UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

PROFESSIONAL PAPER 616
PLATE 2

EXPLANATION

QUATERNARY

Qa

Alluvium, talus, solifluction debris, and morainal deposits

TERTIARY

INTRUSIVE ROCKS

Relative age not known

Tb

Bostonite porphyry

Pale-lilac, gray, or red; groundmass has trachytic to bostonitic texture; contains rare to abundant phenocrysts of feldspar

Ts

Sanidinite porphyry

Lilac to gray; composed mainly of sanidine; contains altered feldspar phenocrysts

Tbqm

Biotite quartz monzonite porphyry

Yellowish-gray; granular to aphanitic groundmass; phenocrysts of plagioclase, sanidine, quartz, and biotite

Tib

Intrusion breccia

Altered fragments of Silver Plume Granite and leucocratic monzonite

Relative age between groups not known

Tlm, Tmv, Tmp, Tpm, Tmq, Tm, Tmf

Monzonite group

Dark- to light-gray rocks that contain little or no quartz and commonly contain abundant hornblende or pyroxene

Tlm, *leucocratic monzonite; light-gray seriate porphyritic rock composed primarily of oligoclase and microperthite*

Tmv, *hornblende-pyroxene monzonite veined by leucocratic monzonite*

Tmq, *quartz-bearing monzonite porphyry with aphanitic to fine-grained granular groundmass*

Tmp, *monzonite porphyry undivided; very fine grained highly altered dike rocks*

Tpm, *porphyritic hornblende-pyroxene monzonite*

Tm, *hornblende-pyroxene monzonite; seriate porphyritic phanerite commonly showing flow layering and alined ferromagnesian phenocrysts*

Tmf, *feldspathoidal hornblende-pyroxene monzonite; contains nepheline and sodalite*

Tg, Thg, Tbg

Granodiorite group

Porphyritic rocks variable in color, rich in quartz, and have granular groundmasses

Tg, *granodiorite porphyry undivided; intensely altered dike rocks*

Thg, *hornblende granodiorite porphyry*

Tbg, *biotite granodiorite porphyry*

pCr

Precambrian rocks undivided

Contact

Dashed where approximately located; short dashed where inferred

Fault

Dashed where approximately located; short dashed where inferred

•E-60

Chemically-analyzed-sample locality and number

△ Grid-twinned microcline ▲ Untwinned orthoclase

Locality of specimens of Precambrian rocks containing potassium feldspar

105°45′ 42′30″ 40′ 105°37′30″
39°52′30″ 47′30″ 39°45′

T-111 is Tb dike 200 feet north

EMPIRE STOCK

LINCOLN MOUNTAIN STOCK

INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D.C.—1969—G68229

SCALE 1:24 000

1 ½ 0 1 MILE

1 .5 0 1 KILOMETER

Braddock
Hawley and Moore

INDEX TO GEOLOGIC MAPPING

Geology by W. A. Braddock, 1959–62, assisted by Melvin Harper and Frederick Files. Geology by C. C. Hawley and F. B. Moore, 1952–54

INDEX MAP OF TERTIARY IGNEOUS ROCKS IN THE EMPIRE QUADRANGLE GRAND, GILPIN, AND CLEAR CREEK COUNTIES, COLORADO