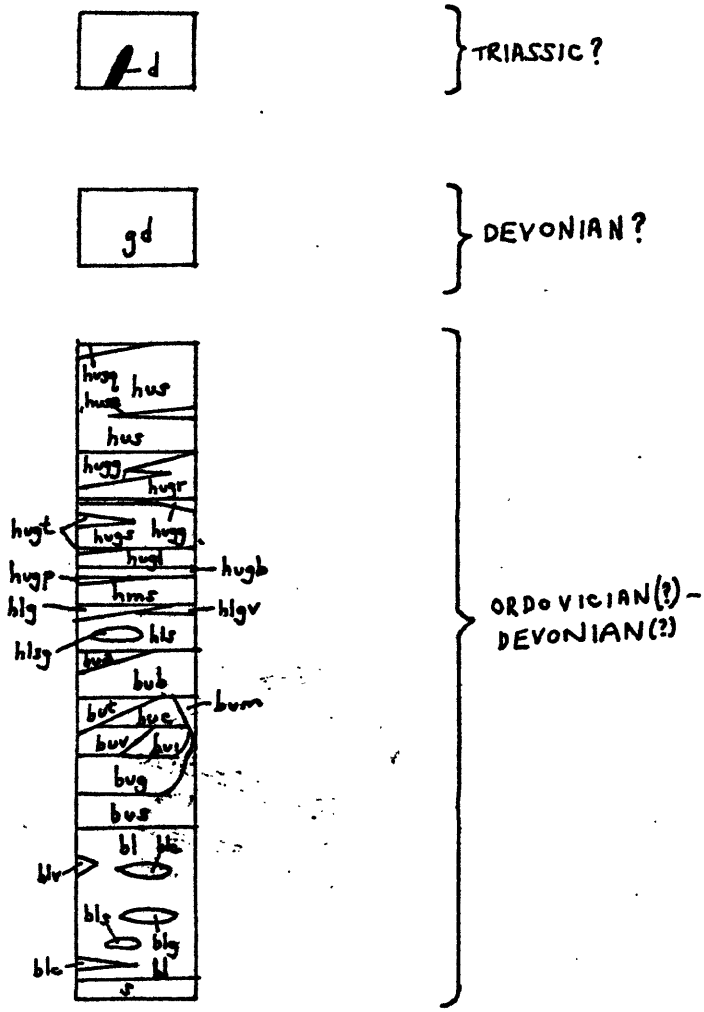
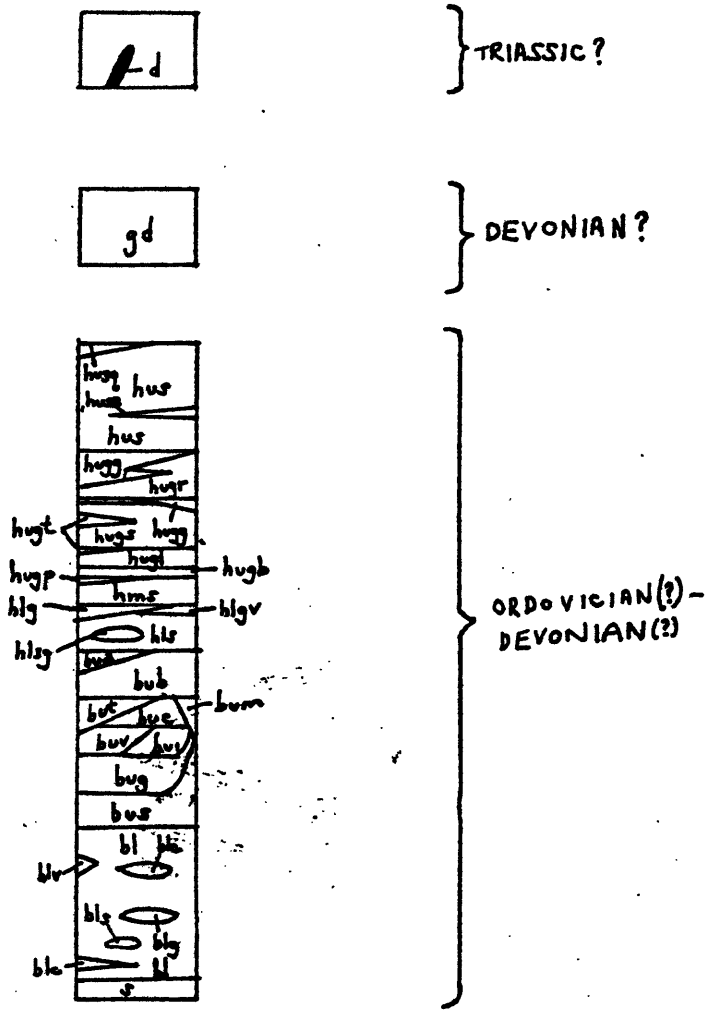
CORRELATION OF MAP UNITS



