Watch Hill 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This map set contains unpublished maps, cross- sections, and related information archived by the State Geological and Natural History Survey of Connecticut as part of the Survey Library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 For many geographic areas, more current information exists, either in published or unpublished form.

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J R Interpretative geology 17 July 1975

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

GEOLOGIC QUADRANGLE MAP
BEDROCK GEOLOGY
WATCH HILL QUADRANGLE, R. I.-CONN.
GQ-655

SOURCE OF SAMPLES (TABLE 1)

Plainfield Formation:
- 1 Gneiss (€pg), medium-gray, medium-grained; road corner 74 on Old Shore Road, near northeast corner of quadrangle.
- 2 Schist (€pg), dark-gray to black, medium-grained; 950 feet S. 45° E. of road corner 74 on Old Shore Road, near northeast corner of quadrangle.

Metavolcanic rocks:
- 3 Gneiss (Ogg), light-gray, medium- to fine-grained, layered; mode on layer rich in biotite; from a layer in the pink gneiss (Ogp); 2000 feet S. 58° E. of BM 144 near Pawcatuck High School.
- 4 Gneiss (Ogg), light- to medium-gray, fine-grained; 800 feet S. 47° W. of BM 51 on West Broad Street, near northwest corner of quadrangle.
- 5 Gneiss (Ogg), light-gray, medium-grained; 800 feet due west of BM 144 near Pawcatuck High School.
- 6 Gneiss (Ogg), medium-gray, medium-grained; railroad cut 1400 feet southwest of Green Haven Road.
- 7 Gneiss (Ogg), light-gray, medium-grained, has "marble cake" structure; 3350 feet S. 30° W. of railroad crossing on Green Haven Road.
- 8 Gneiss (Ogg), schistose, layered, fine-grained; 450 feet N. 88° W. of BM 24 south of Certain Draw Point.
  - 8a. Light-gray layer
  - 8b. Dark-gray layer
- 9 Gneiss (Oq), dark-gray to black, medium- to fine-grained, schistose; along shore 1200 feet S. 28° W. of BM 24 south of Certain Draw Point.
- 10 Quartzite (Oq), light-gray, medium-grained; along west shore of Pawcatuck River at BM 21.
- 11 Sillimanite schist (Oq), silvery-gray, medium-grained, along shore 1200 feet S. 28° W. of BM 24 south of Certain Draw Point.
- 12 Gneiss (Ogp), light-pink, medium- to fine-grained; 550 feet S. 65° E. of BM 51 on West Broad Street.
- 13 Gneiss (Ogp), flesh-colored, fine- to medium-grained; 1750 feet S. 52° E. of BM 144 near Pawcatuck High School.
- 14 Gneiss (Ogp), flesh-colored to light-gray, fine-grained; 1400 feet S. 36° E. of BM 144 near Pawcatuck High School.
- 15 Gneiss (Ogp), grayish-pink, fine-grained; 4450 feet S. 71° E. of road corner 134 in the eastern part of Westerly.
- 16 Gneiss (Ogp), light pinkish-gray, fine-grained; at BM 59 west of Stanton Weir Point.

Narragansett Pier Granite:
- 17 Quartz monzonite (IPn), light pinkish-gray, medium- to coarse-grained, porphyritic; 2300 feet N. 72° W. of intersection of Pound Road and Old Shore Road.
- 18 Quartz monzonite (IPn), light-pink, coarse-grained, porphyritic; quarry near northeast corner of quadrangle, 6200 feet N. 79° E. of intersection of Pound Road and Old Shore Road.

Westerly Granite:
- 19 Quartz monzonite (IPw), light-gray, fine-grained; north center side of abandoned quarries at east edge of Westerly.

Mafic dike:
- 20 Limburgite porphyry (TRd), dark-gray to black, aphanitic, porphyritic with olivine phenocrysts; exposed in the abandoned quarries at east edge of Westerly.

TABLE 1. MODES OF ROCKS FROM THE WATCH HILL QUADRANGLE[1]

