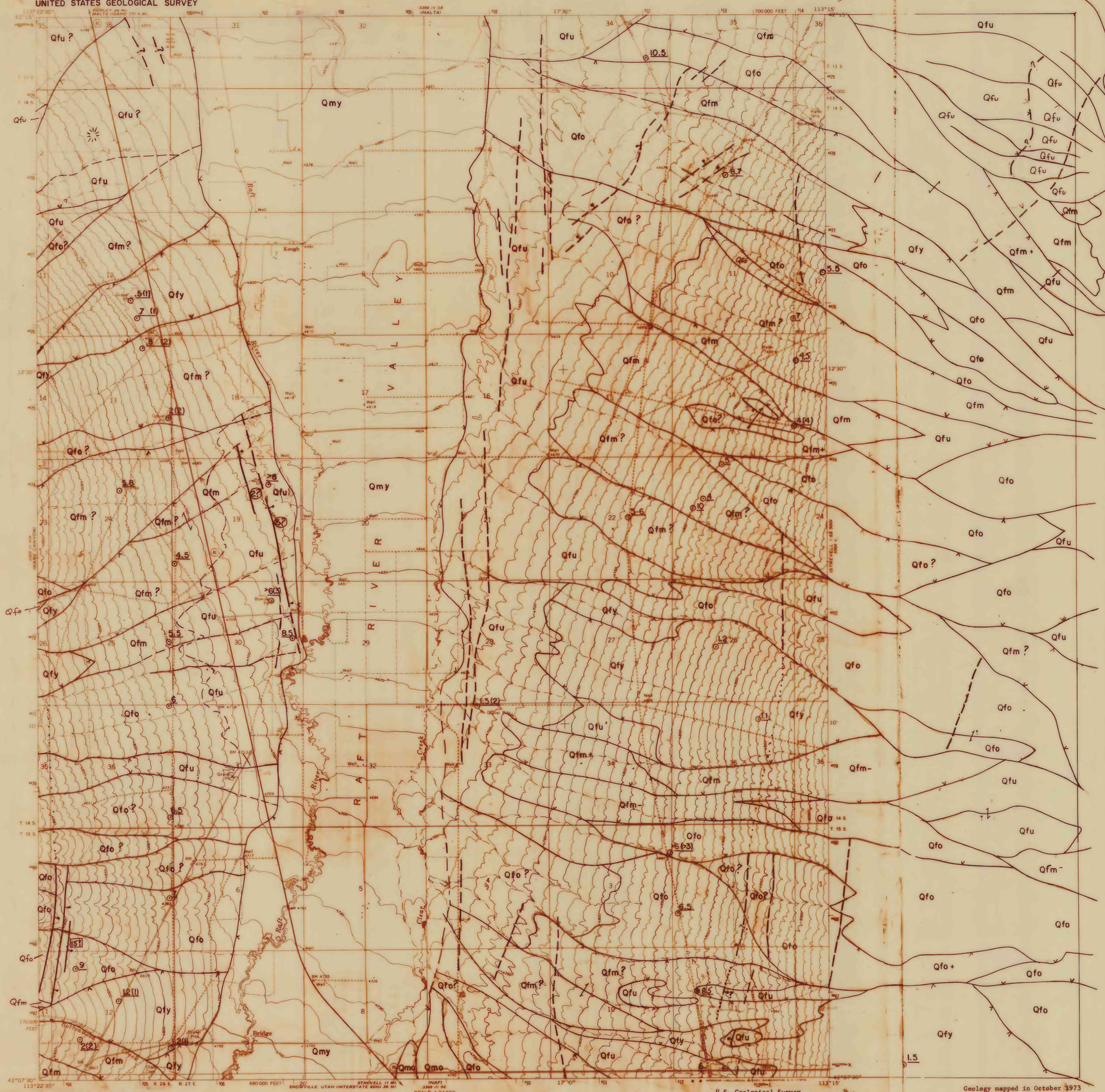


Base from U.S. Geological Survey, Bridge, 1968

SCALE 1:24 000

CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL

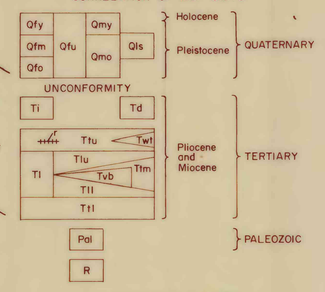
UTM GRID AND 1968 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

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

IDAHO
QUADRANGLE LOCATION

Geology mapped in October 1973

CORRELATION OF MAP UNITS



DESCRIPTION OF MAP UNITS

FAN ALLUVIUM (PLEISTOCENE):

