Thompson Rodgers Bedrock Compilation Sheet (paper)

Map

NOTICE !

Bedrock quadrangle 1:24,000 scale compilation sheets for the Bedrock Geological Map of Connecticut, John Rodgers, 1985, Connecticut Geological and Natural History Survey, Department of Environmental Protection, Hartford, Connecticut, in Cooperation with the U.S. Geological Survey, 1:125,000 scale, 2 sheets. [minimum 116 paper quad compilations with mylar overlays constituting the master file set for geologic lines and units compiled to the State map, some quads have multiple sheets depicting iterations of mapping]. Compilations drafted by Nancy Davis, Craig Dietsch, and Nat Gibbons under the direction of John Rodgers.

Geologic unit designation table translates earlier map unit nomenclature to the units ultimately used in the State publication.

This map set contains unpublished maps, cross- sections, and related information archived by the State Geological and Natural History Survey of Connecticut as part of the Survey Library Collection.

These materials have not been reviewed for accuracy, consistency, or completeness. For many geographic areas, more current information exists, either in published or unpublished form.

These materials were developed under research and mapping agreements between the State Geological Survey and individual scientists, academic institutions, or graduate students. The veracity of the information contained within these documents is the responsibility of the authorship. The State Geological and Natural History Survey of Connecticut, does not promote or endorse this content, nor does the State Survey attest as to its level of accuracy.

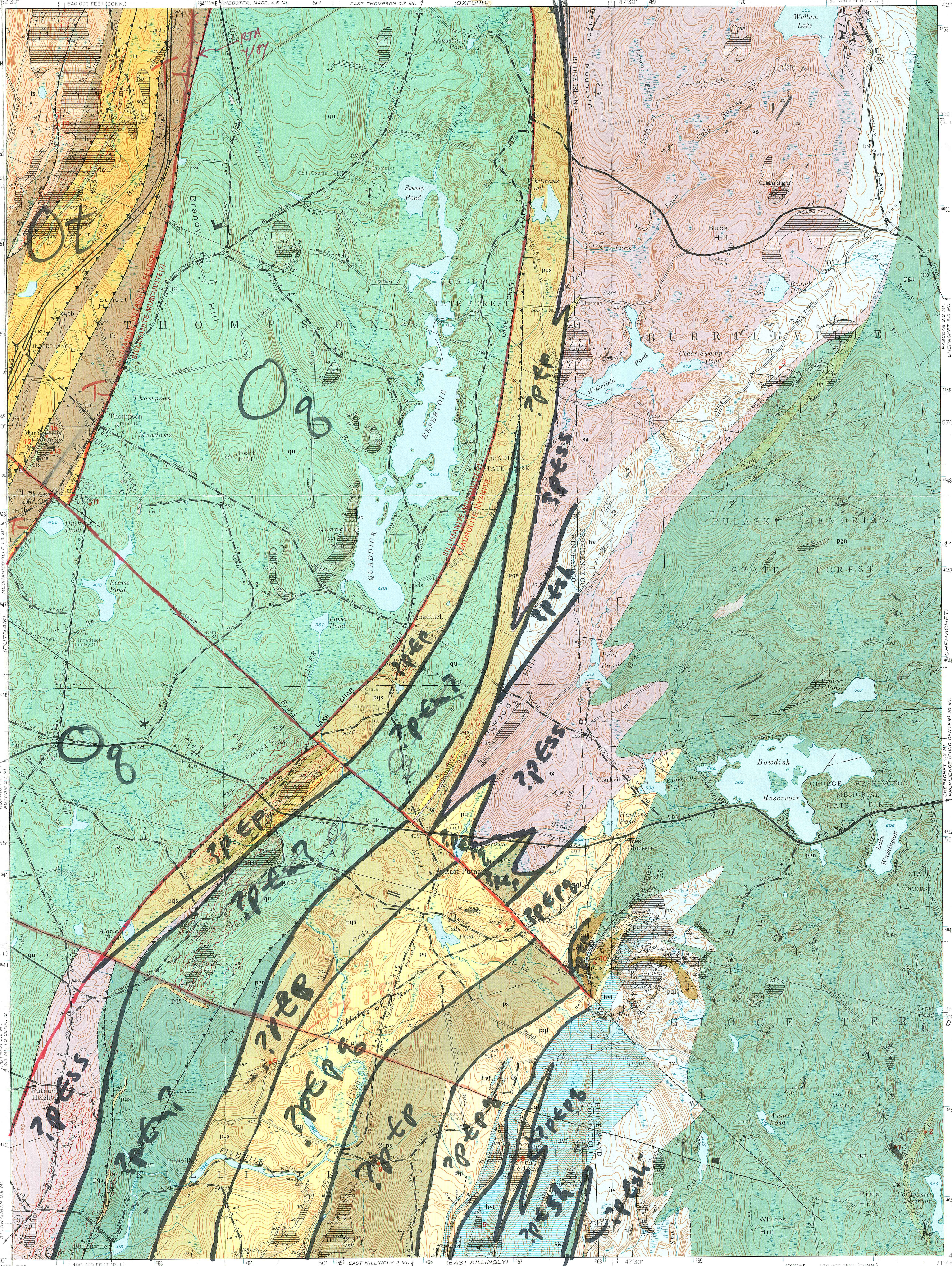
These materials have been preserved under a cooperative agreement between the State Geological Survey and the US Geological Survey as part of the National Geological and Geophysical Data Preservation Program. www.datapreservation.usgs.gov