EAST BROOKFIELD, MAS

CORRELATION OF MAP UNITS



Massachusetts (East Brookfield quad.). Geol. 1:24,000. 1975
sheet 2
cop. 1

Fault, commonly inferred; queried where probable. Sawteeth on upper plate of thrust.

Strike and dip of bedding (parallel to foliation)

Ball indicates top determined from sedimentary structures

Inclined

Overturned

Strike and dip of foliation in metamorphic rock

Inclined

Crenulated

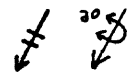
Strike and dip of foliation in intrusive rock

Inclined

Vertical

Bearing and plunge of mineral lineation (sillimanite)

May be combined with foliation symbol



Bearing and plunge of minor fold axis. Overturned anticline showing dip and plunge of axial plane

Strike and dip of joints in metamorphic rock

Inclined

Vertical

Strike and dip of joints in intrusive rock

Inclined

Vertical

Bedrock outcrops shown by solid color. Many small outcrops shown only by structure symbol. Areas of abundant outcrops indicated by black-screen overprint.

open file 75-530m

PRELIMINARY BEDROCK GEOLOGIC MAP OF THE EAST BROOKFIELD QUADRANGLE, WORCESTER COUNTY, MASSACHUSETTS

DESCRIPTION OF MAP UNITS

IGNEOUS ROCKS*

d DIABASE (TRIASSIC?) - Dark gray to black, fine-grained massive tholeiitic rock composed of plagioclase (labradorite) and augite with minor hornblende, magnetite, and some sericitization of plagioclase. Only mapped body is at least 0.8 km (0.5 mi) in length and about 27 m (90 ft) in width and crops out 1.6 km (1 mi) southeast of East Brookfield.

gd GRANODIORITE (DEVONIAN?) - Light- to medium-gray weathering, medium- to coarse-grained, very thickly layered to massive plagioclase-biotite-potassium feldspar-quartz-garnet granodiorite.

*Unmapped medium- to coarse-grained to pegmatitic light gray weathering felsic sills of varying thickness seldom exceeding 30 feet in width permeate the country rock. These bodies are usually leucogranites or leucogranodiorites. Tourmaline (schorlite) constitutes as much as 4 percent of some samples in the major outcrop belt in the extreme northwest corner of quadrangle.

hugr Gray to slightly rusty weathering, thinly layered, fine- to medium-grained plagioclase-quartz-biotite-garnet gneiss interlayered with sulfidic weathering fissile to very thinly layered quartz-biotite-potassium feldspar-sillimanite-garnet schist and gneiss.

hugs Reddish-brown to yellowish-orange weathering, fissile to thinly layered, mostly fine-grained quartz-biotite-potassium feldspar-plagioclase-sillimanite-garnet schist and gneiss. Unit includes unmapped minor gray to rusty weathering, very thinly layered, fine-grained quartz-feldspar-biotite gneiss and lenses of very fine-grained to fine-grained grayish-green weathering plagioclase-diopside-scapolite-hornblende-quartz gneiss (hugsc).

