South Coventry Bedrock Geology w/ Explanations and Cross-Sections

Explanation

Map

Cross-Sections

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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.

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

Merrimac synclinorium rocks south of the Black Pond fault belong to the Southbridge Formation with the exception of a fault bounded block of the Bigelow Brook Formation near the western border of the quadrangle just south of the fault. Structural continuity within the Southbridge is sufficient to permit delineation of several mappable lithologic units. The Merrimac synclinorium sequence is separated from the Willimantic dome sequence by the westerly trending Lake/Wangumbaug fault.

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Bronson Hill Anticlinorium Sequence

West of the Bonemill Brook Fault

Om 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.

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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 -- Interlayered 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

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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.

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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 approximately 675 m in maximum thickness; 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.

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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 pseudomorphs 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.

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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.

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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).

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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.

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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

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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.

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Rock units mapped in the Bigelow Brook Formation

SDbg

SDblg 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.

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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, $SDsc_1$-$SDsc_5$. The lower calc-silicate units $SDsc_1$ and $SDsc_2$, 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.

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

Rock units mapped in the Southbridge Formation

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

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SDsc$_5$ Calc-silicate gneiss -- Fine- to medium-grained, well layered, greenish-gray, quartz-plagioclase-diopside-calcite-green hornblende gneiss interlayered with paper thin beds of biotite schist and minor amphibolite. Calc-silicate bearing gneiss comprises about 70 percent of the unit. This unit which is less than 70 m thick, underlies the amphibolite, SDsa, but the contact is not exposed. Calc-silicate gneiss is well exposed along Route 44 at the base of Riley Mountain where the unit is in the hanging wall of an east trending fault. Cataclastic textures and ultramylonite are common in these outcrops.

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

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$SDsc_4$ Calc-silicate gneiss -- Lens of flaggy weathering, greenish-gray, green amphibole gneiss interleaved with thin beds of biotite schist. A characteristic muscovite rich, greenish-gray to silvery-gray schist, 10 cm to 2 m thick, is present near the top of the gneiss. Directly underlies the aluminous schist unit, SDss; appears to be conformable but the contact is not exposed. The gneiss is well exposed in the falls at the pumping station on Cedar Brook; it is approximately 90 m thick.

$SDsc_3$ Calc-silicate gneiss -- Fine-grained, greenish gray, conspicuously layered, 1 cm to 1m thick, gneiss. Approximately 75 m thick, and well exposed in Cedar Brook southeast of Hopkins Road. Lies 200-300 m stratigraphically below $SDsc_4$.

$SDsc_2$ Calc-silicate gneiss -- 100 m thick, consists of lenses of green hornblende-calcite gneiss interleaved with thinly layered biotite schist. Well exposed on the ridge north of South Eagleville Road lies south of a Lee Brook fault.

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$SDsc_1$ Calc-silicate gneiss -- Fine- to medium-grained, greenish-gray, well bedded, 2 cm to 15 cm thick, quartz-plagioclase-diopside-green hornblende-calcite gneiss interlayered with minor amounts of biotite schist 1 - 3 cm thick which commonly exhibits relict graded bedding. Unlike $SDsc_2$, the gneiss is extremely calcareous and is deeply pitted on weathered surfaces. The biotite schist comprises less than 10 percent of the unit. Approximately 70 m thick and well exposed in Olson Brook, west of the Skungamaug River. Unit has been mapped for more than 6km from south of Eagleville Lake almost to the western edge of the quadrangle. It lies approximately 300 m stratigraphically beneath $SDsc_2$.

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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.

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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

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

According to Snyder the Fly Pond Member of the Tatnic Hill Formation is a calc-silicate bearing gneiss that separates the Yantic from the more heterogeneous Lower Member. No calc-silicate gneiss unit was recognized in the South Coventry quadrangle at this stratigraphic position.

