Prepared in cooperation with
THE STATE OF CONNECTICUT
GEOLOGICAL AND NATURAL HISTORY SURVEY

Base from U.S. Geological Survey, 1968, photorevised 1972
10,000 foot grid based on Connecticut coordinate system
1000-meter Universal Transverse Mercator grid ticks, zone 18, shown in blue

APPROXIMATE MEAN DECLINATION, 1968

SCALE 1:24 000

1 ½ 0 1 MILE

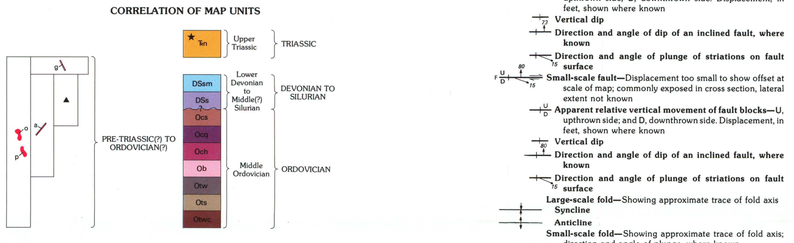
1 .5 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL

Geology by Howard E. Simpson, 1956–62; assisted by A. L. Nalwalk, 1956, J. F. Langmuir, 1957, G. W. Johnson, 1958, and R. L. Melvin, 1961

QUADRANGLE LOCATION

## CORRELATION OF MAP UNITS




## DESCRIPTION OF MAP UNITS

[Nomenclature updated in 1990]

[Minerals are listed in order of decreasing abundance. Grain sizes are as follows: fine, < 1 mm; medium, 1–5 mm; coarse > 5 mm]

**Unnamed basalt**—Fine grained, very dark gray, hard, strong, tough. No contacts exposed. Possibly part of a dike. Exposed only on southwest flank of Campground Hill, in east-central part of map area

Ten **New Haven Arkose of Newark Supergroup (Upper Triassic)**—Generally coarse- to fine-grained, pale-reddish-brown to grayish-red, micaceous, feldspathic to arkosic sandstone and conglomerate, probably with a little siltstone and silty shale. Sandstone massively to well bedded. Best exposed in Pequabuck River channel. Conglomerate poorly bedded, characterized by rounded to subrounded stones, some as large as 15 cm in maximum dimension; pebbles of medium-dark-gray phyllite not reported to occur in metamorphic terrain to west are common; very light colored adjacent to boundary fault in north half of quadrangle, probably bleached, and contains traces of chalcopyrite, pyrite, and malachite. Red conglomerate exposed on east flank of Redstone Hill in southeast part of map area; light-colored conglomerate best exposed in and near east part of Page Park, and commonly found as small loose stones in mine dumps at south end of Mine Mountain, or as large, scattered, glacial erratics just south and west of the Mine Mountain-Page Park area. Basal contact of formation not exposed. Thickness not known

p **Unnamed pegmatite (pre-Triassic? to Ordovician?)**—Coarse-grained, white to moderate-orange-pink, generally nonfoliated, nonconformable, and nonzoned granitic pegmatite, composed chiefly of potassium or plagioclase feldspar, quartz, and subordinate muscovite, biotite, and tourmaline. Potassium feldspar almost wholly in tabular bodies, plagioclase feldspars wholly in podlike lenses. Small, slim tourmaline crystals locally concentrated in outermost 30 cm of some plagioclase feldspar dikes, with number of crystals increasing outward. Contacts of tabular bodies abrupt, rarely exposed; contacts of lenses abrupt, commonly exposed. Thickness of tabular bodies less than 4 m; of lenses, less than 16 m. Tabular potassium feldspar bodies located mostly on crest at south end of Mine Mountain and along roadcut south of and parallel to Pequabuck River; lenticular plagioclase bodies widely scattered, mostly near east margin of metamorphic terrane. Principal exposures of pegmatite with plagioclase feldspar indicated by p, and with potassium feldspar by o

g **Unnamed granite (pre-Triassic? to Ordovician?)**—Fine-grained, very light gray, nonfoliated, nonconformable granite composed of feldspar, quartz, biotite, and muscovite. Forms tabular dikes as much as 90 cm thick. Contacts abrupt and exposed. One locality situated just northeast of Fall Mountain Lake, another near the north end of Mine Mountain

a **Unnamed amphibolite (pre-Triassic? to Ordovician?)**—Medium grained, grayish black, nonconformable, composed chiefly of amphibole and plagioclase. One contact exposed; believed to form dike with inferred thickness less than 3 m. Sole locality situated just east of Bristol Reservoir No. 1, in west-central part of map area

