

Bedrock geologic map of the
South Coventry quadrangle, Tolland County, Connecticut

by

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The South Coventry quadrangle contains parts of three stratigraphic sequences separated by faults across which no stratigraphic correlation has been possible. These are the Bronson Hill anticlinorium, the Merrimac synclinorium and the Willimantic dome sequences. Each sequence also is internally complicated by faulting, with pervasive cataclasis, and by intraformational folding.

The Bronson Hill anticlinorium sequence has been traced from New Hampshire, where it was first worked out by Billings (1937) southward across Massachusetts and into eastern Connecticut. Of the six formations described by Billings only the oldest, the Monson Gneiss, is exposed in the South Coventry quadrangle.

The Merrimac synclinorium sequence is a thick homoclinal sequence conspicuous for the uniformity of its north-northeast trending strike and relatively steep westerly dip in the Stafford Springs (Pease, 1975), Westford (Peper and Pease, 1975) and Eastford (1972) quadrangles to the north and northeast. Steeply dipping thrust faults, subparallel to the strike and dip, disrupt the continuity of the stratigraphic sequence. Two of these, the Kinney Pond and Black Pond faults, form the boundaries between the Bigelow Brook and Hamilton Reservoir Formations and the Southbridge and Bigelow Brook Formations respectively.

1 The Kinney Pond fault flattens and bends sharply just south of
2 the Westford quadrangle to cross the South Coventry quadrangle in a
3 westerly direction. It abruptly terminates the conspicuous north-
4 northeast trending structures restricting these to the northern quarter
5 of the South Coventry quadrangle. The Black Pond fault also bends
6 sharply east of the South Coventry quadrangle and essentially bisects
7 the quadrangle in an east to west direction. The two faults bound a
8 chaotic fault block complex of Bigelow Brook strata.

9 Merrimac synclinatorium rocks south of the Black Pond fault belong
10 to the Southbridge Formation with the exception of a fault bounded
11 block of the Bigelow Brook Formation near the western border of the
12 quadrangle just south of the fault. Structural continuity within the
13 Southbridge is sufficient to permit delineation of several mappable
14 lithologic units. The Merrimac synclinatorium sequence is separated
15 from the Willimantic dome sequence by the westerly trending/^{Lake}Wangumbaug
16 fault.

The stratigraphic sequence exposed in the Willimantic dome consists of the Hebron Formation and the underlying Putnam Group (Dixon, 1964) which includes the Tatnic Hill Formation underlain by the Quinebaug Formation. The Willimantic Gneiss forms the core of the dome. A thick sheet-like body of Canterbury Gneiss forms the foot wall of the Wangumbaug fault in the eastern part of the quadrangle; near Lake Wangumbaug it bends southward away from the fault and intrudes strata of the Hebron Formation. Just north of the village of South Coventry stringers of the Yantic are incorporated in the base of the Canterbury.

The Willimantic Gneiss and overlying Quinebaug Formation are lithologically most similar to rocks exposed south of the Honey Hill Fault; the Willimantic dome may represent a window of older rocks exposed beneath a low angle thrust within the base of the Tatnic Hill Formation. This thesis was suggested by R. F. Winsch (1976) who describes tectonically rotated blocks as much as 10 x 30 x 30 at and near the base of the Tatnic Hill Formation. Abundant shearing, cataclasis and asymmetric folding is apparent between rotated blocks; mylonite and ultramylonite are present locally. Similarly rotated tectonic blocks are common in the Bigelow Brook Formation exposed between the Kinney Pond and Black Pond faults.

Lithologies, thicknesses and distribution of the various stratigraphic units within the South Coventry quadrangle are described below.

Bronson Hill Anticlinorium Sequence

West of the Bonemill Brook Fault

On **Monson Gneiss -- Chiefly banded light- to medium-grained thickly layered granitic quartz feldspar biotite gneiss. Hornblende is present but minor in the granitic gneiss, but dark-gray hornblende-rich gneiss, locally containing garnet is interlayered with the lighter gray gneiss. These amphibolitic layers are thinly laminated to massive and vary in thickness from a few centimeters to several meters; they amount to less than 15 percent of the formation. The Monson lies west of the Bonemill Brook fault in the northwest corner of the quadrangle; it is best exposed in the town of Tolland on the hill north of I-86 and Route 195 intersection.**

Merrimack synclinorium sequence

Hamilton Reservoir Formation

The Hamilton Reservoir Formation, named for a thick sequence of schist and gneiss in the Stafford Springs and Westford quadrangles (Peper et al, 1975), is divided into 5 members, 3 schist members separated by 2 gneiss members. In the South Coventry quadrangle the formation lies in a northeast trending outcrop belt, bounded on the west by the Bonemill Brook fault, and cut off to the south by the Kinney Pond fault.

