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rry Reservoir 30 km east
r geothermal potential.
lled for mineral explo-
s cover a distance of about
heat flow values range from
over 7μcal/cm^{2}sec.
tonites, tuffaceous sand-
st and overlie folded
zoic rocks crop out 150 to
th-northwest trending
lect a major deep-seated
f the Paleozoic outcrop
aleozoic rocks and may
alous drill holes lie
rsection with the east
cedony, and minor fluorite
Tertiary rocks.
he drill holes indicates a
ed by dilution from shal-
al anomaly may be water
c aquifers or faults and
ervoir potential may exist
y beds. Thus, the area
ssessment of the geo-

OF ASH-FLOW TUFFS
and Mineral Resources,
ary R., Department of
e University, Cape

ing and visible stratifi-
roducts of turbulent flow.
le degree of preferred
and some exhibit mega-
Swanson, 1967). This
ics of transportation and
. Fisher (1966) presented
ed turbulent flowage and
ndary layer. We suggest
inar and that the resultant
sage of many individual

ar flow structures depends
s entering the boundary
temperature. If above, the
form a viscous fluid with
f below, the particles fail
flow in loose ash. In the
after deposition as in-
welding temperature to, or
s. Thus, there are both
ained at the rolling front
ay be trapped in the bound-
pockets ("lenticules",
ice cavities.

SEQUENTIAL DEVELOPMENT OF LAMINAR FLOW STRUCTURES IN THE WALL MOUNTAIN TUFF, CENTRAL COLORADO

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The Wall Mountain Tuff (Oligocene) developed a eutaxitic fabric and laminar flow structures during the transition from turbulent flow to rest state in a laminar boundary layer. This conclusion and the following sequence of events are interpreted from exposures in a paleovalley where the transport vector is known: 1)agglutination and incipient collapse of glassy particles; 2)laminar shearing of the compacting and welding mass to form a primary flow foliation; 3)expulsion of gases from the collapsing, spongy mass and concentration of these gases along shear planes; 4)formation of gas pockets where the volume of gases expelled exceeded that which could be accommodated on shear planes; 5) elongation of gas pockets and pumice to form a lineation in the plane of the foliation; 6)formation of gas flotation planes on shear planes which accumulated unusually large volumes of gases; 7)development of primary flow folds with axes perpendicular to the lineation; 8)stretching of the completely collapsed, densely welded, highly viscous fluid with formation of tension cracks that dip steeply "downstream" and strike approximately perpendicular to the lineation; 9)end of forward motion. Preservation of delicate primary structures permits no secondary compaction.

More rapid deposition along the sides of the paleovalley than along its axis caused inward accretion of tuff with steep primary flow foliation resulting in a u-shaped channel cross profile. Secondary folds, whose axes parallel the lineation, and concurrent growth faulting occurred locally by creep towards the valley axis. Internal unconformities are visible where less deformed tuff overlies either primary or secondary folds. All the tuff welded together to form a simple cooling unit.

ORIGIN AND GEOTHERMAL POTENTIAL OF ISLAND PARK, EASTERN IDAHO

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Island Park is a topographic basin of compound origin related to the three rhyolitic cycles of the Yellowstone Plateau volcanic field. Big Bend Ridge, the southwestern rim of Island Park, bounds a segment of the first-cycle caldera, which formed by collapse during the Huckleberry Ridge Tuff eruption 1.9 m.y. ago and which extended 90 km eastward into Yellowstone National Park. Thurmon Ridge, the northwestern rim of Island Park, bounds part of a second-cycle caldera 20 km across that formed 1.2 m.y. ago as a result of the Mesa Falls Tuff eruption and is nested within the older caldera. This collapse event reactivated caldera faults on Big Bend Ridge. The rest of the first- and second-cycle calderas are buried by the third-cycle 0.6 m.y.-old Lava Creek Tuff and younger volcanic rocks. The eastern rim of Island Park is not a caldera scarp but is formed by large rhyolite flows of the third cycle. These flows all vented on the Madison Plateau farther east.

The youngest major rhyolitic eruptions at Island Park occurred about a million years ago. Subsequent solidification of the rhyolitic magma bodies that sustained the first two cycles allowed tectonic fracturing of the resulting plutons and eruptions of mantle-derived basaltic magma through the caldera floor during the last 300,000 years. Because no major silicic magma body now lies beneath Island Park, a high-temperature geothermal system similar to Yellowstone is not likely. The granitic plutons are still cooling, however, and a lower-temperature geothermal resource might exist at moderate depth.