hugt Gray to slightly rusty-weathering, medium-grained, quartz-plagioclase-orthoclase-biotite-garnet gneiss. Not exposed in quadrangle.

hugl Gray weathering, thin to thickly layered, fine- to medium-grained plagioclase-quartz-biotite gneiss; potassium feldspar occurs sporadically and garnet is scant. Unit contains minor unmapped lenses of fine-grained hornblende-plagioclase gneiss or amphibolite. Unit probably represents interlayered felsic and subordinate mafic volcanic rocks.

hugb Gray weathering, commonly thinly layered, fine- to medium-grained plagioclase-quartz-biotite-hornblende-clinopyroxene gneiss and plagioclase-orthopyroxene-biotite-quartz gneiss with less common dark gray weathering medium-grained hornblende-pyroxene-biotite-plagioclase gneiss.

hugp Gray to slightly rusty weathering, thin to thickly layered, medium- to coarse-grained, less common fine-grained, plagioclase-quartz-potassium feldspar-biotite gneiss. Unit susceptible to slumping. Micropegmatitic. Probably an orthogneiss.

MIDDLE SCHIST MEMBER

hms Yellowish-orange to reddish-brown weathering, thinly laminated to thinly layered, fine- to medium-grained quartz-potassium feldspar-biotite-garnet-sillimanite-plagioclase schist with variable graphite and iron sulfide content. Also contains non-mappable minor dark gray to grayish-green weathering thinly layered fine-grained plagioclase-diopside-potassium feldspar-biotite-quartz-calcite gneiss, calcite-scapolite-quartz-diopside-plagioclase gneiss (impure marble) and gray to rusty weathering thinly layered fine-grained quartz-feldspar-biotite-garnet gneiss.

LOWER GNEISS MEMBER

hlg Gray to slightly rusty weathering, very thinly layered to thinly layered, mostly fine-grained, quartz-plagioclase-biotite gneiss with varying amounts of garnet, hornblende, and clinopyroxene. Also includes unmapped minor lenses of fissile sulfidic-weathering, graphitic and sillimanitic schist.

75-530

hlgv — Medium-grained dark gray feldspar-pyroxene gneiss (metavolcanics) locally containing quartz, hornblende, biotite, or garnet, and thin beds of calc-silicate rocks as observed in Southbridge quadrangle (Moore, written communication, 1974). Not exposed in quadrangle.

LOWER SCHIST MEMBER

hls — Yellowish-orange to reddish-brown weathering, thinly laminated to thinly layered fine-grained quartz-biotite-sillimanite-garnet-potassium feldspar-plagioclase schist with variable amounts of graphite and iron sulfide. Wide range in mineral abundances. Also includes gray to rusty weathering thinly layered fine-grained quartz-feldspar-biotite gneiss

hlsg — Gray weathering, mostly thickly layered fine-grained quartz-biotite-plagioclase-sericite-potassium feldspar gneiss; sheared cataclastic rock where seen in outcrop.

STRATIFIED METAMORPHIC ROCKS

BIGELOW BROOK FORMATION (ORDOVICIAN?-SILURIAN?)

UPPER GNEISS MEMBER

bua Gray to rusty weathering, thin- to thick-layered, fine- to medium-grained plagioclase-biotite-quartz-garnet-potassium feldspar-sillimanite-cordierite gneiss. Garnet porphyroblasts locally exceed 5 mm.

bub Dark gray weathering, thin to thick layered with latter more common, mostly medium-grained, less common coarse-grained and rarely fine-grained biotite-plagioclase-quartz gneiss. Latter three minerals make up 85 percent of rock. Sericitization of feldspar common. Only significant potassium feldspar content is in upper part of unit. Plagioclase is occasionally subporphyroblastic to porphyroblastic. Garnet is generally scarce except in ~~lowermost part~~ of sequence. Unit includes rusty weathering, thinly layered, fine- to coarse-grained quartz-potassium feldspar-plagioclase gneiss and schist, at least locally sheared, in northern part of area. Unit bub is similar to Unit bl except that this unit is more biotite-rich, coarser-grained, and generally more thickly layered.