SDhus Hamilton Reservoir Formation -- Upper Schist Member -- Inter-layered reddish- to orangish-gray weathering aluminous gneiss, rusty-brown to yellowish-gray weathering sulfidic aluminous schist and subordinate amounts of light-gray weathering quartzo-feldspathic gneiss. The aluminous gneiss layers range from 1 cm to 5 m thick and consist mostly of quartz and plagioclase with biotite, sillimanite, garnet and other sulfide. The schist particularly where highly sulfidic is recessed between or beneath gneiss exposures. It weathers readily in road cut outcrops, and is believed to amount to at least 30 percent of the member though largely not exposed. The sulfidic schist occurs as paper-thin folia in aluminous gneiss or as layers 1 cm to 5 m thick. The schist contains platy sulfide and graphite along foliation planes and on fractures, is rich in sillimanite, garnet and biotite; cordierite is present locally. The quartzo-feldspathic gneiss

resembles the gray-aluminous gneiss but layers rich in biotite are more common, garnet is rare and sillimanite and sulfide are lacking. Other diverse rock types dispersed throughout the member but too thin to map separately include: brown weathering, fine-grained, thinly layered, quartz-plagioclase-biotite-brown amphibole gneiss; light-gray to greenish-gray-quartz-plagioclase-diopside-green amphibole, calc-silicate gneiss, and thinly bedded dark-gray to black amphibolite. The last two are more abundant towards the base. Gneissoid pegmatite is abundant and chiefly parallels the foliation, but locally is cross cutting.

Representative exposures of the member in the quadrangle are situated in a housing development north of Metcalf Brook and east of the Bonemill Brook fault. The upper part is cut out by the Bonemill Brook fault; the base is gradational into the Upper Gneiss Member as reddish-orange gneiss and aluminous schist, characteristic of the Upper Schist Member, become less abundant. The maximum exposed thickness of the Upper Schist Member in the South Coventry quadrangle is about 550 m.

SDhugg Hamilton Reservoir Formation -- Upper Gneiss Member -- Chiefly
light-gray to dark-gray, medium-grained quartz-feldspar-biotite-
garnet-muscovite gneiss. Light-gray felsic gneiss predominates at
the top with darker gray, more biotite rich gneiss becoming more
prominent toward the base. Member includes thin partings of
reddish-orange weathering, sulfidic aluminous schist, beds of
brownish-gray, thinly layered, fine-grained, brown-biotite granular
schist, greenish-gray, green-hornblende calc-silicate gneiss,
thinly layered plagioclase-hornblende amphibolite and fine-grained,
thinly bedded felsic gneiss. The Upper Gneiss Member is approxi-
mately 675 m in maximum thick^{ness}; it is poorly exposed in the map area.
A good exposure occurs in the stream valley 400 m northeast of
intersection of Anthony Road and South River Road. The lower
contact is not exposed, but the member contains progressively more
sulfidic schist towards the base and the contact is considered to
be gradational. The member is not exposed on the east side of the
fault in the Willimantic River valley; its position is extrapolated
from exposures in the Stafford Springs quadrangle.

SDhms Hamilton Reservoir Formation -- Middle Schist Member -- Mostly
light-gray to rusty-brown and reddish-orange, medium-grained,
quartz-feldspar-biotite-sillimanite-garnet-schist. Characteristic
of this member is highly sulfidic and garnetiferous sillimanite-
rich schist that weathers readily to yellowish-gray, rusty-brown
friable soil. Garnets are 1 mm to 4 cm in diameter; they are
lavender when fresh but weather to form rusty clots that stain
outcrop surfaces reddish orange. Conspicuous sillimanite pseudo-
morphs after kyanite as much as 1 x 2 cm long are common. West of
the Willimantic River, muscovite is common. Cordierite and
graphite are present but sparse. This rusty weathering schist
occurs in layers 1 cm to 30 m thick; it is interleaved with well
bedded, medium-grained, light to dark-gray, aluminous schist and
gneiss layers which vary in thickness from 1 cm to 50 cm; strongly
foliated, light-gray quartz-plagioclase-biotite gneiss of probable
metavolcaniclastic origin are locally present but too small to map.
Thinly-layered, fine-grained greenish-gray calc-silicate gneiss
commonly occur in outcrop as resistant lenses 2 to 10 cm thick.
Foliated pegmatites as much as 5 meters thick are common. The
maximum thickness of the Middle Schist Member is about 675 m in
the South Coventry quadrangle; it thickens to about 2000 m in the
Stafford Springs quadrangle (Pease, 1975). It is well exposed in
a 3 km-long northeast trending belt east of Halls Pond; the lower
contact is marked by a persistent sulfidic schist.