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Otl Tatnic Hill Formation -- Lower Member -- Heterogeneous sequence of gneiss and aluminous rich schist. The upper two thirds of the section are chiefly medium-grained, well layered, light- to dark-gray somewhat rusty brown weathering biotite-garnet-sillimanite gneiss. The sillimanite gneiss is interlayered with paper thin to 5 cm thick beds of granular, light- to dark-gray calc-silicate bearing biotite schist, strongly foliated biotite-muscovite-garnet augen gneiss that is more typical of the Yantic Member; and well bedded quartz-plagioclase-diopside-scapolite calc-silicate bearing gneiss. Layering in the calc-silicate bearing gneiss varies from 2 cm to 15 cm but locally can be as much as 2 m thick. Biotite schist, calc-silicate gneiss and augen gneiss comprise less than 25 percent of upper part of the section. Subordinate amounts of thinly layered to massive amphibolite and well layered felsic gneiss are common throughout the Lower Member. The lower part of the Lower Member is similar to the upper part except that approximately 25 percent of this part consists of rusty, reddish-orange-weathering aluminous schist and gneiss. Layering varies from paper thin to 12 cm thick. A thrust fault marks the base of the Tatnic Hill Formation in the South Coventry quadrangle; the lower 600 m of the formation exposed above the fault has a cataclastic to protomylonitic texture that obscrues primary layering; this texture increases toward that fault. The Lower Member is 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

Ols$_2$ 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.

Ols$_1$ 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.

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Quinebaug Formation

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

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Intrusive rocks

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

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

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

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

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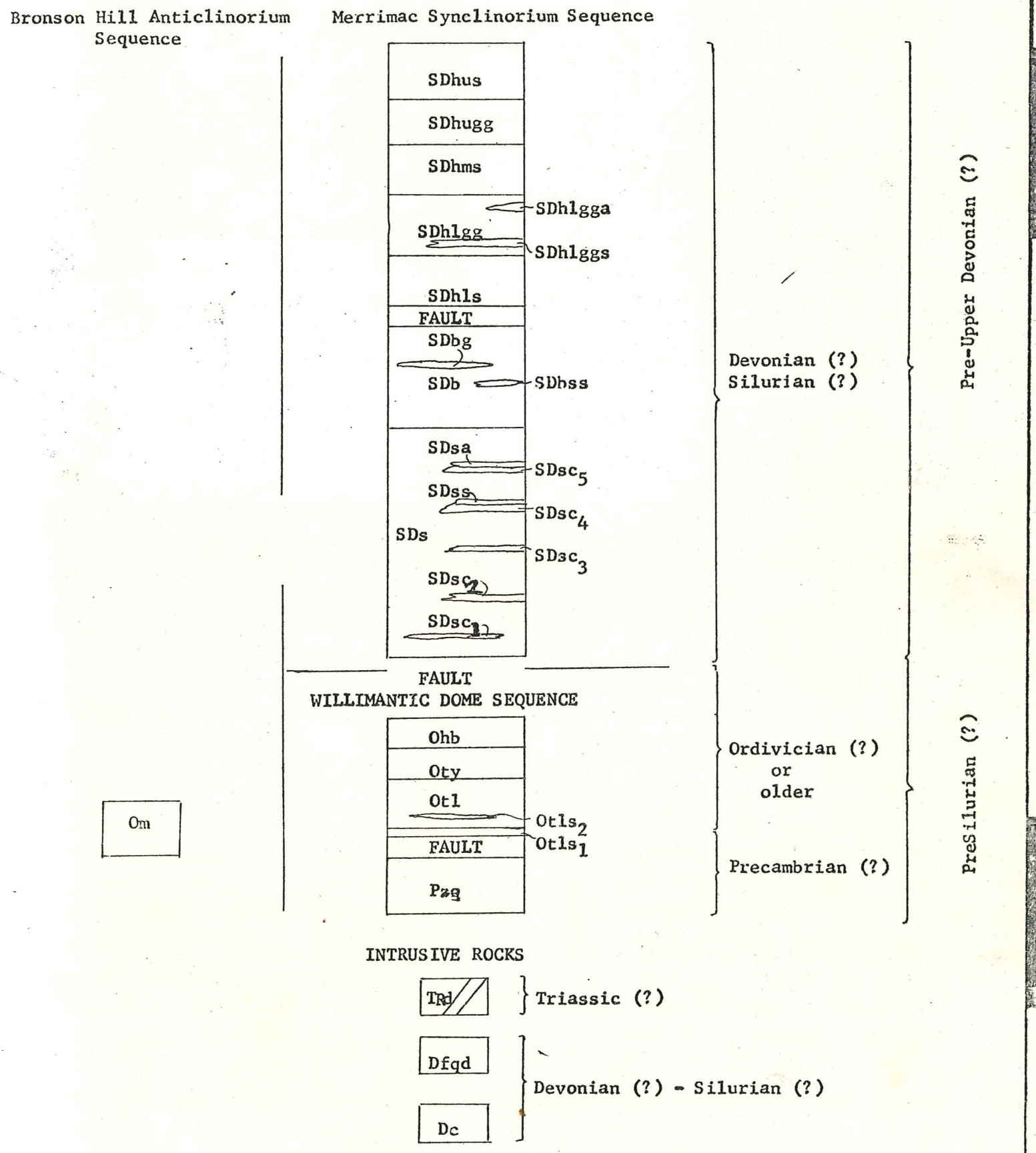
Bedrock Geologic Map of the South Coventry Quadrangle, Tolland County, Connecticut, By Richard J. Fahey and Maurice H. Pease, Jr.
1977