▲ **Unnamed serpentinite (pre-Triassic? to Ordovician?)**—Very fine grained, greenish black to moderate greenish yellow, thoroughly fractured, composed chiefly of serpentine; asbestos fibers as much as 3 mm long fill some fractures, random fractures slickensided. Constitutes two lenses as much as 30 m thick and 90 m long, oriented in direction of strike; contacts unexposed. One locality situated on south flank of Johnnycake Mountain, the other on east flank of Federal Hill

DSsm **Southington Mountain Member of The Straits Schist (Lower Devonian to Middle? Silurian)**—Interlayered, equigranular, medium-grained, medium-light-gray to medium-gray gneiss, and satiny, medium- to fine-grained, silver-gray mica schist. Gneiss composed chiefly of quartz, plagioclase, muscovite, biotite, and garnet, with minor staurolite, kyanite, chlorite, magnetite-ilmenite, and tourmaline. Schist composed chiefly of quartz, muscovite, biotite, plagioclase, garnet, and graphite, with minor staurolite, kyanite, chlorite, tourmaline, magnetite-ilmenite, and pyrite. Garnets generally 1–3 mm in diameter; staurolite porphyroblasts range from 0.5 to 4 cm long in southwest corner of quadrangle. Characterized by beds 4–8 cm thick grading from granofelsic to schistose; schistose beds show moderate-reddish-brown weathering. Intruded by many small unmapped granitic pegmatites. Includes scattered, unmapped, conformable lenses of hornblende-plagioclase-garnet amphibolite a few to several meters thick and several meters to tens of meters long. Generally asymmetrically folded, in part isoclinally. Distinguished from underlying The Straits Schist by obvious graded bedding. Basal contact, which is gradational through a distance of as much as 0.8 km, is arbitrarily placed midway between exposures with and without obvious graded bedding

DSs **The Straits Schist (Lower Devonian to Middle? Silurian)**—Coarse to medium grained, silver gray, composed chiefly of quartz, muscovite, biotite, plagioclase, garnet, staurolite, kyanite, graphite, magnetite-ilmenite, tourmaline, and chlorite. Garnets range from 1 to 10 mm in diameter; staurolite porphyroblasts range from 2 to 5 cm long on the north flank of South Mountain. Characterized by crenulated folding, abundant large muscovite flakes, and lack of graded bedding. Intruded by numerous small unmapped pegmatite lenses. Includes scattered small, unmapped, conformable lenses of hornblende-plagioclase-garnet amphibolite a few to several meters thick and from several meters to several tens of meters long; also includes very small boudins and mullions of quartz. Locally intensely crenulated, generally asymmetrically folded. Graded bedding scattered, somewhat indistinct. Basal 5 m of unit consists of coarse-grained, crudely bedded, plagioclase-quartz-muscovite-biotite-garnet gneiss. Contains scattered plagioclase porphyroblasts as large as 2 cm in diameter. Distinguished by its coarse grain size, greater plagioclase content, smaller muscovite flakes, more biotite, lack of crenulation, crude bedding, and rare small garnets from rest of unit

**Collinsville Formation (Middle Ordovician)**

Ocs **Sweetheart Mountain Member**—Medium-grained, salt-and-pepper schist composed chiefly of biotite, muscovite, quartz, plagioclase, garnet, magnetite-ilmenite, and kyanite, with minor chlorite and tourmaline. Distinguished by approximately equal amounts of biotite and muscovite, medium grain size of micas, and absence of graphite and crenulations from The Straits Schist. Garnets are 1–3 mm in diameter; magnetite cubes as much as 5 mm on a side are common on the southeast side of Mine Mountain. Intruded by several small unmapped pegmatite lenses. Includes small, scattered, unmapped, conformable lenses of hornblende-plagioclase-garnet amphibolite 30 cm to a few meters thick and a few to several meters long. Schist locally marked by small isoclinal folds. Basal contact, generally poorly exposed, is distinct and well exposed in vicinity of the Pequabuck River east of Bristol; there it is drawn at the top of the underlying metaquartzite, and where the metaquartzite is absent or not exposed the contact is drawn where the rock changes from dominantly schist to amphibolite

Ocq **Unnamed metaquartzite member**—Medium to fine grained, very pale orange, composed chiefly of quartz, some feldspar, and minor pyrite, magnetite-ilmenite, garnet, biotite, and muscovite; micas, garnet, and feldspar increase northward. Quartz granulites interbedded with schists and amphibolite may represent this unit in a roadcut exposure about 675 m east of Terryville Station. Unit characterized by cut-and-fill crossbedding. Lower contact distinct and well exposed south of Pequabuck River east of Bristol. Unit observed for about 4 km along east part of Bristol

