Preliminary Geologic Map West Granville Quad Mass-Conn by Rud. Schnabel (sheet 1 of 2 sheets)

Explanation

A thin, discontinuous layer of windblown silt and sand, generally mixed with underlying glacial deposits, is present but not shown over most of the quadrangle.

Swamp deposits of Pleistocene to Holocene age are shown only by the standard map symbol for swamps on the topographic base map. Small, thin swamp deposits, now dry, were observed in low-lying areas but are not shown separately. The swamp deposits are composed of partly to non-decomposed organic matter mixed with varying proportions of sand, silt and gravel. Locally they contain minor amounts of peat.

Till deposits of Pleistocene age cover areas not covered by other Pleistocene or Holocene deposits where bedrock is not exposed. The till consists of brown to grayish brown non-sorted non-stratified clay, silt, sand, and gravel with proportions of grain sizes varying from place to place. Thickness of till is highly variable; a maximum thickness of 75 feet was observed in cuts along the two southernmost streams that flow eastward into Barkhamsted Reservoir. Hard, compact fissile till was observed only in cuts along the stream flowing southeastward from Prospect Hill.

Holocene

Qal

Alluvium

Stream deposits composed of gravel, sand, silt, clay, and organic debris. Generally light brown to dark yellowish brown. Extremely variable in thickness and lateral extent. Occurs along most valleys; shown only where thick or laterally extensive.

Qst

Stream terrace deposits

Gravel, sand, and silt, with minor amounts of clay deposited in terraces along Valley Brook. Generally light brown to grayish orange. Deposits commonly have concentrations of pebble to cobble gravel in upper one or two feet. Terraces commonly have elevations 30 to 40 feet above the level of the alluvial surface and probably represent alluvial deposits formed on ice-contact stratified drift deposits of the East Branch of the Farmington River and graded to an earlier, higher baselevel.

Qwb

Ice-contact stratified drift deposits along the valley of the East Branch of the Farmington River Well sorted stratified drift deposits displaying abundant collapse structures. Mostly sand and silt with gravel layers. Light grayish orange to pale orange. Deposited as kame terraces between ice and the valley wall. Deposits generally coarser than in New Hartford quadrangle to south.

Pleistocene

Qcd

Ice-contact stratified drift

Isolated, high level deposits of stratified sand, silt, and gravel with minor amounts of clay. Generally light yellowish orange to grayish orange. Many deposits preserve collapse structures.

Qic

Ice channel deposits

Isolated, high level deposits of gravel, sand and silt formed as glaciofluvial deposits in open channels in the ice, or in tunnels in or under the ice. Generally light yellowish orange to grayish orange. Commonly coarse-grained with relatively high proportion of pebble gravel.

QUATERNARY

UNCONFORMITY

Igneous and metamorphic rocks

In the following descriptions, minerals are listed in order of decreasing abundance; minerals in parenthesis are present in some, but not all, exposures.

Dp

Pegmatite

Medium- to very coarse-grained light-yellowish-gray, very light-gray and light pinkish-gray quartz-plagioclase-(microcline)-(muscovite)-(biotite)-(garnet)-(tourmaline)-(beryl) pegmatite and granitic rocks. Most bodies are white feldspar-quartz-mica rocks, pink feldspar is rare. Individual bodies range from a few inches to several hundred feet in maximum dimension in a given exposure. No attempt was made to correlate bodies across areas of non-exposure. Bodies are highly irregular both in plan and in cross section, and are both concordant and discordant. Nearly all outcrops show one or more pegmatite or granitic bodies; only some of the larger bodies are shown. Beryl was found in trace amounts only in two pegmatites, designated by letter b, one is on Route 57 west of Twining Hollow; the other is on Ripley Brook in the northwest part of the quadrangle.

Dd

Diorite

Coarse- to very coarse-grained medium-gray to very dark-gray hornblende-plagioclase (An_{35})-biotite-sphene-apatite-opaques-(quartz) diorite and diorite pegmatite. A boundary facies of the large body 20 to 200 feet wide consists of medium-gray to medium-reddish-gray, coarse-grained plagioclase-garnet-quartz-biotite rock that locally has garnets as much as 2 inches in diameter. One outcrop of black to very dark-greenish-gray, coarse-grained pyroxenite occurs on the small knolls in the swamp near the center of the large body. Age of the diorite is based on potassium-argon ages of 356 ± 11 million years on biotite and 373 ± 12 million years on hornblende from a pegmatite phase of the body (Zartman and others, 1970). Schists surrounding the body contain minor percentages of sulfide minerals and rust-staining; apparently these are the only contact-metamorphic effects.