Mineral	1	2	3	4	5	6	7	8a	8b	9	10	11	12	13	14	15	16	17	18	19	20
Microcline	7.8	T[3]	10.9	11.7	13.3	8.3	11.0				0.6	10.9	40.6	27.2	27.1	23.8	24.7	34.9	27.9	26.7	
Plagioclase	46.4	23.6	44.6	45.0	46.7	56.2	48.1	60.0	45.4	26.9	12.6	2.7	28.7	31.7	32.7	36.5	38.1	34.4	34.7	41.9	
Quartz	35.6	3.7	30.4	33.7	30.6	22.4	27.4	1.0		36.7	78.4	53.9	27.8	38.1	34.6	34.7	33.3	25.0	29.2	23.2	
Biotite and Chlorite	8.2	23.7	12.9	7.0	2.9	7.4	7.5	21.2	4.6	28.7	6.9	8.9	1.7	2.2	3.4	3.2	2.6	3.3	5.9	5.7	3.7
Muscovite	0.6			1.1	T						1.0	3.1	0.3	0.5	0.8	1.1	T	1.4	T	0.3	
Olivine																					22.9
Pyroxene																					33.1
Hornblende		48.5			4.9	4.0	4.0	5.8	48.6	5.4											3.3
Magnetite	T		T	T	T	T	1.3		T	T			T	T	T	T	T	T	T	T	3.6
Ilmenite-leucoxene					T				T					T							T
Sphene	T		T	T	T	T	T	T					T					T		T	
Zircon	T	T	T	T	T	T	T		T	T	T	T	T	T	T	T	T	T	T	T	
Apatite	T	T	T	T	T	T	T	T	T	T	T		T	T	T	T	T	T	T	T	
Tourmaline	T											T									
Spinel(?)																					T
Allanite			T		T		T	T	T	T	T		T	T			T	T	T	T	
Epidote			T		T	T		T	T	T	T	T	T			T	T	T	T	T	
Pyrite-hematite		T								1.0	T	T	T								
Garnet										0.4		T			T		0.4				
Sillimanite								8.8				19.1									
Devitrified glass(?)																					16.3
Sericite	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	
Calcite			T	0.3	T	T							T		T					T	1.5
Chalcedony																					0.6
Serpentine																					13.1
Unknown																					1.9
Total Accessories[2]	1.4	0.5	1.2	1.2	1.6	1.7	0.7	3.2	1.4	0.9	0.5	1.4	0.9	0.3	1.4	0.7	0.9	1.0	2.4	2.2	
Composition of plagioclase	An_{28}	An_{41}	An_{28}	An_{25}	An_{25}	An_{21}	An_{23}	An_{50}	An_{50}	An_{81}	An_{75}	An_{21}	An_{19}	An_{18}	An_{23}	An_{22}	An_{17}	An_{21}	An_{23}	An_{19}	

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[1] Each mode is from one thin section

[2] Exclusive of those for which percentage is reported separately

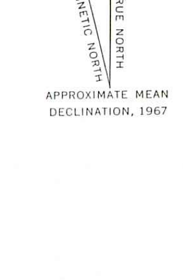
[3] T-Trace

41°15'
71°52'30"
50'
47'30"
41°15'
71°45'

INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D.C.—1967—G67029

Base by U.S. Geological Survey, 1953

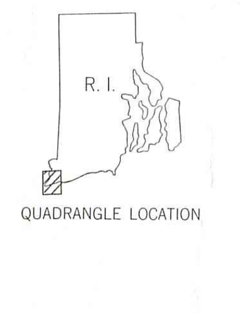
Geology mapped in 1958–1959



APPROXIMATE MEAN DECLINATION, 1967

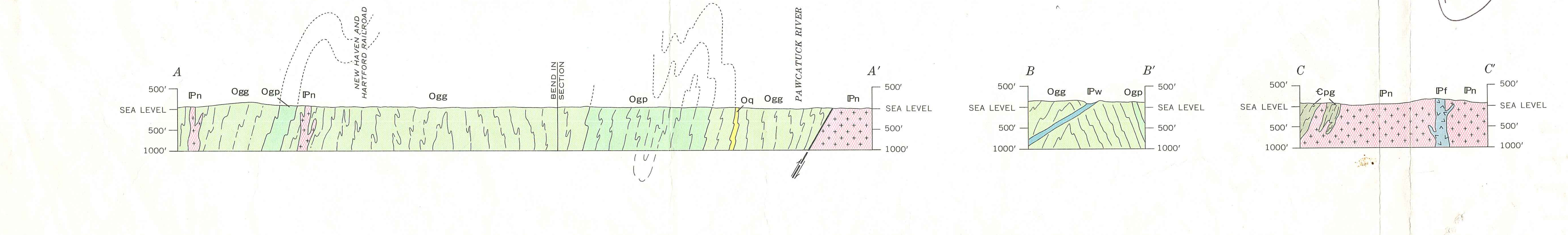
SCALE 1:24 000
1 ½ 0 1 MILE
1 .5 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL
DEPTH CURVES IN FEET—DATUM IS MEAN LOW WATER
SHORELINE SHOWN REPRESENTS THE APPROXIMATE LINE OF MEAN HIGH WATER
THE AVERAGE RANGE OF TIDE IS APPROXIMATELY 2.5 FEET



QUADRANGLE LOCATION

(104)



BEDROCK GEOLOGIC MAP OF THE WATCH HILL QUADRANGLE WASHINGTON COUNTY, RHODE ISLAND AND NEW LONDON COUNTY, CONNECTICUT

By

George E. Moore, Jr.