These materials are offered in the spirit of open government. Reproduction of these manuscripts was conducted to the highest practical degree, within the parameters of the funding mechanism. Original documents are available for inspection by contacting the Connecticut State Geologist.

'Jh Interpretative geology 1720 July 1578

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

Prepared in cooperation with the
STATE OF CONNECTICUT GEOLOGICAL AND NATURAL HISTORY SURVEY
and the
STATE OF RHODE ISLAND DEVELOPMENT COUNCIL



Base from U.S. Geological Survey, 1955
Photorevision as of 1970
10,000-foot grids based on Connecticut and Rhode Island coordinate systems
1000-meter Universal Transverse Mercator grid ticks, zone 19, shown in blue

APPROXIMATE MEAN DECLINATION, 1974

SCALE 1:24 000

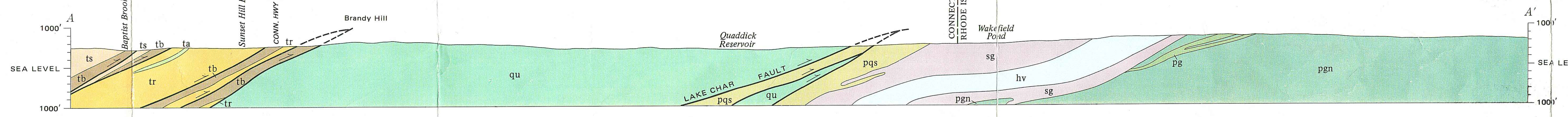
1 MILE

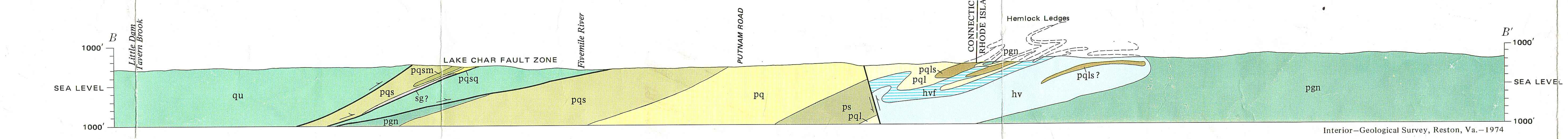
1 KILOMETER

CONTOUR INTERVAL
DATUM IS MEAN SEA LEVEL

QUADRANGLE LOCATION

Geology by P. M. Hanshaw, 1960, and H. R. Dixon, 1962 and 1968; assisted by Shirley McDowell, 1960 and 1962, Mary Tisue, 1962, and Karen Felmlee, 1968





Interior—Geological Survey, Reston, Va.—1974

BEDROCK GEOLOGIC MAP OF THE THOMPSON QUADRANGLE, WINDHAM COUNTY, CONNECTICUT, AND PROVIDENCE COUNTY, RHODE ISLAND

By
H. Roberta Dixon
1974

CORRELATION OF MAP UNITS

sg
hv, hvf
pgn, pg
} MISSISSIPPIAN(?) OR OLDER

ts
tb, ta
tr
qu
} MIDDLE(?) ORDOVICIAN OR OLDER

pqs, pqsq, pqsm
pq
ps
pql, pqls
} CAMBRIAN(?)