SDhlgg Hamilton Reservoir Formation -- Lower Gneiss Member --

Predominately thinly layered, fine-grained, granular, light-brownish-gray to olive-brown, brown biotite schist commonly containing clinopyroxene altering to pale brown amphibole, interlayered with medium-grained, light to dark-gray, quartz-oligoclase-biotite gneiss. The gneiss is more resistant than the biotite schist giving outcrops a ribbed weathered surface. The brown granular biotite schist is less abundant northward in the Stafford Springs quadrangle where gray quartz-feldspar gneiss predominates. The Lower Gneiss Member rests conformably beneath the Middle Schist Member in the northeast quadrant of the map area. The member is about 900 m thick in this quadrangle, in the Stafford Springs quadrangle and northward it thins to less than 700 m. It is well exposed on the northeast trending ridge between Halls Pond and Luchon Road.

Rock units mapped within the Lower Gneiss Member

SDhlgga Amphibole gneiss -- Thinly layered, black hornblende schist and gneiss with minor calc-silicate bearing gneiss. Unit exposed approximately 675 m above the base of the member in the northeast corner of the South Coventry quadrangle; can be traced northward into the Stafford Springs quadrangle.

SDhlggs Sulfidic Schist -- Lens of rusty-brown weathering, medium-grained, quartz-feldspar-biotite-garnet-graphite-sulfide schist. Lavender garnets 5 mm to 5 cm in diameter are common. Lithology closely resembles Middle Schist Member, but stratigraphic position is within the Lower Gneiss Member about 150 m above the base. Maximum thickness is about 180 m, thins northward and pinches out in the Stafford Springs quadrangle but crops out again at western border of Westford quadrangle (Peper, 1975).

SDhls Hamilton Reservoir Formation -- Lower Schist Member -- Upper

two thirds of member is chiefly rusty-brown to reddish-orange weathering quartz-oligoclase-garnet-biotite-sillimanite gneiss and schist with thin felsic gneiss interlayers. The felsic gneiss comprises about 20 percent of this part of section. Sulfidic schist layers are common but not as pervasive or thick as in the Middle Schist Member. Lavender garnets, 4 mm to 8 cm in diameter, are abundant. The lower part of the member is chiefly reddish orange weathering felsic gneiss; gray weathering, garnetiferous, sillimanite rich gneiss comprises 25 percent of the lower part and becomes more common toward the base. Paper thin to 5 m thick, lentils of calc-silicate gneiss are common. The Lower Schist Member crops out in the northeast corner of the quadrangle and is cut off by the Kinney Pond Fault to the south. Representative exposures of the member are located in the valley north of Willington Hill north of Route 44, and on the ridges between Eldridge Brook and Clint Eldridge Road. The base of the Lower Schist Member is cut out by the Kinney Pond Fault.

The Hamilton Reservoir Formation is believed to lie stratigraphically above and to be conformable with the Bigelow Brook Formation although the mapped contact between the two formations is everywhere a fault. It is assumed that stratigraphic displacement is minimal on the Kinney Pond fault where it trends sub-parallel to the foliation to the northeast because changes in rock type across the fault are minimal and there is no apparent change in metamorphic grade.

Bigelow Brook Formation

The Bigelow Brook Formation (Peper, et al, 1975) underlies the Hamilton Reservoir Formation in the Eastford (Pease, 1972) and Westford (Peper, Pease, 1975) quadrangles to the northeast, bounded on the northwest by the Kinney Pond Fault and on the southeast by the Black Pond Fault. The formation consists of 3 members; an upper rusty-weathering sillimantic schist and gneiss member and a lower gray-weathering sillimanite gneiss, separated by a distinctive calc silicate bearing granular schist member. The Bigelow Brook Formation is undivided in the South Coventry quadrangle as the distinctive calc-silicate schist does not extend into the quadrangle.