-Correlation of Map Units-



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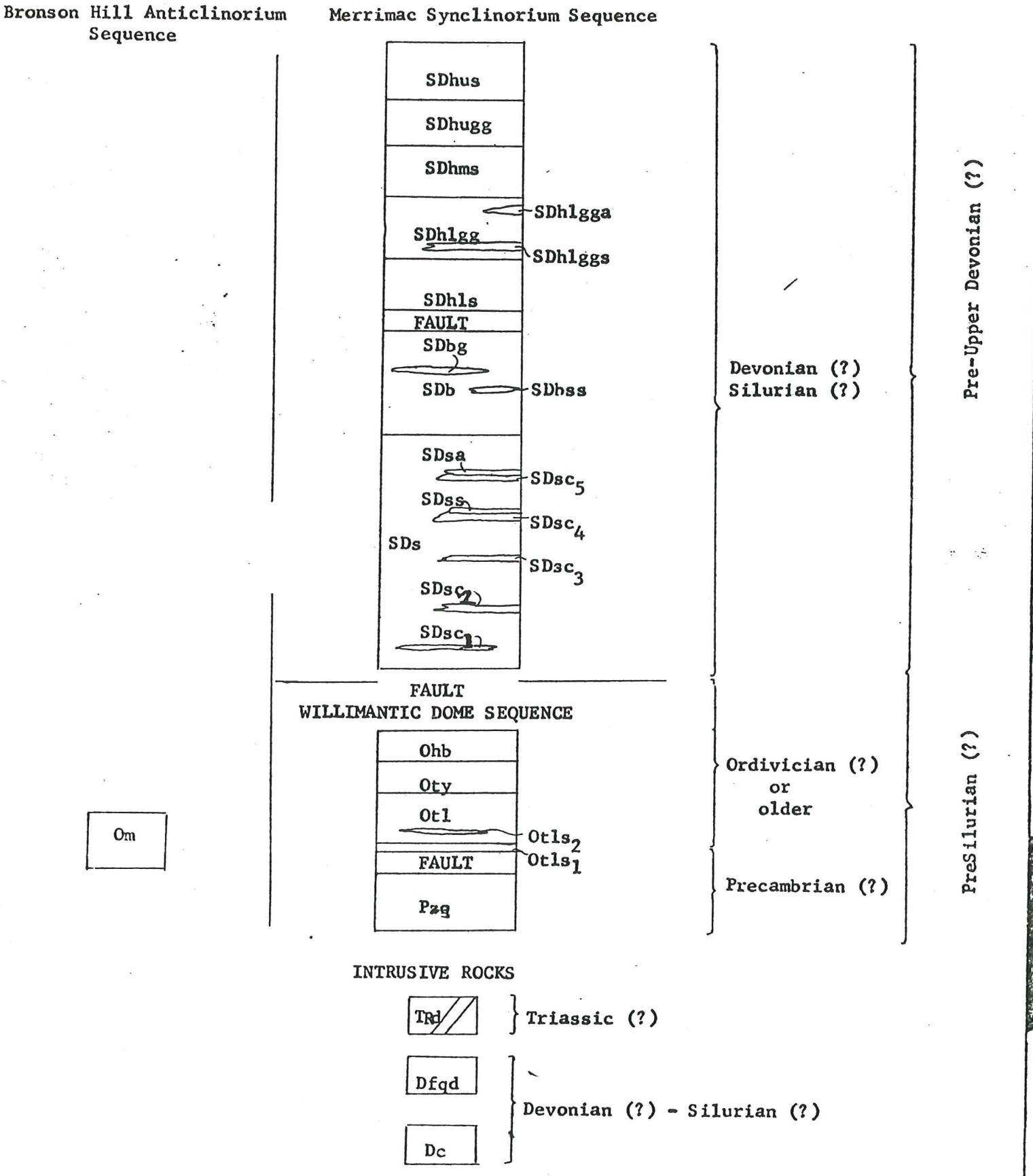

