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This map set contains unpublished maps, cross- sections, and related information archived by the State Geological and Natural History Survey of Connecticut as part of the Survey Library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

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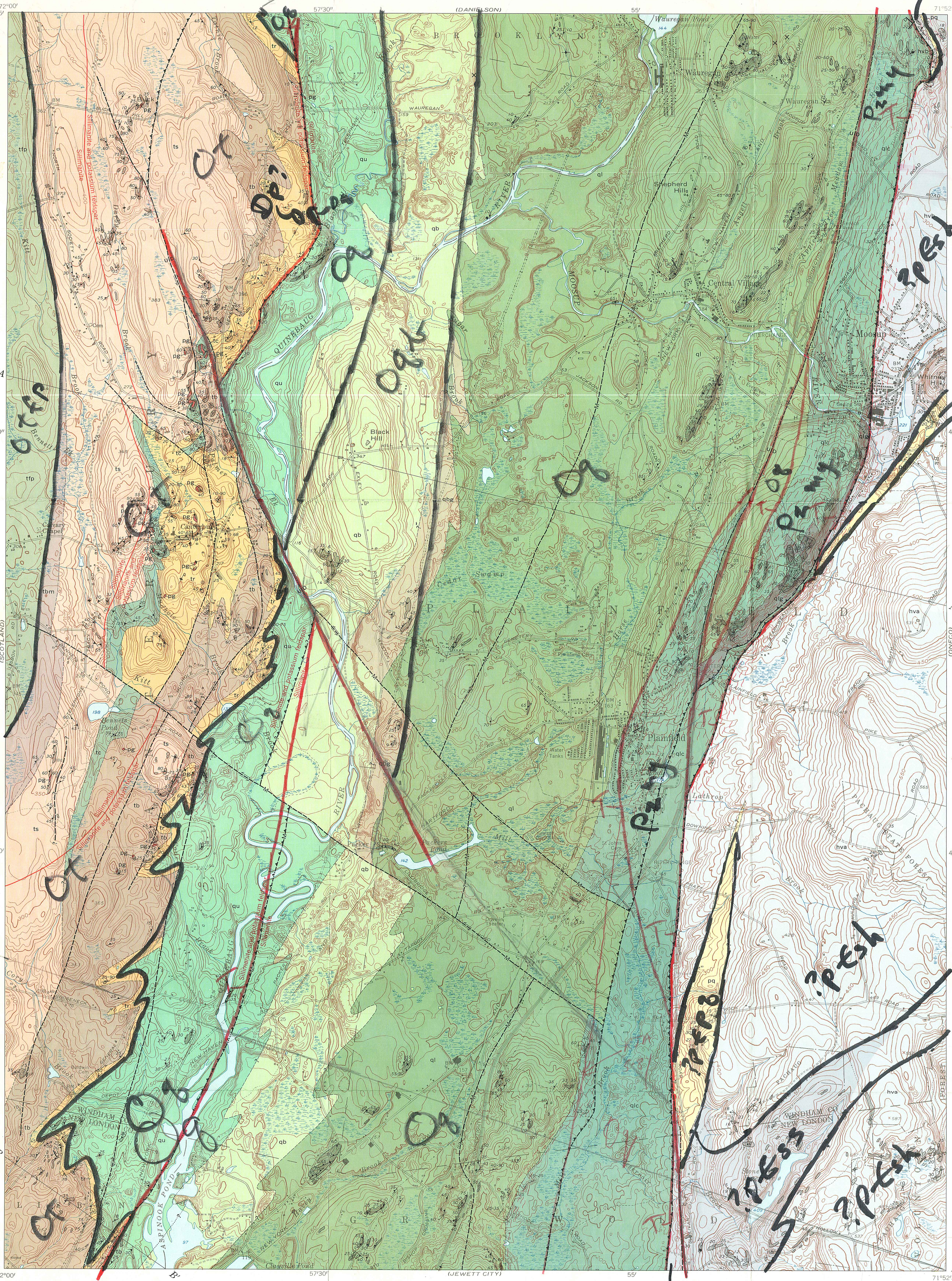
JH Interpretation geology 18, 20 July 1975