but Gray to rusty weathering, very thin to thick layered, fine- to coarse-grained plagioclase-biotite-quartz-garnet-hornblende gneiss and plagioclase-biotite-quartz gneiss; also interlayered minor sulfidic weathering potassium

feldspar-quartz-garnet-plagioclase-sillimanite schist and gneiss.

buv Dark gray weathering, thin to thickly layered, medium- to coarse-grained biotite-plagioclase-quartz gneiss with minor diopside, sericite, chlorite, and plagioclase-biotite-quartz-hornblende gneiss.

bum Gray to rusty weathering, fine to coarse-grained, very thin to thinly layered quartz-feldspar-biotite-garnet-sillimanite-muscovite gneiss.

buc Medium to dark gray, thin to thickly layered, fine- to medium-grained, sheared biotite-plagioclase-quartz-potassium feldspar-sericite gneiss with scant garnet; porphyroblastic feldspar commonly 4-5 mm, unit is cataclastized.

bui Medium gray weathering, medium grained, thick to very thinly layered biotite-plagioclase-quartz-potassium feldspar orthogneiss. These four minerals make up 90 percent of rock. Garnet scarce. Plagioclase is sericitized in part. Micropegmatitic and microperthitic features in addition to textural and mineralogic homogenity lend credulence to belief that unit may be a melaquartz monzonite to granodiorite.

bug Gray to rusty weathering, fine- to medium-grained, very thinly to thinly layered quartz-biotite-potassium feldspar-garnet-sillimanite-plagioclase gneiss.

75-530

bus Interlayered gray to slightly rusty weathering fine- to medium-grained, thin to thickly layered quartz-plagioclase-biotite gneiss with occasional garnet, sillimanite, potassium feldspar, sericite, and cordierite and rusty weathering (reddish-brown to red to yellowish-orange), fine- to medium-grained, fissile to thinly layered garnetiferous and sillimanitic quartz-feldspar-biotite schist and gneiss with variable iron sulfide and graphite content.

LOWER GNEISS MEMBER

bl Dark to medium gray to slightly rusty weathering, mostly fine-grained, less common medium-grained and rarely coarse-grained, very thin to thickly layered quartz-biotite-plagioclase gneiss. Latter three minerals usually make up over 85 percent of rock. Includes non-mappable thinly layered calc-silicate gneiss, quartz-biotite-plagioclase gneiss with garnet porphyroblasts, and rare thin subunits of very rusty weathering sillimanitic-garnetiferous schist and gneiss. Muscovite (sericite) common between Cranberry Meadow Pond and South Spencer where it makes up 10 to 15 percent of rock. Opaque minerals seldom exceed 2 percent of samples. K-feldspar content is minor except for uppermost part of unit where rock is at least locally K-feldspar rich.

blc Medium gray to grayish-green weathering, very thin to thinly layered quartz-diopside-scapolite-hornblende-plagioclase calc-silicate gneiss.

blg Gray to slightly rusty weathering, thin- to thick-layered fine- to medium-grained biotite-plagioclase-quartz-potassium feldspar-garnet-sillimanite gneiss. Garnet porphyroblasts are sparse to moderate.

blv Not exposed in quadrangle. In Southbridge quadrangle unit is medium to dark gray weathering quartz-plagioclase-biotite gneiss that appears to be metavolcanics according to Moore (written communication, 1974).

bls Fissile to thinly layered, very rusty weathering sulfidic garnetiferous and sillimanitic schist and gneiss with occasional small graphite flakes.

75-530

SOUTHBRIDGE FORMATION

s — Not exposed in quadrangle. In Southbridge quadrangle (Moore, written commun., 1974) unit is a fine- to medium-grained light- to medium-gray weathering quartz-plagioclase-biotite gneiss that locally contains garnet and sillimanite.

Cross Section to Accompany

Preliminary Bedrock Geologic Map of the East Brookfield Quadrangle, Worcester County, Massachusetts

by J.S. Pomeroy