SDB Bigelow Brook Formation -- The Bigelow Brook Formation is composed mostly of gray weathering fine- to medium-grained quartz-feldspar-biotite-garnet-sillimanite gneiss and schist and includes conspicuous layers 1 cm to 10 meters thick of amphibolite and calc-silicate bearing granular schist comprising about 20 percent of the formation. It differs from the Hamilton Reservoir Formation in that rusty weathering, sulfidic schist and gneiss are less conspicuous and calc silicate bearing gneiss lenses are more common. Sulfidic schist layers are too thin and too poorly exposed in the South Coventry quadrangle to be mapped except for mapped unit, SDbss, exposed on route 32 in the town of Merrow. Sulfidic schist sections of comparable thickness are more common in the Bigelow Brook Formation further north. Rock types characteristic

of the gneiss members of the Hamilton Reservoir but too thin to map in the South Coventry quadrangle are: well foliated, thinly layered brown-biotite granular schist 3-15 cm thick, massive brownish-gray clinopyroxene bearing gneiss 4 cm - 3 m thick, light-gray gneiss as much as 1 m thick composed almost entirely of quartz and feldspar and inter-layered fine-grained quartzite and brown-biotite schist. The Bigelow Brook Formation occurs in the South Coventry quadrangle in an east-west trending belt bounded by faults. All of the rocks in this belt have suffered varied amounts of cataclasis; locally cataclasis has formed a prominent east-west cleavage. The abundance of faults, certainly many more than mapped, prevents any reliable measurement of the thickness.

Rock units mapped in the Bigelow Brook Formation

SDBG

SDBG Banded gneiss -- Light gray, quartz-plagioclase-biotite gneiss alternating with medium-grained plagioclase-hornblende-garnet amphibolite. Rock is extremely contorted in all exposures; boudins of amphibolite and calc-silicate gneiss as large as 1 m are present.

SDBSS Sulfidic Schist -- Reddish-orange to yellowish-gray weathering, medium-grained, quartz-feldspar-biotite-garnet-sillimanite-graphite schist. Sulfide is pervasive throughout the unit. - Lithology closely resembles the Middle Schist Member of the Hamilton Reservoir Formation. The schist is approximately 80 meters thick and is well exposed on Route 32 in Merrow opposite a trailer park. It could be traced eastward no more than 600 m and on the west it is cut off by a fault.

Southbridge Formation

The Southbridge Formation occurs in a westerly trending belt, bounded on the north by the Black Pond Fault and on the south by the Wangumbaug Lake Fault. The two member division of the formation mapped in the Eastford quadrangle (Pease, 1972) has not been extended into the South Coventry quadrangle, but seven rock units have been delineated. These are: an amphibolite unit, SDsa, an aluminous schist unit, SDss, and five calc-silicate units, SDsc₁-SDsc₅. The lower calc-silicate units SDsc₁ and SDsc₂, lie south of the Lee Brook Fault; the remaining units are north of the fault. None of the mappable units within the formation can be correlated across this fault in the South Coventry or Spring Hill quadrangles. The apparent stratigraphic thickness of the formation in this quadrangle as measured is about 3200 m but sections have been repeated and cut out by numerous faults so that this measured thickness may be high or low by an order of magnitude.

1 SDs Southbridge Formation -- Mostly medium-grained, light-gray to
2 greenish-gray, well bedded, quartz-plagioclase-biotite schist.
3 Muscovite is rarely present. Layering varies from paper thin to
4 5 cm; layers 2 - 10 cm thick of light-gray, medium-grained
5- flaggy gneiss composed almost entirely of quartz and plagioclase
6 are interleaved with the schist. Calc-silicate minerals chiefly
7 diopside and green amphibole, are commonly present in trace
8 amounts. About 30 percent of the formation consists of greenish-
9 gray layers 2 - 8 cm thick that are enriched in calc-silicate
10- bearing minerals. Unlike in the Bigelow Brook and Hamilton
11 Reservoir Formations in the Southbridge, sulfide garnet and the
12 aluminum silicates generally are conspicuously absent.

13
14 Rock units mapped in the Southbridge Formation

15- SDsa Amphibolite -- Thinly layered, 1 - 15 cm, to thickly layered,
16 3 m, amphibolite containing interlayers of greenish-gray,
17 fine-grained, calc-silicate bearing gneiss and subordinate amounts
18 of biotite schist, quartzite, and sulfidic schist. Unit forms
19 the foot wall of the Black Pond Fault athwart the Willimantic
20- River Valley; it is also exposed in a more southerly fault slice
21 on Riley Mountain. Best exposures are on Riley Mountain, where
22 amphibolite is interlayered with thick resistant foliated pegmatite
23 lenses amounting to as much as 40 percent of the rock. Biotite
24 schist at the base of this unit characteristically contains
25- plagioclase augen as much as 2 cm long.

1 SDsc₅ Calc-silicate gneiss -- Fine- to medium-grained, well layered,
2 greenish-gray, quartz-plagioclase-diopside-calcite-green hornblende
3 gneiss interlayered with paper thin beds of biotite schist and
4 minor amphibolite. Calc-silicate bearing gneiss comprises about
5- 70 percent of the unit. This unit which is less than 70 m thick,
6 underlies the amphibolite, SDsa, but the contact is not exposed.
7 Calc-silicate gneiss is well exposed along Route 44 at the base of
8 Riley Mountain where the unit is in the hanging wall of an east
9 trending fault. Cataclastic textures and ultramylonite are common
10- in these outcrops.