DESCRIPTION OF MAP UNITS

Mineral modifiers in rock names are given in order of increasing abundance, with the least abundant mineral listed first. All colors cited are the closest match to colors of the Rock Color Chart, by E. N. Goddard and others, G.S.A., 1948.

sg — SCITUATE GRANITE GNEISS (MISSISSIPPIAN(?) OR OLDER) – Fine- to medium-grained, grayish-orange to light-gray granitic gneiss consisting of approximately equal amounts of quartz, microcline, and albite to sodic andesine, 2–6 percent biotite, and minor muscovite. Muscovite is most abundant along the western edge of the body; west of Wakefield Pond are lenses of muscovite gneiss containing more than 10 percent muscovite and no biotite. Where most abundant biotite is aggregated in splotches, which are weakly to strongly strung out in the regional north-plunging lineation direction. The gneiss may contain coarse feldspar grains as much as 2 cm long; these are most common in the vicinity of Badger Mountain. The Scituate Granite Gneiss is gradational into Hope Valley Alaskite Gneiss, and in places, as on Elmwood Hill, differs from the alaskite only in that it contains 2 or 3 percent biotite (table 1, sample no. 4)

The Scituate Granite Gneiss in the southwest corner of the map is blastomylonite gneiss and contains feldspar porphyroclasts as much as 1 cm long in a fine-grained, granulated matrix of quartz, feldspar, and chloritized biotite. The gneiss has been altered to varying degrees so that most biotite is now chlorite and plagioclase is partially altered to sericite, epidote, and calcite. In the northern body of Scituate, the rocks along the western edge show a weak to moderate cataclastic fabric in which streaks of granulated minerals separate zones of ungranulated grains. The Scituate(?) between imbricate slices of the Lake Char fault is blastomylonite. The rock is dusky greenish gray, with diffuse streaks and splotches of fractured and altered pinkish feldspar. The feldspars are in a very fine grained matrix of quartz, chlorite, epidote, and unidentified alteration minerals

HOPE VALLEY ALASKITE GNEISS (MISSISSIPPIAN(?) OR OLDER)

hv — Medium-grained, pinkish-gray, grayish-orange, and light-gray granitic gneiss. Contains approximately equal amounts of quartz, albite to sodic oligoclase, and microcline; in most rocks microcline is slightly less abundant than the others, (table 1, sample no. 3) but locally is more abundant. Mafic minerals, magnetite and biotite, commonly are less than 1 percent of the rock. As much as 10 percent muscovite may be present but commonly it is much less abundant or not present; in many rocks it is an alteration mineral. Accessory minerals include apatite, zircon, and locally garnet. The rock has a weak foliation formed by alternating lenses of quartz and feldspar. A lineation is expressed by rodded quartz aggregates and by alinement of the sparse biotite flakes, where present

hvf — Fine-grained, light-gray, grayish-orange, and grayish-orange-pink granitic gneiss. Composed of about equal amounts of quartz and albite and slightly less abundant microcline (table 1, sample no. 5). Biotite is most commonly less than 1 percent but may make up a few percent of the rock. Muscovite is present in some rocks and is locally as much as 10 percent of the rock. Accessory minerals include apatite, zircon, magnetite, and locally garnet. The rock in general is similar to unit hv except for the finer grain size, and it is apparently gradational into hv. The rock is commonly weakly foliated, although in places it is finely banded with alternating thin laminae of quartz and feldspar. More commonly it has a prominent lineation formed by thin quartz and feldspar rods and by alinement of sparse micas. It is commonly in the form of sills interlayered with quartzite or quartz schist of the Plainfield Formation, and in the vicinity of Kentuck Ledges and Hemlock Ledges many outcrops contain rocks of both units. Contacts between them are commonly concordant but in places are sharply discordant

