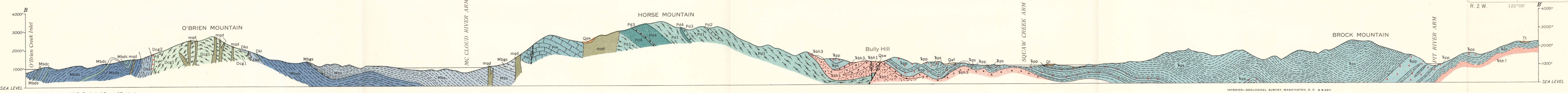
UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY



Topographic base from U. S. Geological Survey 15 minute quadrangle maps enlarged to present scale by photographic methods

INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D. C. M R-3311

Geology by John P. Albers and Jacques F. Robertson, 1949–1952

GEOLOGIC MAP AND SECTIONS OF THE EAST SHASTA COPPER-ZINC DISTRICT, SHASTA COUNTY, CALIFORNIA

Scale 1:24 000

1 0 1 2 3 Miles

Contour interval 40 and 50 feet
Datum is mean sea level

EXPLANATION

QUATERNARY — Pleistocene and Recent

Qal Qls Qt Qaf Qsw

Unconsolidated deposits
Qal, *alluvium;* Qls, *landslide debris;* Qt, *terrace deposits;* Qaf, *alluvial fan deposits;* Qsw, *slope wash or colluvium, mapped only where bedrock is effectively obscured*

UNCONFORMITY(?)

TERTIARY OR QUATERNARY — Pliocene or Pleistocene

QThb QTab QTdb

Basalt
QThb, *medium-gray, porphyritic, hypersthene augite basalt;* QTab, *dark-gray, fine-grained augite basalt;* QTdb, *diabase*

UNCONFORMITY(?)

TERTIARY — Pliocene

Tt

Tuscan formation

UNCONFORMITY

JURASSIC(?) OR CRETACEOUS(?)

dp

Dacite porphyry
Known locally as birdseye porphyry because of the conspicuous large zoned plagioclase phenocrysts

mqd

Mafic quartz diorite, diorite, and metadiabase, undifferentiated

aqd

Augite quartz diorite
Includes minor granodiorite

ir a

Igneous rocks of the Pit River stock
ir, *chiefly leucocratic granodiorite, quartz diorite, aplite dikes, and albite granite, in places contains inclusions of dark hybrid rocks;* a, *aplite dike, differentiated on east side of O'Brien Mountain*

UNCONFORMITY

TRIASSIC

ħh

Hosselkus limestone

ħpf ħps ħpl ħpfp ħpmf ħpp

Pit formation
ħps, *shale, mudstone, and siltstone, undifferentiated;* ħpl, *limestone (lithologically similar to the Hosselkus limestone);* ħpfp, *porphyritic quartz keratophyre and metadacite, undifferentiated;* ħpf, *nonporphyritic quartz keratophyre and metadacite, undifferentiated;* ħpp, *tuff and tuff breccia, undifferentiated;* ħpmf, *mafic flows. Open triangle and wavy line patterns in uncolored box may be used with* ħpf *where appropriate. Open triangles designate monolithologic breccia interpreted as flow breccia, wavy lines designate flow-banded rock*

ħbh1 ħbh2 ħbh3 ħbh4 ħbh5 ħbh6 ħbh7

Bully Hill rhyolite
ħbh1, *porphyritic quartz keratophyre and metadacite, undifferentiated;* ħbh2, *nonporphyritic quartz keratophyre and metadacite, undifferentiated;* ħbh3, *tuff and tuff breccia, undifferentiated;* ħbh4, *volcanic breccia;* ħbh5, *mafic flows (commonly amygdaloidal and lithologically similar to mafic flows of the Dekkas andesite);* ħbh6, *quartz keratophyre of probable intrusive origin;* ħbh 7, *mafic tuff and tuff breccia. The Bully Hill rhyolite locally intertongues with the Dekkas andesite and with the Pit formation. Open triangle and wavy line patterns in uncolored box may be used with* ħbh1 *and* ħbh2 *where appropriate. Open triangles designate monolithologic breccia interpreted as blocky lava or flow breccia, wavy lines designate flow-banded rock*

PERMIAN

Pd1 Pd2 Pd3 Pd4 Pd5 Pd6

Dekkas andesite
Pd1, *mafic flows including keratophyre and spilite, undifferentiated (commonly porphyritic and amygdaloidal);* Pd2, *volcanic breccia consisting of mafic rocks;* Pd3, *tuff and tuff breccia, undifferentiated;* Pd4, *mudstone and tuffaceous mudstone, undifferentiated;* Pd5, *quartz keratophyre;* Pd6, *spilite (probably an intrusive phase of the Dekkas andesite). Open triangle pattern in uncolored box may be used with* Pd1 *where appropriate. Open triangles designate monolithologic breccia interpreted as flow breccia*

UNCONFORMITY(?)