11
12 SDss Aluminous Schist -- Medium-grained, reddish-orange to gray
13 weathering, quartz-plagioclase-biotite-garnet-sillimanite gneiss
14 interlayered with rusty-brown to yellowish-orange weathering
15- sulfidic graphitic schist. Sulfides are localized along schist
16 layers up to 30 cm thick. At the top of the unit is a well bedded,
17 light gray, garnetiferous gneiss. The garnets are as much as 2 cm
18 in diameter and weather to rusty clots that stain outcrop surfaces
19 reddish orange. The unit is approximately 50 m thick and is
20- well exposed in the fields due east of the State Hospital in
21 Mansfield Depot.

1 SDsc₄ Calc-silicate gneiss -- Lens of flaggy weathering, greenish-
2 gray, green amphibole gneiss interleaved with thin beds of biotite
3 schist. A characteristic muscovite rich, greenish-gray to silvery-
4 gray schist, 10 cm to 2 m thick, is present near the top of the
5- gneiss. Directly underlies the aluminous schist unit, SDss;
6 appears to be conformable but the contact is not exposed. The
7 gneiss is well exposed in the falls at the pumping station on
8 Cedar Brook; it is approximately 90 m thick.
9

10- SDsc₃ Calc-silicate gneiss -- Fine-grained, greenish gray,
11 conspicuously layered, 1 cm to 1m thick, gneiss. Approximately
12 75 m thick, and well exposed in Cedar Brook southeast of Hopkins
13 Road. Lies 200-300 m stratigraphically below SDsc₄.
14

15- SDsc₂ Calc-silicate gneiss -- 100 m thick, ^{consists of} lenses of green
16 hornblende-calcite gneiss interleaved with thinly layered
17 biotite schist. Well exposed on the ridge north of South
18 Eagleville Road lies south of a Lee Brook fault.
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1 SDsc₁ Calc-silicate gneiss -- Fine- to medium-grained, greenish-
2 gray, well bedded, 2 cm to 15 cm thick, quartz-plagioclase-diopside-
3 green hornblende-calcite gneiss interlayered with minor amounts of
4 biotite schist 1 - 3 cm thick which commonly exhibits relict
5- graded bedding. Unlike SDsc₂, the gneiss is extremely calcareous
6 and is deeply pitted on weathered surfaces. The biotite schist
7 comprises less than 10 percent of the unit. Approximately
8 70 m thick and well exposed in Olson Brook, west of the
9 Skungamaug River. Unit has been mapped for more than 6km
10- from south of Eagleville Lake almost to the western edge of the
11 quadrangle. It lies approximately 300 m stratigraphically beneath
12 SDsc₂.

Willimantic "Dome" Sequence

South of the Wangumbaug Lake Fault

Ohb Hebron Formation -- The Hebron Formation is a homogeneous sequence of medium- to dark-gray, fine-grained, paper thin to thinly layered, 1 - 5 cm, quartz-feldspar-black biotite schist intercalated with 5 - 10 cm thick, quartz feldspar rich layers that are internally laminated. Outcrop surfaces commonly are ribbed because schist layers weather more readily than the quartz rich layers. The schist weathers to a flaky, fine-grained, brown sand; quartz feldspar layers weather to flaggy blocks in which biotite laminae peel off readily. Biotite schist commonly exhibits relict cross lamination. Subordinate amounts of calc-silicate gneiss are present in beds 2 to 8 cm thick, but comprise less than 5 percent of the formation. Masses of quartz-plagioclase-biotite-muscovite pegmatite up to 8 m thick are abundant; they rarely crosscut the stratification except in detail. The formation crops out in the southwest corner of the South Coventry quadrangle. The base of the formation has been intruded by the Canterbury Gneiss; to the north it is cut off by Wangumbaug Lake fault. The Hebron is well exposed on north-trending ridges between Wheeling Road and Bear Swamp in the southwest corner of the quadrangle. These strata are contiguous with and lithologically similar to rocks of the type Hebron in the Columbia quadrangle to the south.

Putnam Group

The Putnam Group (Dixon, 1964) consists of the Tatnic Hill Formation underlain by the Quinebaug Formation, and the Tatnic Hill Formation in turn consists of 3 members; the Yantic Member is underlain by the Fly Pond Member which is underlain by the Lower Member. These formations crop out in the southeastern corner of the South Coventry quadrangle, south of the Wangumbaug Lake fault.