pgn — PONAGANSET GNEISS (MISSISSIPPIAN(?) OR OLDER) – Medium grained, light- to medium-gray granitic gneiss typically containing biotite and megacrysts of microcline as much as 2 cm long. Proportions of the constituent mineral are variable, but the most common rock contains about equal amounts of quartz and oligoclase (30–40 percent), less abundant potassium feldspar (20–30 percent), and 3–10 percent biotite (table 1, sample no. 1). Garnet, and locally hornblende, may be present in minor amounts; other accessory minerals include apatite, zircon, sphene, allanite, and opaque minerals. Muscovite or epidote in most rocks are alteration products. The majority of the potassium feldspar is in the microcline megacrysts; thus rocks which contain small or sparse megacrysts commonly contain lesser amounts of potassium feldspar. The rocks vary from well foliated to poorly foliated. Foliation is defined by a parallel arrangement of biotite flakes, so that rocks with most abundant biotite are most strongly foliated. In most rocks biotite flakes are also arranged in elongate streaks or patches to give a pronounced lineation. The Ponaganset Gneiss exposed in the southwest corner of the area shows a strong cataclastic foliation. Lenses of quartzite and quartz schist of the Plainfield Formation are apparently more abundant in the outcrop area of Ponaganset Gneiss in the southwest corner of the map than is indicated, as boulders of these rocks occur with boulders of Ponaganset throughout that area

pg — Lens of fine- to medium-grained, buff to gray gneiss without microcline megacrysts. Lenses occur throughout the Ponaganset Gneiss. Only those which could be traced beyond a single outcrop are shown on the map. The lens in the southeast corner is deficient in potassium feldspar (less than 5 percent) and high in biotite (15–20 percent) (table 1, sample no. 2). The lenses to the north are similar in composition to the common Ponaganset Gneiss, and differ only in that the microcline is in medium-sized grains rather than in megacrysts. Some outcrops contain small lenses of fine-grained commonly buff-colored gneiss that are too small to map separately

TATNIC HILL FORMATION (MIDDLE(?) ORDOVICIAN OR OLDER) – Metasedimentary gneisses mixed with some possible metavolcanic gneisses in the lower part. The rocks exposed in the Thompson quadrangle are part of the lower member of the formation and consist primarily of biotite-quartz-feldspar gneiss, some of which contains garnet and sillimanite. Less abundant rock types include calc-silicate gneiss and amphibolite. Lenses of the latter were mapped in the few places where exposures could be traced beyond an individual outcrop. Within the quadrangle the gneisses of the formation are in the sillimanite-potassium feldspar grade of regional metamorphism. Many of the rocks show a cataclastic fabric superimposed on the regional metamorphic fabric; locally the rocks are mylonite or blastomylonite. Lenses of quartz-feldspar pegmatite gneiss a few inches to a few feet thick are common

ts — Sillimanite gneiss – Fine- to medium-grained, medium- to dark-greenish gray silimanite-biotite-oligoclase-quartz gneiss (table 1, sample no. 14) interlayered with nonsillimanitic gneiss. Potassium feldspar may be present in minor to major amounts; where abundant it is microcline. Muscovite is present in some rocks as an alteration of feldspar and sillimanite; it is commonly gradational into fine-grained sericite. Sillimanite is commonly altered to sericite and the rock is characterized by dark-green resistant sericite pods that stand out on the weathered surface. Locally the weathered surface may be moderately rust stained. Accessory minerals include apatite, zircon, and opaque minerals

tb — Garnet-biotite gneiss – Fine- to medium-grained, dark-gray garnet-biotite-quartz-oligoclase gneiss (table 1, sample no. 13) interlayered with nongarnetiferous gneiss, sillimanite bearing gneiss and minor calc-silicate gneiss. Moderate to dusky red garnet commonly averages 5–10 percent of the rock, but locally constitutes more than 50 percent and individual grains may be an inch or more in diameter. Potassium feldspar is present in many of the gneisses, and where abundant is either microcline or megacrysts of a clear pink orthoclase(?). Sillimanite-bearing rocks are not as common as in unit ts, although where present sillimanite in coarse prismatic grains is fairly abundant. Accessory minerals are as in unit ts. The unit is gradational into ts above with an increase in sericitic pods of altered sillimanite, and into tr below with an increase in interlayered rusty weathering gneiss