Och **Unnamed hornblende gneiss member**—Fine to medium grained, grayish black to greenish black, composed of hornblende, plagioclase, quartz, biotite, garnet, epidote, and calcite. Pale-reddish-brown to light-red garnets 1–10 mm in diameter are scattered throughout the rock and locally form layers as much as 2.5 cm thick of fine-grained, massive, pink to light-red coticule. On the east side of Bristol just south of the Pequabuck River and just north of U.S. Highways 6 and 202 are distinct lenses of epidote-rich rock as large as 1 m thick and 12 m long. Biotite forms rare scattered layers as much as 15 cm thick. Unit characterized by intense asymmetric folding, solution pitting of smoothly glaciated surfaces, widely spaced joints, and light-colored bands from 2 to 6 cm thick composed of quartz and plagioclase, which emphasize the pattern of folding. Basal contact drawn through a transitional zone 15–30 m thick that consists of interbedded hornblende gneiss and plagioclase gneiss

Ob **Bristol Gneiss (Middle Ordovician?)**—Medium grained, very light to medium light or greenish gray, composed chiefly of plagioclase, quartz, biotite, and garnet. Biotite concentrated in folia 1–2 mm thick, which alternate with folia 2–5 mm thick composed of quartz and plagioclase, giving a characteristic pinstriped appearance. Biotite also forms scattered layers 2–12 cm thick, some of which are chloritized. Garnets 1–2 mm in diameter are scattered throughout the unit. Scattered unmapped lenses of folded amphibolite gneiss as much as several meters thick and several tens of meters long are exposed locally. Basal contact drawn through a transitional zone 15–30 m thick that consists of interbedded Bristol and muscovite-bearing gneiss

**Taine Mountain Formation (Middle Ordovician)**

Otw **Whigville Member**—Medium grained, medium light to medium dark gray, composed chiefly of plagioclase, quartz, muscovite, biotite, and garnet. Biotite folia about 1 mm thick alternate with folia of quartz and plagioclase 2–3 mm thick, giving a pinstriped appearance. In uppermost part, garnets less than 2 mm in diameter cause rounded "hobnails" of muscovite 3–4 mm in diameter. The rock tends to break into angular slabs about 0.5–1 m thick and a few to several meters across. Weathers yellowish brown. Distinguished by its yellowish-brown weathering, angularity of slabs, and lesser mica content from the underlying Scranton Mountain Member. The basal contact is drawn at the top of the highest bed that weathers reddish brown

Ots **Scranton Mountain Member**—Medium-grained, medium- to dark-gray, schistose gneiss composed chiefly of quartz, plagioclase, muscovite, biotite, garnet, and kyanite. Thin but crude interlayering of light and dark minerals gives a pinstriped appearance that is modified by folding. Garnets 2–4 mm in diameter cause prominent rounded "hobnails" of mica about 5 mm high. Breaks into lenticular slabs 0.5 m thick and a few meters across. Weathers moderate reddish brown. Distinguished by its reddish-brown color on weathering, greater mica content, and lenticularity of slabs from the underlying unit. Basal contact not exposed; Stanley (1964, p. 20) reported that it "is apparently not gradational, and can be located within a zone 10 to 20 feet thick"

Otwc **Wildcat Member**—Fine to medium grained, medium to dark gray, composed chiefly of quartz, plagioclase, biotite, muscovite, and garnet. Biotite folia about 1 mm thick alternate with folia composed of quartz and plagioclase 2–3 mm thick, giving a pinstriped appearance. Weathers yellowish brown. Base not exposed

**Contact**—Showing strike; direction and angle of dip shown where known. Long dashed where approximately located, short dashed where inferred

**Large-scale fault**—Generally covered by glacial deposits. Long dashed where approximately located, short dashed where inferred

**Apparent relative vertical movement of fault block**—U, upthrown side; D, downthrown side. Displacement, in feet, shown where known

**Vertical dip**

**Direction and angle of dip of an inclined fault, where known**

**Direction and angle of plunge of striations on fault surface**

**Small-scale fault**—Displacement too small to show offset at scale of map; commonly exposed in cross section, lateral extent not known

**Apparent relative vertical movement of fault blocks**—U, upthrown side; and D, downthrown side. Displacement, in feet, shown where known