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH
THE STATE OF CONNECTICUT
GEOLOGICAL AND NATURAL HISTORY SURVEY

GEOLOGIC QUADRANGLE MAP
BEDROCK GEOLOGY
PLAINFIELD QUADRANGLE, CONNECTICUT
GQ-481



Base by U.S. Geological Survey, 1953

(NORWICH)

APPROXIMATE MEAN DECLINATION, 1965

SCALE 1:24 000

1 ½ 0 1 MILE

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL

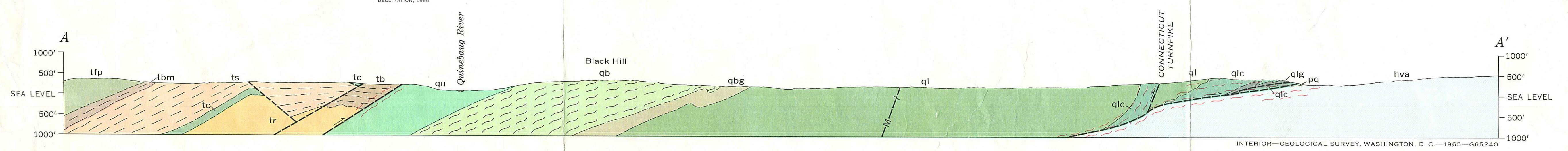
?pЄsh

CONNECTICUT

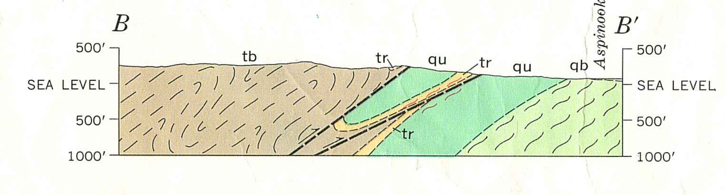
QUADRANGLE LOCATION

Geology mapped in 1961–62 by H. R. Dixon, assisted by B. Levin in 1961

(VOLUNTOWN)



INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D. C.—1965—G65240



E X P L A N A T I O N

Darker tones of respective colors indicate bedrock outcrops of the unit. Small outcrops on which structural data are recorded are indicated only by the structure symbols

In rock names given below, minerals are listed in a general order of abundance, with the least abundant mineral first. Minerals shown in parentheses are not always present in a given rock type

IGNEOUS ROCKS

POST-DEVONIAN

g

Gabbro

Coarse-grained, unfoliated, dark-gray hornblende-diopside-labradorite gabbro Grains up to 1 cm long. Occurs as small dike 0.25 mile northwest of mouth of Blackwell Brook; maximum exposed width of 5 feet, and exposed length of 50 feet. Rock shows no indication of recrystallization or metamorphism; it apparently post-dates orogenic activity in the area

pg

Pegmatite

Sills and dikes of coarse- to fine-grained rock varying in composition from granite to quartz diorite. Range from a few inches to tens of feet thick; in general only those greater than 5 feet in thickness, or individual outcrops consisting only of pegmatite are shown on the map. All are foliated; those near faults are cataclastic

hvb hva

Hope Valley(?) Alaskite Gneiss

hva, *light-gray to pink, medium-grained alaskite gneiss consisting of approximately equal amounts of quartz, microcline and oligoclase, and minor muscovite (locally abundant), biotite, sphene, magnetite, apatite, and allanite*

hvb, *medium-gray, medium- to fine-grained gneiss, similar to and gradational with* hva, *but containing 5 to 10 percent biotite. Where exposed in this area commonly cataclastic with sheared quartz and strained or broken feldspar in porphyroclasts as much as 1 cm in diameter; adjacent to the major thrust fault the rock is very fine-grained, hard, flinty, white to greenish mylonite*