tr — Rusty-weathering gneiss – Fine- to medium-grained, red to yellow weathering, (medium- to dark-gray on fresh surface although weathering is deep and fresh rock is rarely seen) biotite-garnet-microcline-oligoclase-quartz gneiss contains fibrolitic sillimanite (table 1, sample no. 12) although in places neither sillimanite nor garnet is present. Garnet in the rusty gneiss is a distinctive pale red. Graphite and sulfides are abundant accessory minerals; other accessories include rutile, zircon, and apatite. Most cataclastic rocks of this unit are strongly altered

ta — Amphibolite – Medium-grained, dark-gray layered to massive biotite-andesine-hornblende amphibolite, containing minor epidote, sphene, quartz, and opaque minerals (table 1, sample no. 15). Forms lenses commonly as much as 20 feet thick that can occur in any of the other units, although they are most abundant near the lower part of the formation

qu — QUINEBAUG FORMATION (MIDDLE(?) ORDOVICIAN OR OLDER) – Hetergeneous group of gneisses of probable volcanic origin. The most common rocks are medium- to dark-greenish-gray, fine- to medium-grained biotite-quartz-andesine gneiss, and biotite-hornblende-quartz-andesine gneiss (table 1, sample no. 11). Interlayered with these are less abundant amphibolite, calc-silicate gneiss, and light-gray quartz-feldspar gneiss. Epidote is present in minor amounts in most rocks and abundant in some rocks. Garnet also is present in some rocks. Accessory minerals include sphene, rutile, zircon, apatite, allanite, and opaque minerals. These rocks are probably in the sillimanite-muscovite grade of regional metamorphism, although there is no direct evidence within the area for metamorphic grade. Mineral assemblages in the rocks are, however, similar to those in the rocks south of this area that are associated with sillimanite-muscovite bearing rocks. Much of the Quinebaug Formation in this area is mylonite gneiss, mylonite, or blastomylonite; the latter two occur adjacent to the major thrust faults at the base and the top of the unit as well as locally between them. In the blastomylonites the mafic minerals are converted to chlorite and the feldspar is altered in varying degrees to sericite-muscovite, epidote, calcite, or scapolite. The mylonite gneisses contain 10–90 percent clasts of medium-grained feldspars, hornblende, and less commonly quartz in a very fine grained matrix of granulated quartz, feldspar, and biotite. The three member subdivision of the formation recognized south of this area cannot be made in the Thompson quadrangle; no evidence was found for the middle member of calcic metasedimentary rocks

PLAINFIELD FORMATION (CAMBRIAN?)

pqs — Fine- to medium-grained, light-gray to medium-light-gray, commonly stained grayish-orange, biotite-muscovite-quartz schist (table 1, sample no. 6) interlayered with lesser amounts of light-gray quartzite. The schist may contain minor plagioclase and locally sparse garnets as much as 1 cm in diameter. Accessory minerals include opaque minerals, apatite, tourmaline, and zircon. The schist consists of alternating the laminae, commonly a few millimeters in thickness, of micaceous and quartzitic rock. The laminae are commonly tightly folded and sheared. The quartzite is in lenses 2–3 meters in thickness. It may contain a few percent muscovite alined in streaks to give a prominent north-plunging lineation. A west-plunging crinkle lineation is present in many of the schistose rocks. Mylonitic quartzite and quartz schist interlensed with the Ponaganset Gneiss in the southwestern corner and that between two branches of the Lake Char fault west of Torry Hill is probably pqs

pqsq — Mappable lens of quartzite. In this area quartzite is mylonitic. Contains 75–90 percent quartz and minor amounts of feldspar, muscovite, and biotite

