PREPARED IN COOPERATION WITH
TENNESSEE VALLEY AUTHORITY

STATE OF NORTH CAROLINA
DEPARTMENT OF NATURAL AND ECONOMIC RESOURCES
OFFICE OF EARTH RESOURCES
Stephen G. Conrad, *Director*

GEOLOGIC MAP
OTEEN QUADRANGLE
NORTH CAROLINA
GM 201-SW

(Weaverville 192-NE) (Craggy Pinnacle 201-NW) (Montreat 201-NE)
(Asheville 192-SE) (Black Mountain 201-SE)
(Skyland 193-NE) (Fruitland 202-NW) (Bat Cave 202-NE)

82°30'00" 27'30" 25'00" 990 000 FEET 82°22'30"
35°37'30" 35°30'00" 32°30" 35°00" 660 000 FEET 690 000 FEET

Base topographic map by USGS-TVA 1962.
Cartography and publication by Tennessee Valley Authority.
10,000-foot grid based on North Carolina Coordinate System.

The field and office compilation sheets used in the preparation of this geologic map are on open file and available for inspection at the North Carolina Department of Natural and Economic Resources, Office of Earth Resources, Raleigh, N. C.

Geology by Dennis O. Nelson.
Mineral resources mapped by Jerry L. Bundy, Dennis O. Nelson and J. Robert Butler.
Map preparation and editing by R. W. Johnson, Jr. and J. M. Fagan.

SCALE 1:24 000

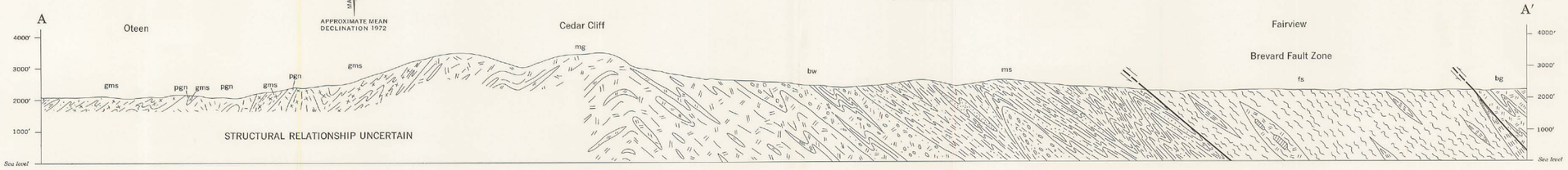
1 ½ 0 1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

CONTOUR INTERVAL 40 FEET
DASHED LINES REPRESENT HALF-INTERVAL CONTOURS
DATUM IS MEAN SEA LEVEL

MAGNETIC NORTH 2°
TRUE NORTH

APPROXIMATE MEAN DECLINATION 1972

QUADRANGLE LOCATION



SECTION ALONG A-A'
No vertical exaggeration

GEOLOGIC MAP OF THE OTEEN QUADRANGLE, NORTH CAROLINA

By

Dennis O. Nelson

1972

EXPLANATION

NORTHWEST OF THE BREVARD FAULT ZONE | BREVARD FAULT ZONE | SOUTHEAST OF THE BREVARD FAULT ZONE

QUATERNARY — AGE UNCERTAIN

Qal — Alluvium
Unconsolidated stream deposits of gravel, sand, silt, and clay.

fs — Phyllonite, Cataclastic Schist, and Mylonite
Phyllonite, light olive-gray to greenish-gray, fine- to medium-grained; cataclastic schist, bluish-gray to dark-gray, medium- to coarse-grained; mylonite, light bluish-gray to medium bluish-gray, fine- to medium-grained, occurs as thin layers in phyllonite and schist. Garnet, chlorite, and porphyroblastic muscovite are present locally. Curved mica flakes have distinctive "fish-scale" appearance.

my — Porphyroclastic Mylonite
Mylonite, yellowish-gray to medium-gray, fine-grained groundmass with round to lenticular porphyroclasts of feldspar, laminated to thin-layered, well-foliated. Groundmass composed mainly of quartz, plagioclase, microline, muscovite, chlorite, and biotite. Grades into cataclastic schist and phyllonite.

cg — Cataclastic Gneiss
Cataclastic biotite gneiss and muscovite gneiss, light-gray to medium dark-gray, medium- to coarse-grained, thin-layered to massive; interlayered with subordinate biotite-muscovite schist that locally contains garnet. Impure marble present locally. Intense cataclasis evident in outcrop.

am — Amphibolite and Hornblende Gneiss
Amphibolite and hornblende gneiss, dark-gray, medium-grained, composed mainly of hornblende, plagioclase, quartz, and biotite.

MIDDLE PALEOZOIC (?)

φ pg — Pegmatite and Aplite Bodies
(Contacts shown for larger bodies, symbol φ indicates pegmatite bodies too small to show at map scale.)
Pegmatite, very coarse-to medium-grained, composed mainly of plagioclase, microcline, quartz, muscovite, and biotite, locally contains garnet and tourmaline; aplite, medium-grained, composed of plagioclase, quartz, and muscovite. Bodies are generally concordant and not conspicuously zoned; most are less than 10 ft. thick, but some are more than 300 ft. thick.

