NEW HAMPSHIRE STATE PLANNING AND DEVELOPMENT COMMISSION AND HIGHWAY DEPARTMENT

NEW HAMPSHIRE
KEENE AND BRATTLEBORO QUADRANGLES

LEGEND

METAMORPHIC AND IGNEOUS ROCKS

LATE DEVONIAN? — New Hampshire Magma Series

co — **Concord granite**
(Light-gray fine-to medium-grained foliated granodiorite composed of oligoclase, quartz, and potash feldspar, with some muscovite and biotite.)

sgd — **Spaulding quartz diorite**
(Dark-gray medium-grained well-foliated granodiorite and quartz diorite composed of andesine, biotite, and quartz.)

kqml / kqm — **Kinsman quartz monzonite**
(Coarse-grained light-gray quartz monzonite to quartz diorite composed of quartz, oligoclase-andesine, potash feldspar, biotite, and muscovite; sillimanite present locally; in most places rock contains phenocrysts of microcline one to two inches long, locally phenocrysts are albite, oligoclase or andesine; border of body well foliated (kqml); inclusions of mica schist and sillimanite schist abundant locally (kqml).)

gd — **Granodiorite and quartz diorite**
(Medium-grained light-to dark-gray granodiorite and quartz diorite composed of oligoclase-andesine, quartz, biotite, muscovite and potash feldspar. Locally foliated, some bodies strongly sheared.)

Amphibolite
(Areas where amphibolite sills and dikes are abundant. Dark-gray to black foliated amphibolite containing phenocrysts of andesine or labradorite; groundmass composed of hornblende and andesine or labradorite.)

MIDDLE DEVONIAN? — Oliverian Magma Series

olgd / olgd / olqm — **Quartz diorite, granodiorite, and quartz monzonite gneiss**
(Medium-grained gray to pink subporphyritic strongly to weakly-foliated gneiss composed of oligoclase-andesine, quartz, potash feldspar, and biotite. Depending on character and amount of feldspar, rock is quartz diorite (olqd), granodiorite (olgd), or quartz monzonite (olqm.)

LOWER DEVONIAN — Lower Devonian

Dll / Dlv / Dlq / Dl — **Littleton formation**
(Zone m: mica schist, quartz-mica schist, and thin fine-grained gray quartzite, locally with porphyroblasts of biotite, garnet, and/or staurolite (Dl). Local beds of white vitreous quartzite and quartz conglomerate (Dlq). Interbedded amphibolite and light-colored quartz-feldspar-biotite volcanics (Dlv). Interbedded lime-silicate granulite and schist, biotite schist, and fine-grained feldspathic quartzite, with some associated white vitreous quartzite, amphibolite, and light-colored quartz-feldspar-biotite volcanics(Dll). Zone k: mica schist, quartz-mica schist, and thin fine-grained gray quartzite, with porphyroblasts of garnet and sillimanite (Dl). White vitreous quartzite and quartz conglomerate (Dlq.)

SILURIAN — Lower or Middle

Sc — **Clough quartzite**
(Zone m: coarse white vitreous quartzite and quartz conglomerate, with some thin beds of muscovite-quartz schist; porphyroblasts of garnet and/or staurolite present locally. Zone k: quartzite, quartz conglomerate, and some thin beds of muscovite-quartz schist. Porphyroblasts of garnet and traces of sillimanite present locally.)

PRE-SILURIAN, PROBABLY ORDOVICIAN — Upper Ordovician? / Middle Ordovician?

Op — **Partridge formation**
(Zone m: mica schist, garnet-mica schist, staurolite-mica schist, quartz-mica schist, and micaceous quartzite. Local lime silicate schist and granulite; also amphibolite and quartz-feldspar-biotite gneiss. Zone k: mica schist, garnet-mica schist, sillimanite-garnet schist, and micaceous quartzite.)

Oam — **Ammonoosuc volcanics**
(Zone m: chiefly fine-grained gray quartz-feldspar-biotite gneiss and dark amphibolite; occasional beds of white pyritiferous quartzite; local light-colored volcanic conglomerate; accessory garnet. Zone k: fine-grained quartz-feldspar-biotite gneiss, amphibolite, and some quartzite. Some of the quartzite and light-colored gneiss contains sillimanite.)
Lower part of Ammonoosuc volcanics, all of the Albee formation, and upper part of the Orfordville formation, which are present elsewhere, are missing in this quadrangle due to the Northey Hill thrust.

Oo / Oos / Oov / Oo — **Orfordville formation**
(Zone l: dark phyllite and slate, abundant thin gray quartzite and quarts-mica schist (Oo); fine grained buff to gray felsitic volcanics (Oov), quartzite, conglomerate with pebbles of quartz and slate, slate, and thin beds of impure marble (Oos); dark slate with an occasional thin quartzite (Oos). Zone m: mica schist, quarts-mica schist, and quartzite, with porphyroblasts of biotite, garnet, and/or staurolite.)

Owv / Ow — **Waits River formation**
(Zone l: fine-grained dark-gray impure marble, dark slate, and phyllite, with interbedded thin quartzite and quarts-mica schist (Ow); light-gray fine-grained felsitic volcanics (Owv). Zone m: fine-grained dark-gray impure marble, mica schist, quarts-mica schist, and thin beds of impure marble (Owv); dark slate with an occasional thin quartzite (Ow); amphibolite with some quartz-feldspar-biotite gneiss (Owv).)

METAMORPHIC ZONES

Shown below formation symbol thus: Dl / m

l - low-grade
m - middle-grade
h - high-grade

CONTACTS

Accurate

Approximate and diagrammatic due to poor exposure.

Indefinite as sharp contact is lacking.

Used to connect isolated outcrops of discontinuous stratigraphic units to indicate the inferred location of the horizon where the unit is absent.

SPECIAL SYMBOLS

(Strike and dip symbols represent only a small percentage of the field observations)

Strike and dip of bedding, including inverted and normal beds.

Strike and dip of inverted beds.

Strike of vertical beds.

Horizontal bedding.

Strike and dip of foliation and schistosity

Strike of vertical foliation and schistosity

Horizontal foliation and schistosity.

Normal fault; U on upthrown side (where space permits use of symbols).

Thrust fault; T upthrown side.

Silicified fault zone.

Pegmatite

Mines and quarries, mostly abandoned.

SECTION B-B′

SECTION D-D′

SECTION E-E′

SECTION A-A′

SECTION C-C′

GEOLOGIC MAP AND STRUCTURE SECTIONS OF THE KEENE AND BRATTLEBORO QUADRANGLES, NEW HAMPSHIRE

Topographic base by U. S. Geological Survey, surveyed in cooperation with the State of New Hampshire

Scale 1/62500
1 0 1 2 3 4 Miles
5000 0 5000 10000 15000 20000 Feet
1 0 1 2 3 4 5 Kilometers
Contour interval 20 feet
Datum is mean sea level

APPROXIMATE MEAN DECLINATION 1932

Geology by George E. Moore, assisted by M. T. Heald, J. A. Haertlein, G. Corwin, R. F. Meyer, and J. B. Thompson. Directed by Marland P. Billings. Geology surveyed in 1940, 1941, 1942, and 1946, with the aid of grants from the Whitney, Sayles, and Holden funds of Harvard University. Published 1949.

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