**Vertical dip**

**Direction and angle of dip of an inclined fault, where known**

**Direction and angle of plunge of striations on fault surface**

**Large-scale fold**—Showing approximate trace of fold axis

**Syncline**

**Anticline**

**Small-scale fold**—Showing approximate trace of fold axis; direction and angle of plunge, where known

**Syncline**

**Anticline**

**Joint**—Showing strike, with direction and angle of dip where known

**Inclined**

**Vertical**

**Lineaments**—Inferred from aerial photographs and in part from the topographic base map. Position of some lineaments adjusted to base

**Attitude of inclined bedding**—Showing strike of inclined beds in sedimentary rocks, with direction and angle of dip where known

**Attitude of planar schistosity**—Showing strike of schistosity, with direction and angle of dip where known; dip queried where angle uncertain. Arrow and number show direction and amount of plunge of lineation, where known. Ball indicates top of bed known. Kind of lineation shown by letter: b, boudin or mullion; c, crenulation; f, fold axis; m, mineral

**Inclined**

**Vertical**

**Attitude of folded schistosity**—Showing strike of schistosity, with direction and angle of dip where known; dip queried where angle uncertain. Arrow and number show direction and amount of plunge of lineation, where known. Ball indicates top of bed known. Kind of lineation shown by letter: b, boudin or mullion; c, crenulation; f, fold axis; m, mineral

**Inclined**

**Vertical**

S **Bedrock exposure**—Sedimentary bedrock indicated by letter S

**Inactive quarry**—Small, generally several feet deep and several yards wide and long. Generally opened as a local source of building stone

**Abandoned mine shaft**

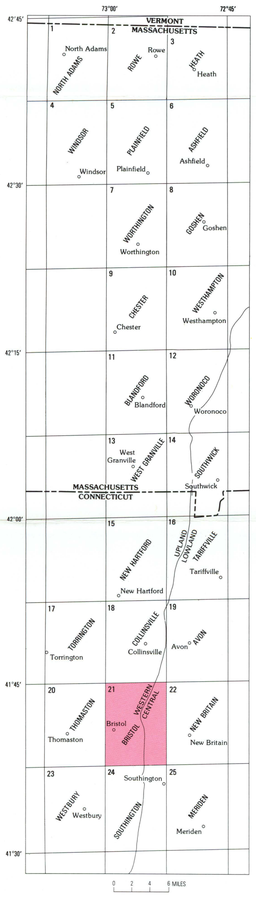
25.4 **Gravimeter-traverse station**—Shows reading in milligals corrected for assumed average rock density of 1.70 for metamorphic rocks and 2.55 for sedimentary rocks on each reconnaissance traverse

**Type locality of a formation**

B **Bristol Gneiss**—Located along the Penn Central Railroad (formerly New York, New Haven, and Hartford Railroad) cut near the center of the quadrangle

W **Whigville Member of the Taine Mountain Formation**—Located about 2,000 ft (615 m) south-southwest of Whigville, near the north-central part of the quadrangle boundary

## INDEX OF DETAILED BEDROCK GEOLOGIC MAPPING IN AND NEAR THE EAST PART OF THE WESTERN UPLAND, MASSACHUSETTS AND CONNECTICUT, INCLUDING THE BRISTOL QUADRANGLE

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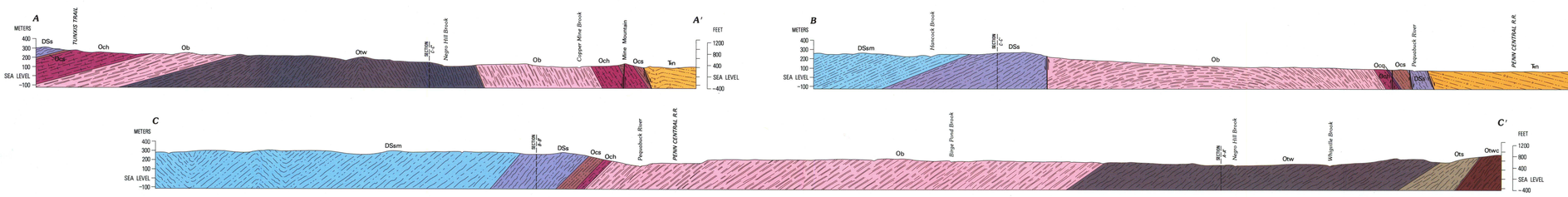


# BEDROCK GEOLOGIC MAP OF THE BRISTOL QUADRANGLE, HARTFORD, LITCHFIELD, AND NEW HAVEN COUNTIES, CONNECTICUT