Qfy Younger--Sheets of medium to fine gravel on piedmont slopes; moderately well sorted, imbricated, indistinctly bedded, local openwork texture. Clasts are subangular to subrounded; rounding increases with distance from range source. Fans from Jim Sage Mountains composed of clasts of reddish-brown lava, black glassy lava, and white tuff; fans from Raft River Range composed mostly of clasts of metamorphic rocks and limestone; fans from Black Pine Range composed of clasts of limestone, sandstone, chert, and mudstone. Thickness of individual depositional units mainly 5 to 15 feet (2-5 m). Overlies older fan gravels in most places; interbeds of weathered loess preserved between gravel sheets. Fan surfaces are smooth and undissected and show shallow depositional channels. Mantled by about 1.2 feet (0.4 m) of loess (wind-blown silt). Weak B-horizon 6 inches (15 cm) thick developed in loess with weak carbonate zone (Cca soil horizon) at base of silt and in upper part of gravel. Gravel deposited mostly during last pluvial episode when the nearby Bonneville basin contained a deep lake. Loess thickness and soil development similar to that on pluvial Lake Bonneville gravel deposits and on local outwash of Pinedale glaciers from the Raft River Range, to the south.

Qfm Middle--Similar to younger fan alluvium (Qfy) but moderately dissected. Fans on lower slopes of piedmont mantled by loess about 2 to 5 feet (0.6-1.5 m) thick displaying evidence of from 2 to 3 cycles of loess deposition and weathering. Inferred to have been deposited primarily during the last 2 to 3 pluvial episodes.

Qfo Older--Similar to younger fan alluvium (Qfy) but well dissected. On middle and lower parts of piedmont, uneroded interfluve areas mantled by more than 5 feet (1.5 m) of loess displaying evidence of more than 4 loess deposition-weathering cycles. Inferred to have been deposited more than 3 pluvial episodes ago.

Qfu Undivided--Either a composite of fan deposits of different ages or age not determined. Similar otherwise to younger fan alluvium (Qfa). Includes slopewash and colluvium adjacent to mountains.

ALLUVIUM OF MAJOR DRAINAGES (PLEISTOCENE):

Qmy Younger--Sheets of medium gravel along major drainages between ranges. Occurs in belts much wider than meander belt of present streams which appear to be underfit. Gravel mantled by 5 to 15 feet (1.5-5 m) of silty alluvium inferred to be recycled loess eroded from ranges and fans. Surface of silt smooth and undissected. Gravel inferred to have been deposited during last Pleistocene pluvial episode and silty alluvial mantle since then, during the Holocene.

Qmo Older--Similar to younger alluvium (Qmy) but more dissected.

Qls LANDSLIDE DEPOSIT--Mapped only near northern end of Jim Sage Mountains.

Tl INTRUSIVE ROCKS ALONG SOUTHEAST MARGIN OF COTTRELL RANGE (PLIOCENE? AND MIOCENE)--Brown-weathering gray and grayish-purple rock, commonly platy, containing less than 10-percent phenocrysts of plagioclase and pyroxene; may be brecciated and silicified along marginal contacts. Rock indistinguishable from lava, indicating that these intrusions were emplaced at very shallow level. Body north of Rice Spring has produced elliptical doming of adjacent tuff and lava units.

Td VOLCANIC DOMES OF SHEEP MOUNTAIN AND ROUND MOUNTAIN AREAS (PLIOCENE? AND MIOCENE)--Sheep Mountain is a dome with partly eroded marginal zone of brown silicified brecciated lava surrounding a core of complexly fractured, irregularly altered, locally brecciated lava. Present locally are relict patches of unaltered glassy rock with about 10-percent feldspar and pyroxene phenocrysts as large as 2 mm. A silicified, brecciated dike extends southeastward from the eastern margin of the dome. Silicified thin-bedded tuff float adjacent to the dike suggests that tuff may occur marginal to, and/or beneath the dome. Body northeast of Sheep Mountain contains dark-brown-weathering black glass with feldspar phenocrysts as large as 4 mm; it is inferred to be dome because of proximity to Sheep Mountain and similarity of glassy rocks. Body north of Sheep Mountain may be top of another dome, but clear-cut evidence is lacking. Round Mountain dome(?) consists of black vitrophyre with about 10-percent plagioclase and minor pyroxene.

ROCKS OF JIM SAGE AND SOUTHERN COTTRELL MOUNTAINS (PLIOCENE? AND MIOCENE):

Ttu Upper tuff unit--Pale-gray and white massive to thin-bedded weakly indurated tuffaceous sandstone, siltstone, conglomerate and shale. Locally altered to pale-green rock that weathers pale yellow. Conglomerate beds several meters thick make up about 10 percent of the succession and consist of subrounded pebbles and cobbles as much as 10 cm in diameter of quartzite, limestone, and chert, with minor volcanic, acidic plutonic, and metamorphic rocks, in a sand matrix. Siltstone contains ostracods and leaf impressions. Of lacustrine and fluvial origin. Total thickness probably 3,300-6,600 feet (1,000-2,000 m) or more.