METASEDIMENTARY AND METAVOLCANIC ROCKS

PRE-PENNSYLVANIAN

Putnam Group

tfp tbm ts tc tb tr

Tatnic Hill Formation

Metasedimentary rocks mixed with probable metavolcanic rocks at the base. Rocks in the sillimanite plus potassium feldspar metamorphic grade are marked by the intimate association of the two minerals; most of the muscovite present in these rocks appears to be retrogressive The eastern limit of the higher grade zone is difficult to determine because of local downgrading of the rocks by cataclasis near the faults, and because of the scarcity of aluminum-silicate minerals in the underlying Quinebaug Formation. Cataclasis varies in intensity from none to complete mylonitization. In most rocks cataclasis is evident only in quartz, which shows moderate to intense suturing of boundaries and strong undulose extinction. The strongly cataclastic rocks are very hard, dense, fine-grained mylonites or blastomylonites which contain porphyroclasts of coarse feldspar. In the vicinity of Canterbury, the stratigraphy in the lower part of the formation is complicated by apparent intertonguing of the various lithologies

tfp, *Fly Pond Member; non-resistant, medium-grained, thinly layered to massive, light- to medium-gray calc-silicate gneiss. Not exposed in the quadrangle, but is exposed in the Scotland quadrangle to the west, on the west side of the valley of Kitt Brook, and a few hundred feet north of the Plainfield quadrangle boundary*

tbm, *biotite-muscovite schist; medium-grained, dark-gray muscovite-biotite-oligoclase-quartz schist, with accessory garnet, epidote, apatite, zircon, potassium feldspar, and opaque minerals*

ts, *sillimanite gneiss; medium-grained, medium- to dark-greenish gray sillimanite-garnet-(muscovite)-biotite-andesine-quartz gneiss interlayered with fine-grained, dark-gray (garnet)-biotite-andesine-quartz gneiss. Accessory minerals include zircon, apatite, opaque minerals, epidote, and locally kyanite. Sillimanite is commonly altered to sericite and the rock is characterized by dark-green, resistant sericite pods on the weathered surface Potassium feldspar may be present in minor to major amounts; where abundant, it is commonly microcline*

tc, *calc-silicate gneiss; dark-gray medium-grained (diopside)-biotite-quartz-hornblende-andesine gneiss. Rocks similar to the Fly Pond Member. Commonly in sharp contact with adjacent rocks*

tb, *garnet-biotite gneiss; dark gray to black, medium-grained garnet-biotite-(potassium feldspar)-andesine-quartz schist interlayered with sillimanite or sillimanite-kyanite gneiss, amphibolite (probably about 10 percent of the unit), and small pods of calc-silicate gneiss. Garnet averages about 5 percent of the rock, but may be as much as 20 percent. Rock commonly contains megacrysts of garnet and plagioclase which average ½ inch in diameter, and locally megacrysts of a pink, clear potassium feldspar (probably orthoclase) up to 1 inch in diameter. Unit is gradational into the sillimanite schist above and the rusty-weathering schist below*

tr, *rusty-weathering schist; yellow to red weathering (medium-gray to black on fresh surface) medium- to fine-grained (biotite)-garnet-oligoclase-muscovite-quartz schist and sillimanite-garnet-muscovite-biotite-quartz-oligoclase schist. Kyanite occurs locally instead of or with sillimanite Graphite and sulfides are common accessory minerals; other accessories include rutile, zircon, and apatite. Secondary minerals are chlorite, sericite (some recrystallized to muscovite), and limonite. Amphibolites constitute about 25 percent of the unit; also contains interlayered pods of garnet-quartz granulite, garnet-biotite gneiss, calc-silicate gneiss and biotite-quartz-(pyroxene)-hornblende-andesine gneiss. Unit is apparently thicker locally in the vicinity of Canterbury village, where it appears to be conglomeratic*