Tatnic Hill Formation

Oty Tatnic Hill Formation -- Yantic Member -- The Yantic Member is predominately light- to medium-gray, well foliated, quartz-oligoclase-biotite-muscovite-augen gneiss interlayered with medium- to dark-gray granular biotite schist and minor amounts of amphibolite. Oligoclase occurs in the groundmass, and porphyroblasts of oligoclase as much as 4 cm in diameter are common. The maximum thickness of the Yantic Member in the South Coventry quadrangle is 1200 m; it is cut out by a fault south of Eagleville, and reappears along this fault to the east in the Spring Hill quadrangle. The upper contact of the Yantic Member is not exposed in the South Coventry quadrangle, but according to Snyder (1967), this is a conformable contact in the Columbia quadrangle to the south. Representative outcrops of the Yantic Member are exposed on the knoll on the power line right-of-way between Route 31 and old Eagleville Road. The Yantic is distinguished from the Hebron by its generally

1 coarser grain size, more felsic composition with conspicuous
2 feldspar augen and the presence of muscovite.

3 According to Snyder the Fly Pond Member of the Tatnic
4 Hill Formation is a calc-silicate bearing gneiss that
5 separates the Yantic from the more heterogeneous Lower Member.
6 No calc-silicate gneiss unit was recognized in the South
7 Coventry quadrangle at this stratigraphic position.
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1 Otl Tatnic Hill Formation -- Lower Member -- Heterogeneous sequence
2 of gneiss and aluminous rich schist. The upper two thirds of
3 the section are chiefly medium-grained, well layered, light- to
4 dark-gray somewhat rusty brown weathering biotite-garnet-
5- sillimanite gneiss. The sillimanite gneiss is interlayered with
6 paper thin to 5 cm thick beds of granular, light- to dark-gray
7 calc-silicate bearing biotite schist, strongly foliated biotite-
8 muscovite-garnet augen gneiss that is more typical of the Yantic
9 Member; and well bedded quartz-plagioclase-diopside-scapolite
10- calc-silicate bearing gneiss. Layering in the calc-silicate
11 bearing gneiss varies from 2 cm to 15 cm but locally can be as
12 much as 2 m thick. Biotite schist, calc-silicate gneiss and
13 augen gneiss comprise less than 25 percent of upper part of the
14 section. Subordinate amounts of thinly layered to massive
15- amphibolite and well layered felsic gneiss are common throughout
16 the Lower Member. The lower part of the Lower Member is similar
17 to the upper part except that approximately 25 percent of this
18 part consists of rusty, reddish-orange-weathering aluminous
19 schist and gneiss. Layering varies from paper thin to 12 cm
20- thick. A thrust fault marks the base of the Tatnic Hill
21 Formation in the South Coventry quadrangle; the lower 600 m of
22 the formation exposed above the fault has a cataclastic to
23 protomylonitic texture that obscures primary layering; this
24 texture increases toward that fault. The Lower Member is
25- approximately 1500 m; it is well exposed east of the power lines
right-of-way on the knoll between Route 31 and Old Eagleville Road
in South Coventry.

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Rock units mapped in the Lower Member
of the Tatnic Hill Formation

Ols₂ Sulfidic schist -- Rusty- to reddish-orange weathering, strongly foliated aluminous sulfidic schist. Locally contains 5 to 45 cm thick beds of very light-gray, coarse-grained, calcite-diopside-graphitic marble. Unit is less than 10 m thick; well exposed on knoll northwest of South Coventry Station on Old Eagleville Road.

Ols₁ Sulfidic schist -- The base of the Tatnic Hill Formation is marked by a rusty- to reddish-orange weathering aluminous sulfidic schist that commonly contains knots of sillimanite pseudomorphic after kyanite. The rock has been so strongly cataclased as to completely obliterate original layering. Fine-grained, light-gray mylonite, 10 - 30 cm thick, with plagioclase and garnet porphyroclasts, stretched parallel to the foliation is present. This cataclastic unit varies from 0 - 12 m; is best exposed along the south facing hillcrest north of Coventry Road, in the southeast corner of the quadrangle.