Twt Dark-gray densely welded ash-flow tuff vitrophyre--Lithophysal zone 1 m thick in middle. About 10 feet (3 m) thick; only known exposures are at Cedar Knoll.

Intercalated rhyolite(?) vitrophyre lava flows --A few meters thick in lower part of unit.

Tlu Upper lava flows--Porphyritic dark-gray to black columnar vitrophyre flows and red-brown platy aphanitic-porphyritic devitrified flows, probably of rhyolitic composition, ranging in thickness from 15 to 130 feet (5 to 40 m). Vitrophyric breccia also present east of Red Rock Mountain. Phenocrysts make up 5 to 30 percent of the rock and are mostly plagioclase with minor quartz and pyroxene. Most flows have normal magnetic polarity; total thickness 330-1,000 feet (100-300 m).

Ttm Middle tuff unit--Light-gray and white weakly indurated tuffaceous sandstone, shale and siltstone. Lateral equivalent of vitrophyre breccia (Tvb); also overlies that unit in places; especially prominent at Red Rock Mountain and in lower Jim Sage Canyon; where thin, not mapped separately from the vitrophyre breccia. Thickness 0-330 feet (0-100 m).

Tvb Vitrophyre breccia--Massive and very thick bedded breccia consisting of angular clasts of dark-gray and black porphyritic rhyolite(?) vitrophyre, ranging in size from a few mm to 1 m, in a grayish-yellow hydrated glass matrix. Contains intercalated rhyolite(?) vitrophyre flows a few meters thick. Total thickness of unit 0-760 feet (0-230 m).

Tll Lower lava flows--Porphyritic dark-gray to black columnar vitrophyre flows and reddish-brown and gray platy porphyritic-aphanitic devitrified lavas, probably rhyolitic, ranging in thickness from 33 to 165 feet (10 to 50 m). Thick devitrified flows commonly display distinctive reddish-brown concentric color bands that resemble liesegang rings. Most flows are magnetically reversed; liesegang-banded flows commonly have weak normal polarity that may not be thermoremanent. Phenocrysts are mostly plagioclase feldspar and subordinate quartz and pyroxene. Total thickness 330-1,000 feet (100-330 m).

Tl Lava flows undivided--Where the vitrophyre breccia (Tvb) is absent, chiefly in Cottonwood Creek area, lower and upper flows are not mapped separately.

Ttl Lower tuff unit--Light-gray to white weakly indurated tuffaceous siltstone, shale, and fine- to medium-grained sandstone; sparse thin conglomerate beds containing rounded chert and quartzite pebbles as much as 2 inches (5 cm) in diameter occur near the top. Siltstone and shale mainly thin bedded; sandstone thin bedded to massive, in part cross-bedded. Calcareous cement occurs in some beds, and forms concretions near the top. Fossil leaves and ostracods have been found at several horizons. Along upper Cottonwood Creek rocks are pale green (weather pale yellow), probably reflecting hydrothermal alteration. Lacustrine and fluvial origin. Greatest exposed thickness is 400 feet (130 m); may be as thick as 3,300 feet (1,000 m).

Pal PALEOZOIC ROCKS

R BEDROCK

CONTACT--Dashed where inferred; queried where very uncertain. Carets on alluvial fan contacts are on side of younger fan; barbed line indicates approximate age equivalence.

70 (10) [15] FAULT, SHOWING DIP--On alluvial fans, dashed where inferred from aerial photographs but not verified on ground, and may therefore indicate a buried fault or fracture with little or no offset at surface; dotted where concealed and no surface offset noted; queried where doubtful. Circled number indicates amount of offset of alluvial surfaces on single fault; boxed number indicates total offset on sets of faults. Bar and ball on downthrown side; arrows show direction of relative strike-slip movement.

STRIKE AND DIP:

Sedimentary beds and layering in lava flows.

Approximate strike and direction of dip of lava flow.

THICKNESS OF LOESS MANTLE--In feet.

8.5 >5 >5 indicates thickness of loess mantle observed in surface exposure.

(3) INFERRED NUMBER OF CYCLES OF DEPOSITION AND WEATHERING OBSERVED IN LOESS THAT MANTLES GRAVEL

HOT-WELL LOCATION

NORTHEASTERN PART

PRELIMINARY GEOLOGIC MAP OF THE SOUTHERN RAFT RIVER AREA, CASSIA COUNTY, IDAHO

By
Paul L. Williams, Kenneth L. Pierce, David H. McIntyre, and Paul W. Schmidt

1974