1967

EXPLANATION

TRd

Mafic dike

A dark porphyritic dike, as much as 6 feet wide. Outer part is altered to soft soapy olive-gray, limonite-stained, serpentine-rich rock. Central part is black limburgite porphyry containing a few phenocrysts of pigeonite (?) and 20 to 25 percent phenocrysts, 1 to 5 mm long, of pale-green olivine, partly altered to serpentine, set in an aphanitic matrix. Most of the matrix is slightly serpentinized pigeonite (?) laths and olivine, commonly 0.1 to 0.2 mm long, and scattered magnetite in a devitrified glass (?) composed of unidentified material of low birefringence. Matrix also contains about 15 percent oval to irregularly shaped brown areas, as much as 5 mm in diameter, composed of red-brown oxyhornblende, red-brown biotite, calcite, pigeonite (?), and devitrified glass (?) that probably represent material crystallized late in the cooling history of the dike; patches of light-green chalcedony as much as 2 mm in diameter; and 1 to 2 mm patches of an unknown white isotropic mineral that has a refractive index of about 1.514

TRIASSIC (?)

IPw

Westerly Granite

Light-gray and locally light-pink, fine-grained granite of magmatic origin. Generally massive, but in places it has a very weak foliation marked by parallel biotite flakes. Mostly equigranular; some is subporphyritic containing 1 to 2 percent subhedral to euhedral plagioclase phenocrysts as much as 5 mm long. In small bodies and locally along margins of larger bodies, contains elongate euhedral biotite as much as 12 mm long. Main constituents are quartz with undulatory extinction; subhedral plagioclase, some of which shows zoning with gradational borders between zones; interstitial and subrectangular grains of microcline; and 2 to 7 percent biotite. Some of the coarser microcline is perthitic, and some of the plagioclase has narrow rims of albite along plagioclase-microcline grain boundaries. Most of this granite occurs in dikes that strike east and dip 25° to 30° S. Locally cut by quartz veins and narrow dikes of pegmatite, aplite, and fine-grained pink and gray granite

IPf

Fine-grained granite

Pink to light-gray fine-grained granite of magmatic origin, massive or weakly foliated parallel to walls of body. Main constituents are quartz, feldspar, and 1 to 2 percent biotite. Many small bodies of IPf *are too small to show at the scale of the map. Probably is related to* IPn *or is the equivalent of* IPw

IPn

Narragansett Pier Granite

Pink, flesh-colored, and pinkish-gray granite of magmatic origin, emplaced after metamorphism of the metavolcanic rocks. Medium to coarse grained in large bodies and fine to medium grained in small bodies. Equigranular to porphyritic; contains as much as 15 percent pink, white weathering, euhedral microcline and plagioclase phenocrysts, commonly 15 to 25 mm long but some are 40 mm long. Massive, but is foliated and streaked near inclusions and contacts of body. Main constituents are pink microcline, the larger grains of which are microperthitic; well twinned white plagioclase much of which is altered to sericite, and some grains have narrow rims of albite along plagioclase-microcline grain boundaries; smoky quartz with undulatory extinction; and 1 to 6 percent biotite. Cut by many small dikes and pods of pegmatite, aplite, fine-grained pink granite, and by the Westerly Granite, IPw. *Many sills, dikes, and irregular bodies of* IPn *are too small to show at the scale of the map. Secondary foliation shown by symbols on the map in* IPn *was measured on foliation in, and long dimensions of, inclusions of gneiss and schist*

PENNSYLVANIAN OR YOUNGER

Oq Ogp
Ogg Ogp

Metavolcanic rocks

Ogg, *Gray layered gneiss. Mostly medium- to light-gray medium- to fine-grained quartz-feldspar-biotite gneiss, some layers contain minor amounts of hornblende and others contain metacrysts of pink and white feldspar as much as 10 mm long; generally contains 6 to 12 percent dark minerals. The gneiss is foliated and locally lineated and in the western part of the area shows "marble cake" structure. Some distinctly layered gneiss consists of alternating dark-gray to black medium-grained biotite-hornblende-quartz-feldspar schist and gneiss alternate with fine- to coarse-grained hornblende-feldspar-biotite schist and gneiss, that contains epidote. Main constituents are quartz, oligoclase to andesine-labradorite with well-developed polysnthetic twinning, biotite, hornblende, and microline. Unit is cut by many small bodies of granite, aplite, and pegmatite. The xenolith of* Ogg *near Weekapaug Point contains veins and pods of coarse-grained minerals, among which are hornblende, actinolite, diopside, epidote, scapolite, andesine, biotite, pyrite, and quartz*