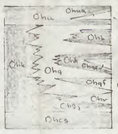
DEVONIAN

Upper Ordovician

Ou

Ultramafic rocks, undivided

Medium- to coarse-grained dark-greenish-gray to yellowish-gray serpentinite and talc rock. Exposed in several small bodies throughout the quadrangle. Locally, boulder concentrations in the till suggest the presence of other, buried bodies.



Hartland Formation

Ohu:--(Upper member) Heterogeneous unit of quartz-plagioclase-muscovite-biotite-garnet-(kyanite)-(sillimanite)-(staurolite) schist and granular schist, hornblende-plagioclase-(garnet)-(quartz) amphibolite and quartz-plagioclase-(clinozoisite)-(calcite)-(epidote)-(sphene) granulite, and one small outcrop of quartz-garnet granulite (coticule) north of Hurricane Brook road near base of unit (c). Most common rock type is medium-grained light-brown to light-gray thinly layered friable quartz-plagioclase-muscovite-garnet schist; other rock types occur as thin layers in schist

Ohus:--(Amphibolite zone) Medium-grained very dark-gray to black hornblende-plagioclase-(garnet)-(quartz) amphibolite, in layers within schist of Ohu. Mapped separately only where amphibolite layers occur in more than 50 percent of outcrops

Ohk:--(Kyanite-sillimanite schist) Coarse- to very coarse-grained medium- to dark-gray locally rust-stained quartz-plagioclase-biotite-muscovite-(kyanite)-(sillimanite)-garnet-(staurolite)-apatite-tourmaline-magnetite schist. Locally contains kyanite crystals and pseudomorphs of sillimanite after kyanite as much as 6 inches long. Very poorly bedded, with indistinct layering marked by local increases in abundance of individual minerals. About 4,000 feet thick in south end of quadrangle, interfingers with Ohg, Ohqf, and Ohr in northern part of quadrangle

Ohg:--(Garnet schist) Coarse-grained mediumggray quartz-plagioclase-biotite-muscovite-garnet-(sillimanite)-(kyanite)-tourmaline-(apatite)-magnetite schist. Characterized by brown euhedral garnets 1/4 to 1/2 inch in diameter and by lenticles of granular quartz about 1/2 inch thick and 1 foot long. Very poorly bedded, with indistinct layering marked by local increases in abundance of individual minerals. Interlayered with Ohk, Ohqf, and Ohr. Total thickness of layers about 4,000 feet

Ohqf:--(Quartzo-feldspathic schist) Fine- to medium-grained medium-grey, locally rust-stained quartz-plagioclase-biotite-muscovite-garnet-(tourmaline)-(sillimanite) schist. Characteristically a well-bedded rock with quartzo-feldspathic layers averaging about 2 inches in thickness, separated by mica-rich layers 1/8 to 1 inch in thickness. 0 to about 1,500 feet thick

Ohr:--(Rusty schist) Fine- to medium-grained, medium-greyish-brown, deeply rust-stained muscovite-biotite-quartz-plagioclase-garnet schist. Abundance of mica and rust-staining are characteristic. Extended into quadrangle from adjacent Southwick quadrangle on basis of one small outcrop. Ranges from 0 to about 300 feet in thickness

Ohcs:--(Calc-silicate zone) Dominantly medium-grained brownish-gray to medium gray quartz-plagioclase-muscovite-biotite schist. Zone characterized by fine-grained light-greenish-gray quartz-plagioclase-clinozoisite-epidote-microcline-calcite granular calc-silicate gneisses and by hornblende-biotite-garnet-(plagioclase) amphibolites as thin lenses and beds. Bedding is rarely preserved in the schists, locally the calc-silicate gneisses and amphibolites are thinly laminated. Layers of calc-silicate and amphibolite are parallel to schistosity in the schist. Unit is not well exposed and is projected into area partly on the basis of exposures in the adjacent New Hartford and Southwick quadrangles. 0 to about 1,000 feet thick

Middle and Late Ordovician

ORDOVICIAN

Straits Schist

Os:--Medium-grained medium-brownish-gray quartz-plagioclase-biotite-muscovite-garnet-(kyanite)-(sillimanite)-(staurolite)-(tourmaline)-graphite-apatite schist. Very well bedded in upper part, commonly shows well developed graded beds 1 inch to 4 inches thick. Less well bedded in lower part. Locally contains pods and lenses of zoisite amphibolite characteristic of underlying unit. Averages about 2,000 feet in thickness