UPPER PRECAMBRIAN (?) OR LOWER PALEOZOIC (?)

gb — Metagabbro
Metagabbro, dark-gray, medium-grained, composed primarily of pyroxene, hornblende, and plagioclase. Bodies are concordant or semi-concordant.

um — Altered Ultramafic Rock
Altered ultramafic rock, greenish-gray to dark greenish-gray, medium- to coarse-grained, composed mainly of iron-rich olivine, pyroxene, hornblende, garnet, chlorite, actinolite, and serpentine. Rock is extensively altered and strongly sheared, especially near contacts. Bodies are generally semi-concordant.

am — Amphibolite and Hornblende Gneiss
Amphibolite and hornblende gneiss, dark-gray, medium-grained, composed mainly of hornblende, plagioclase, quartz, and biotite. Generally occur in discontinuous, concordant bodies.

PRECAMBRIAN — STRATIGRAPHIC RELATIONSHIP UNCERTAIN

pgn — Biotite-Plagioclase-Quartz Gneiss
Biotite-plagioclase-quartz gneiss, light- to dark-gray, medium-grained, thick-layered to massive; interlayered with minor amounts of muscovite-biotite schist. Garnet, sillimanite, chlorite, and calcite occur locally. Unit contains lenses and pods of pegmatite and aplite.

gms — Garnetiferous Mica Schist
Garnetiferous mica schist, lustrous-white to dark-gray, medium- to coarse-grained; interlayered with minor amounts of medium-grained feldspathic metasandstone and rarely with quartz-pebble metaconglomerate. Schist is composed mainly of biotite, muscovite, quartz, and garnet, and locally contains one or more of the following minerals: feldspar, kyanite, sillimanite, staurolite, chlorite, and conspicuous muscovite porphyroblasts.

mg — Layered Mica Gneiss and Schist
Muscovite-biotite-feldspar-quartz gneiss, light- to dark-gray, medium- to coarse-grained, thin layers of contrasting appearance; interlayered with subordinate amounts of garnet-biotite-muscovite schist, biotite schist, and quartz-feldspar gneiss. Rock types occur in continuous layers or in pods and lenses.

bw — (Small circles indicate places where metaconglomerate was observed.)
Metasandstone and Schist
Metasandstone, medium bluish-gray to yellowish-gray, medium- to fine-grained, thick- to thin-layered; schist, generally lustrous-light olive-gray to dark greenish-gray, medium- to fine-grained. Metasandstone grades into metaconglomerate locally.

ms — Mica Schist
Mica schist, dark-gray to lustrous-white (depending on relative percentages of biotite and muscovite), medium- to coarse-grained, generally thin-layered but locally thick-layered, locally contains porphyroblasts of garnet and muscovite, interlayered with micaceous-feldspathic metasandstone and rare metaconglomerate.

cw — (Small circles indicate places where metaconglomerate was observed.)
Metasandstone, Metaconglomerate, and Biotite-Muscovite Schist
Metasandstone and metasiltstone, medium light-gray to yellowish-gray, massive- to thin-layered; metaconglomerate, light bluish-gray, massive- to thick-layered, graded in places, with deformed quartz pebbles as much as two inches in length; biotite-muscovite schist, lustrous-gray to dark-gray, medium- to fine-grained.

bg — Biotite-Muscovite Gneiss
Biotite-muscovite gneiss, dark-gray to bluish-gray, medium- to coarse-grained, thin- to medium-layered, nonfoliated to distinctly foliated; locally with thin interlayers of muscovite-biotite schist. Locally contains porphyroclasts of feldspar as much as one-half inch in length. Intensively sheared near the contact with the Brevard Fault Zone.

Geologic contact, dashed where approximately located, short dashes where inferred.
Fault, dashed where approximately located; arrows in cross section indicate inferred relative movement.
Antiform, drawn on foliation or bedding; approximately located.

Mine or Quarry: inactive ⚒ | Sand and Gravel Pit: active ⛏ | Prospect: X

MI St Mica Schist
Ma Marble
SG Sand and gravel
MI Muscovite mica
CS Crushed stone
⊙ Sample locality, Mica Schist Evaluation Project
2 Map numbers refer to description in Mineral Resources Summary.

PLANAR FEATURES

40 Strike and dip of bedding.
65 Strike and dip of compositional layering other than bedding.
43 Strike and dip of schistosity.
45 Strike and dip of foliation in non-schistose rocks.
55 Strike and dip of axial plane of small fold.

LINEAR FEATURE

23 Bearing and plunge of axis of small fold.

MINES, PROSPECTS, AND SAMPLE LOCALITIES

1 — Cumberland Sand and Gravel Company pit.
2 — Unnamed mica mine.
3 — Swannanoa mica mine.
4 — Patton Cove mica mine.
5 — Unnamed mica prospect.
6 — F. D. Kuykendall mica prospect.
7 — Shoat mica prospect.
8 — W. M. Mills mica prospect.
9 — Moser Cove mica prospect.
10 — Bassett mica prospect.
11 — A. M. White mica prospect.
12 — C. M. McCracken mica prospect.
13 — Alejohntner mica prospect.
14 — Unnamed crushed stone quarry.
15 — Unnamed marble prospect.
16,17 — Sample locality, Mica Schist Evaluation Project