pqsm — Dark-gray, very fine grained, well-layered rock. In this area pqsm is mylonitic and occurs as lenses within the mylonitic quartzite and quartz schist between two branches of the Lake Char fault. Much of the rock is quartz rich (50–75 percent), and contains lesser amounts of oligoclase, biotite, muscovite, epidote, and locally amphibole. Some rocks are strongly altered and contain abundant chlorite replacing the mafic minerals and calcite, sericite and epidote replacing plagioclase. Accessory minerals include sphene, opaque minerals, and apatite. Some rocks are uniformly very fine grained; others contain oligoclase clasts as much as 1.5 mm diameter in a very fine grained matrix; and still others contain streaks of very fine grains (less than 0.1 mm) alternating with slightly coarser grains (average about 0.2 mm)

pq — Fine- to medium-grained, light-gray to grayish-orange, massive to thinly layered quartzite and less abundant mica-quartz schist. Quartzite may contain minor muscovite, which, in the less massive rocks, forms thin partings. Accessory minerals include apatite, zircon, opaque minerals, and locally biotite. The thinly layered quartzite is most common near the top of the unit and consists of layers a few cm thick of muscovite quartzite which may be separated by discontinuous thin lenses of biotite-muscovite-quartz schist. Locally the rock is epidote-actinolite quartzite (as on the hill southeast of East Putnam, table 1, sample no. 7); actinolite needles are strongly oriented in the north-plunging lineation direction

ps — Fine- to medium-grained, very light gray to medium-gray and greenish-gray, biotite- muscovite-quartz schist (table 1, sample no. 8). Foliation planes may be stained grayish orange. The schists may contain minor plagioclase or, less commonly, minor microcline. Locally epidote and minor calcite are present; garnet is present in minor amounts in some schists. Other accessory minerals include apatite, sphene, rutile, tourmaline, zircon, and opaque minerals. The schist consists of laminae of quartzite a few mm thick alternating with mica-rich laminae. The laminae are commonly tightly folded and sheared

pql — Medium-grained, light-gray to pale-orange, commonly stained grayish-orange, massive to thickly layered quartzite. Rock commonly contains 80–90 percent quartz and minor amounts of muscovite, biotite, plagioclase, and potassium feldspar (table 1, sample no. 9). Accessory minerals are as in unit pq. The quartzite is poorly foliated and layered, but a weak foliation is formed by the small muscovite flakes. A prominent lineation is formed by corrugations, as much as 5 mm deep, on the foliation surface, and muscovite flakes are lined up along the ribs. The lineation parallels the regional north-plunging direction. Lesser amounts of biotite-muscovite-quartz schist, in which either mica may predominate, calc-silicate granulite, actinolite gneiss, hornblende gneiss, and amphibolite are interlayered.

pqls — Predominately micaceous schists with less abundant hornblende gneiss (table 1, sample no. 10) found southwest of Hemlock Ledges. Similar rocks along the stream north of Kentuck Ledges are not abundant enough to map separately. Kyanite was observed in the schist in one locality. The stringer of pqls? within the Hope Valley Alaskite Gneiss east of Hemlock Ledges is a dark-gray biotite-quartz-plagioclase gneiss with or without hornblende. The origin of this lens, which can be traced for about one mile, is uncertain, but it is most likely related to the mafic schists of the Plainfield Formation

BEDROCK EXPOSURES – Individual outcrops indicated by black-screen overprint and areas of abundant outcrops indicated by ruled pattern. Many small outcrops indicated only by a structure symbol

CONTACT – Approximately located; dashed where indefinite

THRUST FAULT – Dashed where approximately located; short dashed where indefinite. Sawteeth on upper plate. Faults are mapped on the basis of cataclasis of the rocks, which increases in intensity toward the fault contacts, and on the repetition of units and lithologies. Cataclasis is most intense along the Lake Char fault where most rocks are blastomylonites, and is pervasive, though less intense in the rocks of the Quinebaug Formation 2,000–3,000 feet above the fault. The cataclastic deformation dies out within a few hundred feet below the Lake Char fault except where subsidiary thrust zones produce locally intensified cataclasis. Movement on the Lake Char fault, and accompanying cataclastic deformation of the rocks, started prior to movement on the northwest-trending cross faults but was probably still active when cross faulting took place. Thus, increased displacement on the thrust fault accompanied by a thickening of the zone of mylonitization could take place between closely spaced cross faults, such as the two in the southern part of the quadrangle