Osz:--(Zoisite zone) Matrix is identical to lower part of above unit, but this zone is characterized by abundant pods or lenses of medium- to coarse-grained dark-gray quartz-plagioclase-hornblende-diopside-tremolite-garnet-zoisite-sphene amphibolite with zoisite porphyroblasts locally as much as 2 inches long. Averages about 1,500 feet thick

Collinsville Formation

Oc:--(Not exposed in West Granville quadrangle, presence interpreted from exposures in adjacent Southwick quadrangle.) Heterogeneous layered sequence of amphibolites, schists, gneisses, and coticules. Characterized in upper part by beds 1 to 4 feet thick of medium- to coarse-grained very dark-gray to black hornblende-plagioclase-quartz-(biotite)-(sphene)-(garnet)-(pyrite) gneisses that are commonly internally well layered. Includes 1 to 4 foot thick layers of muscovite-biotite-quartz-plagioclase-(garnet)-schists and 1/4 to 1/2 inch thick layers of quartz-garnet-(muscovite)-(biotite) granofels (coticule). About 200 feet of uppermost part present in southeastern part of quadrangle

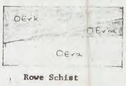
Occ--(Coticule zone) Medium-grained medium-brownish-gray quartz-plagioclase-muscovite-biotite-(kyanite)-(sillimanite)-(staurolite)-(tourmaline)-(apatite)-opaque minerals schist with interlayers 1/8 to 1/4 inch thick of fine- to very fine-grained light-pink to light-pinkish-gray quartz-garnet granofels (coticule). Zone is characterized by absence of graphite and presence of coticule layers. Beds are poorly developed in the schist; coticule layers are interpreted to be beds. About 500 feet thick

Moretown Formation

Omse:--Fine- to medium-grained medium-gray to medium-light-grayish-brown quartz-plagioclase-biotite-muscovite-garnet-(tourmaline)-(staurolite)-(kyanite)-(sillimanite)-apatite-opaque minerals schist and granular schist interlayered with fine- to medium-grained dark-greenish-gray to black massive to layered hornblende-plagioclase-quartz-magnetite-(garnet)-(sphene)-(epidote)-(apatite)-(biotite) gneiss in beds ranging from about 6 inches to 6 feet in thickness. A well bedded unit, about 4,000 feet of basal part present, top not exposed

Om:--Fine-grained light- to medium-gray quartz-plagioclase-biotite-muscovite-(apatite) granular schist. Very well bedded with quartzo-feldspathic granular layers 1/8 inch to 1/16 inch thick inter-layered with paper thin mica-rich schistose layers ("pinstripe" texture of Cady, 1956). About 2,000 feet of basal part present, top not exposed. In part overlies Omse, in part may be facies equivalent of Omse

Early to Late Cambrian and Early Ordovician



Rowe Schist

OCrk:--Medium- to coarse-grained light- to medium-gray quartz-plagioclase-muscovite-biotite-(kyanite)-(staurolite)-garnet-magnetite-tourmaline-apatite schist. Poorly bedded, locally layers of more abundant individual minerals interpreted to be beds. 0 to about 1,000 feet thick

OCrha:--Medium- to very coarse-grained dark-greenish-grey to dark-brownish-gray hornblende-anthophyllite-quartz-biotite amphibolite. Sprays of acicular anthophyllite as much as 4 inches long and blades of hornblende as much as 2 inches long in a medium-grained matrix of other minerals. Poorly bedded, poorly exposed. 0 to a maximum of 200 feet thick

OCra:--Fine-grained dark-greenish-gray to black and light-green hornblende-epidote-plagioclase-sphene banded amphibolite. Banding ranges from 1/32 to about 1/4 inch in thickness and commonly layers of nearly pure light-green epidote alternate with layers of nearly pure black hornblende. Forms an apparently discontinuous marker bed at base of formation in southern part of quadrangle, but layers and lenses extend well up into overlying Om unit. A well bedded rock. Includes rocks mapped as Chester amphibolite by Emerson (1917). Mapped only where thick or extensive, 0 to 1,000 feet thick

Preliminary Geologic Map West Granville Quad MASS-CONN by R.W. Schnabel (Sheet 3 of 4 sheets)

Hoosac Formation

Note: Total thickness of rocks mapped as Hoosac Formation is about 25,000 feet. Thickness of individual units is highly variable and not separately shown