qu qb qbg ql qlc qlg

Quinebaug Formation

Metavolcanic rocks and subordinate metasedimentary rocks, probably in the sillimanite grade of metamorphism. Aluminum-silicate minerals are rare, but sillimanite was noted at two localities in the lower member and the muscovite schist in the Black Hill Member contains sericite pods which may be after sillimanite. Metamorphic minerals include hornblende, diopside, and scapolite, and are consistent with sillimanite grade rocks. Most muscovite in the Black Hill Member appears to be primary metamorphic, suggesting that the rocks did not reach the sillimanite plus potassium feldspar grade of metamorphism. The effects of cataclasis can be seen microscopically in most of the rocks, and megascopically are locally obvious, except in the lower part of the section above the main thrust fault, where cataclasis is almost universal and is intense. The cataclasites show a strong mortar texture; quartz is strongly mosaicked, sutured, and strained; hornblende grains show broken, ragged boundaries, and with increasing intensity of cataclasis feldspars become broken, ragged, zoned, and crossed by strain exsolution lamellae. Along the main fault the rock is a dark-green to black, dense, flinty mylonite consisting of a very fine-grained aggregate of quartz, feldspar, clay, epidote, chlorite, and calcite

Upper member

qu, *medium- to dark-gray, greenish-gray, medium-grained, thinly-layered (quartz)-epidote-biotite-andesine-hornblende gneiss, (garnet)-(hornblende)-epidote-biotite-quartz-andesine gneiss, and layered amphibolite, ranging in size from blocks a few inches in diameter to pods a few feet thick. Scapolite is present locally, especially in the cataclastic rocks and may constitute as much as 20 percent of the rock. Accessory minerals include rutile, sphene, opaque minerals, zircon, and apatite. Knots of epidote are common; other knots contain various combinations of epidote, scapolite, hornblende, diopside, quartz, and plagioclase*

Black Hill Member

qb, *non-resistant, dark-gray, fine-grained, well-layered (calcite)-biotite-quartz-oligoclase schist interlayered with medium-gray to buff (garnet)-(biotite)-oligoclase-muscovite-quartz schist. Accessory minerals include epidote, opaque minerals, sphene, and apatite. Hornblende is present in some layers. The dark biotite schist appears to be the most common rock of the unit. Commonly shows intense, small scale folding*

qbg, *light-gray, fine-grained (calcite)-biotite-andesine-muscovite-quartz granulite interlayered with (diopside)-hornblende-biotite-andesine-quartz granulite. Probably lenses out to the north and south*

Lower member

ql, *light- to dark-gray, dark-greenish gray, medium- to fine-grained, well-layered epidote-biotite-quartz-andesine gneiss, epidote-quartz-biotite-andesine-hornblende gneiss, hornblende-biotite-epidote-andesine-quartz gneiss, epidote-microcline-quartz-biotite-andesine gneiss, and epidote-andesine-hornblende amphibolite. Accessory minerals include garnet, allanite, sphene, zircon, apatite, and opaque minerals. Secondary minerals include chlorite, muscovite, sericite, calcite, and epidote; these are primarily the result of cataclasis. Amphibolites are locally massive and up to 50 feet thick. However, amphibolites have not been mapped separately because lenses cannot be traced along strike beyond the outcrop. The most characteristic rock of the unit, though not the most abundant, is the dark- to greenish-gray biotite-andesine-hornblende gneiss, which contains hornblende grains up to 5 mm long. Small scale folds and faults are common, especially in the lower part of the unit; also common are tension joints filled with epidote or chlorite*