Pn

Nosoni formation
Predominantly tuffaceous mudstone and tuff, but includes subordinate mudstone, tuffaceous sandstone, mafic flows, and conglomerate

UNCONFORMITY(?)

Pm

McCloud limestone
Gray limestone with thin, irregular chert layers and chert nodules

UNCONFORMITY(?)

CARBONIFEROUS — MISSISSIPPIAN

Mbs Mbgs Mbl Mbp

Baird formation
Mbs, *shale, sandstone, tuff, and tuffaceous sandstone, undifferentiated;* Mbgs, *greenstone and greenstone breccia;* Mbl, *limestone and chert;* Mbp, *mafic pyroclastic rocks, with minor lenses of tuffaceous mudstone. Open triangle pattern in uncolored box may be used with* Mbgs *where appropriate. Open triangles designate monolithologic breccia*

UNCONFORMITY(?)

Mbds Mbdp Mbdc

Bragdon formation
Mbds, *shale, mudstone, and siltstone, undifferentiated;* Mbdc, *conglomerate, grit, and sandstone, undifferentiated;* Mdbp, *tuff, tuff breccia, and volcanic breccia, undifferentiated*

UNCONFORMITY(?)

DEVONIAN — Middle Devonian

Dks Dkl

Kennett formation
Dkl, *limestone;* Dks, *siliceous shale, tuffaceous shale, tuffaceous sandstone, and pyroclastic rocks, undifferentiated*

Dbr1 Dbr2 Dbr3 Dbr4 Dbr5

Balaklala rhyolite
Dbr1, *porphyritic and nonporphyritic quartz keratophyre, undifferentiated;* Dbr2, *quartz keratophyre volcanic breccia;* Dbr3, *quartz keratophyre tuff and tuff breccia, undifferentiated;* Dbr4, *mafic flows (commonly amygdaloidal, lithologically similar to mafic flows of the Copley greenstone);* Dbr5, *quartz keratophyre of probable intrusive origin. The Balaklala rhyolite intertongues with the Copley greenstone in the O'Brien Mountain area*

DEVONIAN (?)

Dcg1 Dcg2 Dcg3

Copley greenstone
Dcg1, *porphyritic, slightly amygdaloidal greenstone;* Dcg2, *volcanic breccia consisting of blocks of greenstone locally mixed with blocks of quartz keratophyre;* Dcg3, *tuff and tuff breccia, undifferentiated. Open triangle pattern in uncolored box may be used with* Dcg1 *where appropriate. Open triangles designate monolithologic breccia interpreted as blocky flows or flow*

25
Quartz veins, showing dip

Calcitized rock

Skarn
Mixture of lime silicate minerals, magnetite, and locally, minor sulfides. Occurs as alteration of the Baird formation, McCloud limestone, Nosoni formation, Dekkas andesite, mafic quartz diorite, and augite quartz diorite

35
Contact, showing dip
Dashed where approximately located, dotted where concealed

Indefinite contact
Includes gradational contacts, inferred contacts, and indefinite boundaries of surficial deposits

U 45 D
Fault, showing dip
Dashed where approximately located
U, *upthrown side;* D, *downthrown side*

90
Vertical fault

? ?
Doubtful or probable fault

Concealed fault

Anticline
Showing approximate crestline

Syncline
Showing approximate position of trough

Overturned syncline
Showing direction of dip of limbs

20
Plunge of minor anticline

12
Plunge of minor syncline

25
Strike and dip of beds

90
Strike of vertical beds

55
Strike and dip of overturned beds

Horizontal beds

30
Strike and dip of flow banding in volcanic rocks

85
Strike and dip of foliation

Strike of vertical foliation

55
Strike and dip of joints

38
Plunge of prismatic columns in volcanic and hypabyssal intrusive rocks

E-681
Fossil-bearing locality