Thin layers and lenses of hornblende-plagioclase-(quartz)-(garnet)-(epidote) amphibolite are scattered through the formation but mostly in the schists. They become more abundant toward base

Ehrs:--Fine- to medium-grained medium-grayish-brown quartz-plagioclase-biotite-muscovite-(garnet)-apatite-(tourmaline)-(kyanite)-opaque minerals schist. Characteristically rusty weathered but weathering rarely extends as much as one inch into outcrop. Also characteristically contains muscovite porphyroblasts about 1/16 to 1/8 inch in diameter that are oriented at random angles to the foliation which give the rock an odd "spangley" appearance

Ehs:--Medium-grained medium- to light-gray quartz-plagioclase-muscovite-biotite-(garnet)-(kyanite)-(sillimanite) schist. Rarely contains large amounts of accessory minerals, locally contains plagioclase porphyroblasts about 1/8 inch in diameter. Locally within the schist are rare, thin, discontinuous layers or lenses of medium- to fine-grained light- to medium-greenish-gray quartz-plagioclase-diopside-clinozoisite-epidote-microcline-opaque minerals-garnet-sphene calc-silicate gneiss

Ehg:--Fine- to medium-grained medium- to very light-gray quartz-plagioclase-biotite-(garnet)-(muscovite)-(microcline)-(kyanite)-(sillimanite)-(staurolite)-(tourmaline)-opaque minerals-(apatite) gneiss to granular schist. Locally plagioclase forms abundant porphyroblasts about 1/8 inch in diameter. Lithologically similar to Precambrian rocks exposed in Tolland Center quadrangle

Ehk:--Fine- to medium-grained medium- to medium-dark-gray quartz-muscovite-biotite-plagioclase-kyanite-(sillimanite)-(staurolite)-garnet-tourmaline-opaque minerals-apatite granular schist. Kyanite and sillimanite form aggregates of tiny crystals 1/4 to 1/2 inch in diameter that weather out as "knots" on the surface

Ehgs:--Fine- to medium-grained medium- to dark-grey quartz-plagioclase-biotite-muscovite-garnet schist. Characterized by relatively abundant brown garnets about 1/4 inch in diameter

Ehks:--Medium-grained medium-brownish-gray quartz-plagioclase-biotite-muscovite-garnet-kyanite-sillimanite schist. Similar to Ehk but aluminum silicates are more evenly distributed through rock

EARLY CAMBRIAN

CAMBRIAN

pCg

Gneiss and amphibolite

Medium- to fine-grained medium- to light-gray quartz-plagioclase-biotite-(muscovite)-(garnet) layered gneiss with 6 to 10 foot thick layers of very dark-gray to black hornblende-plagioclase-biotite-(garnet) gneiss near the top. Poorly exposed only in the northwestern corner of the quadrangle. Age designation is based on correlations with nearby areas and lithologic similarities

PRE-CAMBRIAN

Bedrock outcrops

Areas of closely spaced outcrops are shown by ruled pattern

Small, isolated outcrops shown only by position of structure symbol

Contact

Dashed where approximately located; dotted where concealed

Fault

Dashed where approximately located; dotted where concealed. U, upthrown side; D, downthrown side

Small fault

Exposed in outcrop, showing dip

PLANAR FEATURES

Coexisting features intersect at point of observation

Inclined Vertical Overturned

Strike and dip of parallel bedding and schistosity

Inclined Overturned

Approximate strike and dip of crumpled parallel bedding and schistosity

Inclined Vertical

Strike and dip of schistosity

Strike and dip of axial plane schistosity

Strike and dip of slip cleavage

Inclined Vertical

Strike and dip of joints

Strike and dip of flow banding in igneous rocks

LINEAR FEATURES

May be combined with planar features. When isolated, point of arrow is at observation, when combined with other features tail of arrow is at point of observation

Bearing and plunge of mineral lineation

Dextral Sinistral

Bearing and plunge of axes of minor folds

Plunging Horizontal

Bearing and plunge of crinkle folds

Bearing and plunge of intersection of planes

Bearing of glacial grooves or striations

Point of arrow is at observation when isolated, tail of arrow is at observation when plotted with bedrock observations

Graded beds Cross bedding Small channels or truncations

Relict sedimentary features used to determine top facing directions in metamorphic rocks. Numbers of symbol indicate subjective evaluation of quality of data; 3 symbols indicate good data, 2 symbols indicate fair data, 1 symbol indicates poor data

Active Abandoned

Gravel pits