Symbols

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

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SOUTH COVENTRY QUADRANGLE
CONNECTICUT—TOLLAND CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)

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PRELIMINARY BEDROCK GEOLOGIC MAP OF THE SOUTH COVENTRY QUADRANGLE, TOLLAND COUNTY, CONNECTICUT

BY RICHARD J. FAHEY AND MAURICE H. PEASE, JR. 1977

base map by U. S. Geological Survey, 1970

Bedrock geology mapped in 1973 by M.H. Pease, Jr.;
in 1974-76 by R.J. Fahey
assisted by Thomas Bulcock summer 1974
Paul Banks summer 1974
Brad Dean summer 1974
Jonathan Husch summer 1975
David London summer 1975

SCALE 1:24000

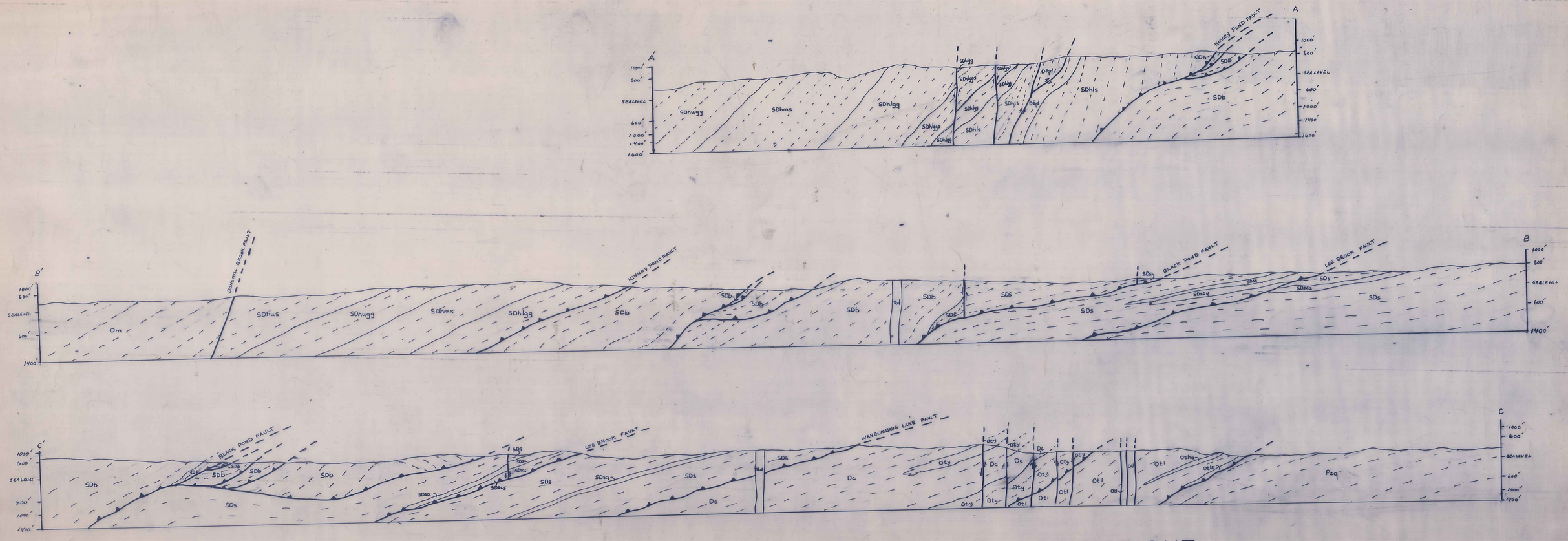
CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL

UTM GRID AND 1970 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET

CONNECTICUT
QUADRANGLE LOCATION

SOUTH COVENTRY, CONN.
N4145—W7215/7.5

1953
PHOTOREVISED 1970
AMS 6567 IV SE—SERIES V816



GEOLOGIC CROSS SECTIONS OF THE SOUTH COVENTRY QUADRANGLE, CONNECTICUT