Ogp, *Pink layered gneiss. Pink, flesh-colored, and very light-gray fine- to medium-grained quartz-oligoclase-microcline-biotite gneiss, generally contains 2 to 4 percent biotite and a trace of muscovite and euhedral to anhedral magnetite. Oligoclase commonly has narrow albite rims along grains bounded by microcline. Foliation, marked by biotite and lens-shaped aggregates of quartz and feldspar, is well developed in most of the rock and is parallel to compositional layering; lineation generally is weakly developed. Compositional layering is locally shown by alternating quartz-rich and plagioclase-rich folia and, especially near the contacts with* Ogg, *by alternating beds of light- to dark-gray medium-grained quartz-feldspar-biotite gneiss and dark-gray hornblende-biotite-quartz schist. Unit is cut by many thin sills and irregular bodies of granite, aplite, and pegmatite*

Oq, *Interbedded rusty-weathering medium-grained vitreous quartzite and quartz-mica schist in beds as much as 12 feet thick that locally contain much sillimanite; medium- to fine-grained dark-gray and light-gray gneiss with varied amounts of hornblende, biotite, plagioclase, microcline, and quartz; dark-gray to black hornblende schist; and light-green actinolite schist and quartz-feldspar-actinolite-chlorite schist. Foliation and lineation are well developed; bedding and foliation are generally parallel; sillimanite is fibrous to euhedral. Unit is cut by small bodies of light-gray pegmatite, pink pegmatite, granite, and aplite*

ORDOVICIAN(?)

€pg

Plainfield Formation

Lithologically varied but mostly medium- to dark-gray medium-grained foliated and lineated quartz-feldspar-biotite gneiss and feldspathic schist in which adjacent folia range from medium- to dark-gray containing as much as 20 percent biotite, to light-gray and flesh-colored containing as little as 2 percent biotite. Light-gray to pink subhedral feldspar and lens-shaped augen of medium- to fine-grained feldspar and quartz as large as 12 by 20 by 60 mm locally constitute as much as 15 percent of some beds; biotite tends to wrap around the augen; lineation is produced by aligned augen and by aggregates of elongated biotite flakes. Other rock types include beds of lineated dark-gray to black medium-grained hornblende-biotite-feldspar schist as much as 15 feet thick, and thin beds of light-gray quartzose schist and dark-gray quartz-feldspar-biotite-hornblende gneiss; local dark lenses of biotite with minor amounts of feldspar and quartz are as large as 25 by 75 by 300 mm. Main minerals are quartz, oligoclase or andesine, microcline, biotite, and hornblende. Contact with the Narragansett Pier Granite is very irregular; feldspathic inclusions of Plainfield in the granite are abundant and locally contain metacrysts of pink microcline averaging about 20 mm long. The Plainfield contains many small bodies of granite IPn *and pegmatite*

CAMBRIAN(?)

Bedrock outcrops

Solid color represents individual outcrops; ruled areas represent individual outcrops or groups of closely spaced outcrops

Contact

Dashed where approximately located; short dashed where indefinite; dotted where concealed by water

U
D

Fault

Dashed where approximately located; short dashed where indefinite; dotted where concealed by water. U, *upthrown side;* D, *downthrown side*

Anticline

Showing approximate position of crestline and direction of plunge

PLANAR FEATURES AND LINEAR FEATURES

50

Strike and dip of primary foliation

70 80

Vertical | Inclined | Horizontal | Inclined (read at outcrop no longer accessible)

65

Crenulated, vertical | Crenulated, inclined

Strike and dip of secondary foliation

60 60

Inclined | Vertical | Crenulated, inclined

Strike and dip of parallel bedding and secondary foliation

45

Bearing and plunge of mineral lineation

30
50

Strike and dip of axial plane of minor fold, bearing and plunge of minor fold axis, and pattern of fold projected into horizontal plane

10

Bearing and plunge of minor fold axis, and pattern of fold

Abandoned quarry

12

Specimen locality

Numbers correspond to those in the table

(?p€s - Sterling plutonic group)

?p€sph - Potter Hill granitic gneiss

?p€mm - Mamacoke member of Monson gneiss

?p€pq - Quartzite in Plainfield fm.

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