U
D
HIGH ANGLE FAULT – Dashed where approximately located; short dashed where indefinite. U, upthrown side; D, downthrown side

OVERTURNED SYNFORM – Showing trace of axial surface and direction of plunge

25 10
AXIAL PLANE OF MINOR FOLDS – Showing bearing and plunge of fold axis. Map sense of folds shown where determined

PLANAR FEATURES

Intersection of two symbols is at point of observation

STRIKE AND DIP OF FOLIATION – Includes planar arrangement of minerals and compositional layering. Relationship of foliation to bedding of the metasedimentary rocks not determined, but in most of the noncataclastic rocks is probably parallel

25 Inclined
Horizontal
35 Gently folded

STRIKE AND DIP OF CATACLASTIC LAMINATION

20 Inclined
Vertical

LINEAR FEATURES

BEARING AND PLUNGE OF LINEATION – May be combined with foliation symbols at point of observation

10 Plunging mineral lineation
Horizontal mineral lineation
7 Fold axis and crinkle lineation

AREA OF INTENSELY MYLONITIZED ROCKS

STAUROLITE-KYANITE
METAMORPHIC ZONE NAME – Isograd boundaries between metamorphic zones have been cut out by the thrust faults. Mineral names along the faults indicate the probable metamorphic grade of the rocks on either side of the fault

8
SAMPLE LOCALITY – Showing number of sample for which mode is given in table 1

×
BOULDER CONCENTRATION LOCALITY – Boulder concentration of a given rock type used in determination of a map unit

TABLE 1. – Selected modal analyses of rocks from the Thompson Quadrangle[1]

Lithologic unit	pgn	pg	hv	sg	hvf	pqs	pq	ps	pql	pqls	qu	tr	tb	ts	ta
Sample number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Quartz	32.0	29.0	32.0	32.0	36.0	70.0	60.0	74	88.0	62.0	29.0	36.0	18.0	34.0	
Plagioclase	35	42	38	30	40	0.5		3	3	6	46	11	18	20	29
Microcline	29	0.6	28	33	19		10	2	2			11	13		
Biotite	3	19		4	1	5		5	0.1	8	22	11	21	36	1
Muscovite			2	1	[3]3	20		9	5	24				[3]1	
Amphibole[2]		X(H)					15(A)				2(H)				65(H)
Garnet	0.2		X		0.2	[4]						[5]28	30	5	
Sillimanite												2		0.5	
Epidote		6					14	6			0.5				
Accessory minerals	0.2	3	0.5	0.4	0.9	2	0.4	2	X	0.3	0.6	0.4	0.6	2	4
Alteration minerals	X	X		X	0.1	2	0.8		2	0.5				1	1
Approximate composition of Plagioclase	An_{20}	An_{18}	An_{10}	An_{12}	An_{8}					An_{20}	An_{35}	An_{25}	An_{30}	An_{28}	An_{43}

(All numbers are rounded off to the nearest percent except those less than 1 percent. X indicates present but less than 0.1 percent of the rock)
[1] Each mode is from one thin section.
[2] H = hornblende; A = actinolite.
[3] Muscovite is an alteration from feldspar or (in ts) sillimanite.
[4] No garnet in thin section; in hand sample scattered garnets as much as 1 cm in diameter.
[5] Thin section includes a garnet megacryst 2 cm in diameter; average garnet at this locality is closer to 10 percent.

Explanation
Ot – Tatnic Hill formation
Oq – Quinebaug formation
?pЄss – Scituate granite gneiss
?pЄsh – Hope Valley alaskite gneiss
?pЄsp – Ponaganset gneiss
?pЄm – Monson gneiss
?pЄp – Plainfield formation
?pЄpq – Quartzite in Plainfield fm

For sale by U.S. Geological Survey, Reston, Va. 22092, price $ 1.00