Quinebaug Formation

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2 **Paq** Mostly light- to medium-gray quartz-plagioclase gneiss with
3 minor biotite and very little hornblende interlayered with dark-
4 gray to greenish-black hornblende amphibolite. The amphibolite
5- layers are thinly layered to massive and as much as 2 m thick;
6 commonly they are strongly boudined. The felsic gneiss comprises
7 about 75 percent of the member; it is massive to weakly foliated
8 in layers as much as 5 m thick. Schist, containing brown
9 amphibolite, is present locally. Unlike the Tatnic Hill Formation,
10- sulfidic schists are conspicuously absent from the Quinebaug
11 Formation. The Quinebaug Formation crops out in the southeastern
12 corner of the South Coventry quadrangle; representative exposures
13 crop out on the knoll north of Coventry Road, east of the
14 Willimantic River. The contact between the Quinebaug and the
15- Tatnic Hill Formation is not exposed in the South Coventry quad-
16- rangle, but to the south in the Columbia quadrangle, on I-84 the
17 contact is exposed. Deformation of the Quinebaug Formation
18 increases towards the top of the formation, where a 1 m thick
19 mylonite occurs which marks the contact between the two
20- formations. The overlying Lower Member of the Tatnic Hill
21 Formation exhibits the same style of deformation as the Bigelow
22 Brook Formation does between the Kinney Pond and Black Pond faults.
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Intrusive rocks

1
2 **TRd Diabase Dike -- Greenish gray to dark-gray, aphanitic**
3 **labradorite-augite-hypersthene-magnetite diabase.**

4
5- **Dfcd Diorite -- Weakly layered, medium- to coarse-grained, grayish-**
6 **brown to dark-gray weathering diorite. Weakly foliated except**
7 **near contacts where a strong biotite foliation occurs.**
8 **Composition may range from diorite to quartz-diorite with biotite**
9 **as the principal mafic and minor amounts of hornblende and**
10- **orthopyroxene altering to brown amphibole. The intrusives form**
11 **five northeast trending bodies and these intrusives have been**
12 **mapped; they vary in thickness from 90 to 160 m. Locally near**
13 **the contacts xenoliths of country rock are parallel to subparallel**
14 **to the foliation of the diorite. Regionally the diorite is**
15- **concordant to the foliation of the country rock but locally**
16 **crosscuts as much as 30 degrees. One of the 5 diorite bodies**
17 **lies south of Kinney Pond fault where it intrudes basal rocks of**
18 **the Bigelow Brook Formation just south of the town of Mansfield.**
19 **The other 4 diorite bodies lie north of the Kinney Pond fault**
20- **intruding various members of the Hamilton Reservoir Formation**
21 **from the Lower Schist Member in the northeast corner to the**
22 **Upper Schist Member in the northeast corner only about 600 m**
23 **southeast of the Bonemill Brook Fault. At least two of these**
24 **bodies are cut off by the Kinney Pond Fault along with the in-**
25- **truded strata of the Hamilton Reservoir Formation. Intrusion**
evidently took place before the latest principal thrusting.

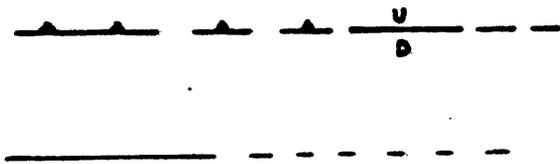
1 **Dc** **Canterbury Gneiss -- Light-gray, medium- to coarse-grained,**
2 **quartz-oligoclase-biotite-muscovite-garnet granodiorite gneiss.**
3 **Thin biotite rich folia common in the upper part of the gneiss**
4 **gives the weathered surface a ribbed appearance. The gneiss is**
5- **more massive in the center and contains less than 10 percent mica.**
6 **The base of the gneiss generally is conformable to bedding in the**
7 **country rock and has incorporated screens of the Hebron and Tatnic**
8 **Hill Formation as much as 35 m thick, well above the base of the**
9 **gneiss. Gneiss ranges from 800 to 1000 m thick; well exposed on**
10- **hill on northwest side of Route 275 in South Coventry and on east-**
11 **west trending ridges north of Dunhamtown Road in Eagleville.**

12 **The Canterbury Gneiss is similar to the Yantic Member of the**
13 **Tatnic Hill Formation and the contact is difficult to place**
14 **precisely. Both units are foliated and composed chiefly of**
15- **quartz and plagioclase with biotite and muscovite. The Canterbury**
16 **generally is much less conspicuously layered and compositionally**
17 **banded than the Yantic. Biotite is less common, finer grained**
18 **and more evenly distributed and muscovite is rare to absent in**
19 **the Canterbury.**

References

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- 21
22
23
24
25-

Symbols



Fault-dashed where approximately located; letters indicate dip-slip movement; arrows indicate strike-slip movement; sawteeth on upper plate

