven Dolomite (Upper Ordovician)--Medium- to thick-bedded, fine- to medium-grained, medium- to pale-gray dolomite. About 50 m thick. Unconformity at base

Garden City Formation (Middle and Lower Ordovician)--Thin- to medium-bedded, medium- to pale-gray and very pale orange, grayish-orange weathering dolomite, commonly with sandy streaks and lenses. Interbedded thinly laminated, medium gray to yellowish-gray, grayish-orange weathering siltstone. About 100 m thick

Єsn ST. CHARLES FORMATION AND NOUNAN DOLOMITE, UNDIVIDED (UPPER AND MIDDLE CAMBRIAN):

St. Charles Formation (Upper Cambrian): Dolomite member--thin- to thick-bedded fine- to medium-grained, white to light-gray dolomite. About 200 m thick

Worm Creek Quartzite Member--Thin bedded fine- to medium-grained medium-gray sandy dolomite with shale partings. About 2 m thick

Nounan Dolomite (Upper and Middle Cambrian) Thin- to thick-bedded, fine-grained light- to medium-gray dolomite. About 100 m thick

Єbm BLOOMINGTON FORMATION AND MAXFIELD LIMESTONE, UNDIVIDED (MIDDLE CAMBRIAN):

Bloomington Formation--Olive-green to light-brown shale and light- to dark-bluish-gray limestone with intercalated pale-yellowish-orange to dark-yellowish-orange silty limestone; intraformational conglomerate common. About 50 m thick

Maxfield Limestone--Total thickness about 240 m in south part of area; 650 m in north: Upper part--Thin-bedded fine-grained medium- to dark-gray dolomite with intercalated light-gray silty limestone

Middle part--Olive-green micaceous shale and medium- to dark-gray limestone

Lower part--Dark-blue-gray, light-gray weathering limestone and dolomite with light- grayish-orange silty limestone intercalated as lenses and thin beds

Єm MAXFIELD LIMESTONE (MIDDLE CAMBRIAN)

Єd DOLOMITE (MIDDLE CAMBRIAN)--Thick- to thin-bedded light- to dark-gray dolomite. Mapped east of Hardscrabble Creek. Probably is the upper part of the Maxfield Limestone. About 100 m exposed

Єo OPHIR FORMATION (MIDDLE CAMBRIAN)--Approximate stratigraphic thickness 150-200 m; much tectonic thinning and thickening:

Upper part--Thin-bedded light-blue-gray limestone, shaly limestone, and light- greenish-gray to olive-gray shale

Middle part--Fine-grained medium-blue-gray weathering limestone with lenses of light-grayish-brown weathering silty limestone.

Lower part--Light-brown to olive-green micaceous shale and phyllite.

Єt TINTIC QUARTZITE (MIDDLE AND LOWER CAMBRIAN)--Very pale orange to grayish-orange weathering medium- to coarse-grained thin- to thick-bedded white quartzite. Abundant cross bedding. Lenses and beds of quartz pebble conglomerate in lower part, especially at base. About 450 m thick north of the Farmington Canyon Complex and about 600 m thick south of the complex

Zp FORMATION OF PERRY CANYON (PRECAMBRIAN Z)--Pale-grayish-orange weathering micaceous meta-arkose and quartzite and greenish-gray phyllite near Willard thrust. Graywacke and micaceous siltstone elsewhere (Sorensen and Crittenden, 1974). About 150 m exposed in map area

Afqm FARMINGTON CANYON COMPLEX (ARCHEAN):[1/]

Quartz monzonite gneiss--White to light-gray, pinkish-gray to yellowish- gray-weathering, fine- to medium-grained biotite-hornblende quartz monzonite gneiss containing some lenses of greenish-black amphibolite. Contains sparse to abundant white to pinkish-gray pegmatite veinlets and stringers 1-10 cm thick with sharp to indistinct borders. Lenses and pods of amphibolite generally are 0.5 to a few meters thick and a few to tens of meters long

Afm Migmatite--Interlayered and intergradational white to light-gray biotite-hornblende quartz monzonite gneiss, gray biotite-garnet-feldspar-quartz schist and gneiss, white garnet-quartz feldspar gneiss, greenish-black amphibolite, medium-gray garnet-biotite schist and sillimanite-garnet-biotite schist. Lenses and layers of white to pinkish-gray pegmatite 1-10 cm thick, some with indistinct and some with sharp borders, abundant and commonly discordant, larger, more sharply bounded, pegmatites 1-10 m thick. Contacts with Afqm and Afs gradational