GEOLOGIC SECTION ACROSS CENTRAL SONORA, MEXICO.

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A 280 km long section, oriented SW-NE from Bahia Kino through Hermosillo and Moctezuma, straddles the Sonoran Desert Province (Raisz, 1959) on the west, and the northward continuation of King's (1939) Province of Parallel Ranges and Valleys to the east.

Structurally, the ranges are uplifts, many bordered by parallel faults, that expose volcanic and batholithic rocks at their crests and in their cores. Laramide and Middle-to-Late Tertiary tectonic events contribute much to the present landscape.

Comparison with adjacent areas reveals that the oldest rocks are metamorphosed and deformed sediments of Paleozoic age unconformably overlain by the lowermost (?) Tertiary volcanic units. Widespread emplacement of plutons, commonly near granodiorite in composition, are displayed in a zone of dispersed and elongated batholiths ranging in age from Late Cretaceous to Early Tertiary (Anderson and Silver, 1974). Post batholith units include a swarm of basic dikes, best displayed 90 km east of Hermosillo in a major pluton. The Late Tertiary (? Pliocene) Baucarit Formation, consisting of basalt and conglomerate, unconformably overlies the plutonic and Tertiary volcanic units, forming the flanks and fill of intermontane basins. The latest flows are basalts that overlie valley fill. Alluvium and gravel of Quaternary age cover much of the surface from Hermosillo to the coast between isolated ridges of Tertiary volcanic rock.

THE INFLUENCE OF ROCK ALTERATION ON RIVER BASIN GEOMORPHOLOGY IN THE SOUTHERN IDAHO BATHOLITH

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An analysis of two major drainage basins in the southern Idaho batholith reveals a strong influence of rock alteration on their morphologic characteristics. The Middle Fork of the Payette River and the North Fork of the Boise River have similar drainage areas and total drainage discharges. Both drainages are developed on similar rock types: the quartz diorites, granodiorites, and quartz monzonites of the Idaho Batholith. Geomorphologic characteristics of the two basins, however, differ markedly.

Granitic wall rock within a 30-mile long portion of the drainage of the Middle Fork of the Payette River is characteristically sheared and argillized. Wall rock alteration along the drainage of the North Fork of the Boise is less pervasive, and argillation is localized. This reflects a generally high angle of intersection between the river valley and the structurally controlled tributary drainages. Drainages paralleling major argillized linear trends, such as the Middle Fork of the Payette, tend to develop wider valleys with gently sloping canyon walls. Drainages perpendicular to linear trends, such as the North Fork of the Boise River, exhibit steeper canyon walls with a larger proportion of exposed fresh bedrock.

These differences influence the type of ma
inate in the drainages and are especially appl
slope failures. Within the more or less conti
of the Middle Fork of the Payette, landslides
failure and present a continuing road maintena
road of the North Fork of the Boise is more su
falls. These differences should be considered
construction.

TEPHRA DEPOSITS IN THE CENTRAL IDAHO BATHOLITH

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Soils containing a thin, discontinuous ash lay
gently sloping upland sites in the central Ida
deposits have not been radiometrically dated,
(post-Pleistocene) on the basis of stratigraph
mental data. There is some indication of more
soil horizon mixing has obscured positive iden
one tephra without more detailed sampling. Th
within the reported fallout zone of both Mazam
falls, but position of the ash deposits in the
refractive index of the glass indicate these a
Presence of cummingtonite phenocrysts coupled
St. Helens as a possible origin. Soil managem
with these ash deposits are discussed.

INTERPRETIVE GEOLOGIC CROSS SECTIONS ALONG GR
GREAT SALT LAKE, UTAH

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During 1968, a reconnaissance gravity survey
Salt Lake, Utah was made with a LaCoste and R
in a joint project by the Army Topographic Co
cal and Mineral Survey (Cook, Iverson, and St
gravity data from this survey and surveys alo
and the Southern Pacific Railroad causeway ac
others, 1966), four interpretive east-west ge
across the lake were compiled. Using an ass
trast of 0.5 gm/cc between the Cenozoic and
maximum thicknesses of the Cenozoic rocks al
files, taken at the following approximate la
3,600 feet, in the area west-northwest of Ro
(along the causeway)--7,000 feet, in the are
Lakeside; (C) 40° 57'--7,600 feet, in the ar
Island and Antelope Island; and (D) 40° 50'-
midway between Stansbury Island and Antelope
or smaller density contrast would result in
larger thicknesses, respectively. The gravi
northward-trending Great Salt Lake graben is
comprises at least two separate Cenozoic bas
by gravity lows) which are divided by a stru