qlc, *intermixed hard, dense, dark-gray to black, fine-grained cataclasites and blastomylonites. Comparison of these rocks with probably equivalent, but not so intensely granulated rocks beyond this area suggest that porphyritic, or porphyroblastic, rocks mixed with hornblende-quartz-plagioclase granulites probably formed a distinct lithologic unit (possibly stratigraphic) prior to cataclasis, and granulation has emphasized pre-existing characteristics. The blastomylonites are epidote-biotite-microcline-plagioclase-quartz gneiss and epidote-hornblende-biotite-quartz-plagioclase gneiss. The former was probably an intrusive rock, and may be a part of* qlg. *The inter-mixed cataclasites are biotite-(hornblende)-epidote-quartz-plagioclase granulites. Scapolite may be present as a cataclastic mineral in addition to those listed above under* ql. *Plagioclase grains are strongly saussuritized and sericitized*

qlg, *apparently intrusive gneiss, now strongly cataclastic. Probable original composition was biotite quartz monzonite; now is pinkish-gray fine-grained epidote-chlorite-microcline-plagioclase-quartz mylonite and blastomylonite. May be younger than the Quinebaug Formation, but is included with the Quinebaug until it can be observed as a non-cataclastic rock*

CAMBRIAN(?)

pq

Plainfield Formation

Buff to light-gray, fine-grained, quartzite, and dark-gray, fine-grained epidote-quartz-plagioclase-hornblende granulite. In this area strongly cataclastic. Exposures in Ekonk Brook, below Whitney Hill are entirely quartzite; those south of Flat Rock Road are primarily hornblende granulite with minor quartzite

Contact

Long dashed where approximate; short dashed where inferred; queried where doubtful

70 35 M U D ?

Fault

Medium- to high-angle fault, showing bearing and plunge of slickensides; long dashed where approximately located; short dashed where inferred; queried where doubtful; M *indicates fault plotted on basis of aeromagnetic data. Arrows show apparent relative horizontal movement;* U, *upthrown side;* D, *downthrown side. Dip of fault plane shown where observed*

M

Thrust fault

Dashed where approximate; short dashed where inferred. Sawteeth on upper plate; M *indicates fault plotted on basis of aeromagnetic data*

30 U D 90

Inclined Vertical

Minor faults

Showing dip of fault plane where observed. Offset commonly a few inches to a few feet, and faults not traceable beyond outcrop. Arrows indicate relative horizontal movement; U, *upthrown side;* D, *downthrown side*

Areas of intensely mylonitized rocks

Sillimanite
Sillimanite and potassium feldspar

Mineral isograd

Grade change across fault indicated by mineral names on the fault

PLANAR FEATURES

Intersection of two symbols is at point of observation

25 20–60

Inclined Vertical Horizontal Gently folded

Strike and dip of foliation

Includes planar arrangement of minerals and compositional banding Relationship to bedding not determined, but in most cases is probably parallel

Explanation

10 30 80 30

Parallel Overturned Non-parallel

Strike and dip of foliation and bedding

20

Inclined Vertical Horizontal

Strike and dip of cataclastic foliation

Pzmy — Mylonite

Dp — Preston gabbro

Inclined Horizontal

Strike and dip of probable igneous foliation

Otfp Fly Pond member of Tatnic Hill fm.

75

Inclined Vertical

Strike and dip of joints

Ot — Tatnic Hill fm.

LINEAR FEATURES

Plunging Horizontal Slickensides on minor faults

Bearing and plunge of lineation

Commonly used in combination with bedding and foliation symbols, or fold symbols

Oq — Quinebaug fm.

FOLDS

?pЄss — Scituate granite gneiss

27 30 15 43 13 30

Inclined Vertical Vertical, without plunge

Axial plane of minor folds, showing bearing and plunge of fold axis

Map sense of folds shown where determined

?pЄsh — Hope Valley alaskite gneiss

Boulder concentration of one rock type used in determination of the presence of a unit

?pЄpq — Quartzite in Plainfield formation

65

Quartz vein, showing dip

BEDROCK GEOLOGIC MAP OF THE PLAINFIELD QUADRANGLE, WINDHAM AND NEW LONDON COUNTIES, CONNECTICUT

By
H. Roberta Dixon
1965

58

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