Afp Pegmatite--White, very light gray to very pale orange plagioclase-quartz-microcline and quartz-microcline pegmatite locally containing muscovite or biotite books to several cm in diameter. Only a few of the largest bodies mapped

Afms Mica schist--Medium-gray muscovite-biotite- plagioclase-quartz schist with micas as much as 5 mm in diameter. Contains some amphibolite and poorly foliated meta-diorite. Mapped in lower Waterfall Canyon and Strong Canyon in northwest part of map area

Afs Schist and gneiss--Light- to medium-gray biotite-feldspar-quartz gneiss, garnet-biotite-feldspar-quartz gneiss, sillimanite-biotite schist, sillimanite-garnet-biotite schist and gneiss, hornblende-biotite schist, and less abundant layers of white, coarse-grained quartzite. Lenses and layers of amphibolite. Pegmatite dikes and sills; some with indistinct and others with sharp borders; pegmatites with sharp contacts cut those with indistinct contacts and tend to be discordant. Sharply bounded discordant pegmatites more abundant in this unit than in Afm to north and are generally 10-30 m long, but a few are as much as several hundred meters long

Afsq Schist, gneiss and quartzite--Light- to medium- gray biotite-feldspar-quartz schist, sillimanite-biotite schist, sillimanite-garnet-biotite schist and gneiss, and layers of coarse grained quartzite as much as 10 m thick. Quartzite is white to pale yellowish green, has a grain size of 4-5 mm; contains some light-green muscovite and has a few heavy mineral partings. Amphibolite in lenses and layers

Afa Amphibolite--Greenish-black generally nonlayered hornblende-plagioclase amphibolite; only a few of the largest bodies mapped. Occurs as lenses 0.5 m to 10 m thick throughout Farmington Canyon Complex. Some rocks contain monoclinic pyroxene, especially in northern part of area, and some contain quartz. Some rocks have aggregates of plagioclase suggesting former porphyritic textures.

Afq Quartzite--Light- greenish-gray to light-gray, grayish-red and dark-gray quartzite, hematite quartzite, sericite quartzite, chlorite-epidote-sericite quartzite. Occurs as inclusions in quartz monzonite gneiss

CONTACT--Dashed where gradational
FAULT--Dotted where concealed. Bar and ball on downthrown side
THRUST FAULT--Dotted where concealed. Teeth upper plate
STRIKE AND DIP OF BEDS
Inclined
Vertical
STRIKE AND DIP OF FOLIATION
Inclined
Vertical
STRIKE AND DIP OF FOLIATION AND COMPOSITIONAL LAYERING
Inclined
Vertical
STRIKE AND DIP OF CATACLASTIC FOLIATION AND FOLIATION IN RETROGRESSIVELY METAMORPHSED ROCK
Inclined
Vertical
BEARING AND PLUNGE OF MINERAL LINEATION May be combined with foliation symbols
Inclined
Horizontal

OCCURRENCE OF METAMORPHIC INDEX MINERALS AND MINERAL ASSEMBLAGES--Fragmentary evidence indicates lowest grade in southern part of area

S Megascopically determined
Sillimanite
Microscopically determined
S Sillimanite
SMU Sillimanite and muscovite
SM Sillimanite and microcline
SMM Sillimanite, microcline, and muscovite
H Relict hypersthene
Ś AREA OF SHEARED AND RETROGRESSIVELY METAMORPHOSED ROCK--Much of the rock is sheared to phyllonite, mylonitic gneiss, mylonite, and silicified blastomylonite and is retrogressively metamorphosed. Chlorite, epidote, and albite are charcteristic new minerals. Boundaries of areas of sheared rock are indistinct and indicated by dotted lines; small areas and thin elongate zones of sheared and retrogressively metamorphosed rocks occur outside mapped areas; some lenses of rock inside these areas have escaped shearing and retrogressive metamorphism

### References

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Sorensen, M. L., and Crittenden, M. D., Jr., 1972, Preliminary geologic map of part of the Wasatch Range near North Ogden, Utah: U.S. Geological Survey Miscellaneous Field Studies Map MF-428.

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[1/] Preliminary results of Rb/Sr studies by C. E. Hedge indicate that the migmatites in Canyon are 2600-2900 m.y. old.

# RECONNAISSANCE GEOLOGIC MAP OF THE PRECAMBRIAN FARMINGTON CANYON COMPLEX AND SURROUNDING ROCKS IN THE WASATCH MOUNTAINS BETWEEN OGDEN AND BOUNTIFUL, UTAH

By
Bruce Bryant
1979

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