Contact-dashed where approximately located

Strike and dip of foliation

- 

Inclined
- 

Vertical
- 

Crenulated
- 

Warped foliation
- 

Horizontal
- 

Anticline - plunging axis
- 

Syncline - plunging axis
- 

Assymetric fold showing map sense of assymetry
- 

Bearing and plunge of lineation
- Strike and dip of joints**
- 

Inclined
- 

Vertical
- 

Location of float judged close to source
- 

Vein quartz
- 

Silicified zone
- 

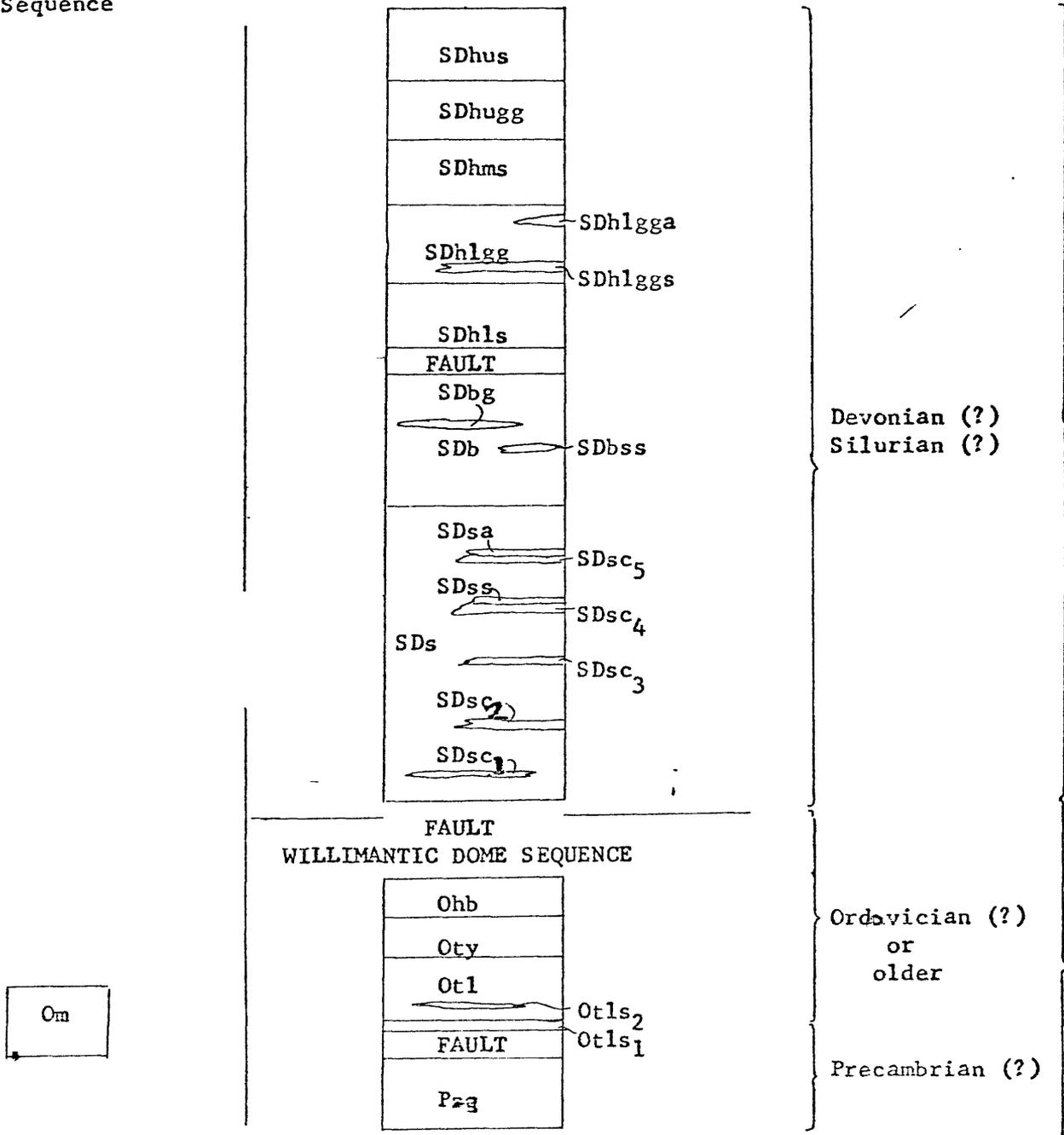
Closely spaced outcrops
- 

Outcrop

-Correlation of Map Units-

Bronson Hill Anticlinorium Sequence

Merrimac Synclinorium Sequence



Pre-Upper Devonian (?)

Pre-Silurian (?)

INTRUSIVE ROCKS

Tri } Triassic (?)

Dfed } Devonian (?) - Silurian (?)

Dc }