NEW HAMPSHIRE STATE PLANNING AND DEVELOPMENT COMMISSION AND HIGHWAY DEPARTMENT

NEW HAMPSHIRE-VERMONT BELLOWS FALLS QUADRANGLE

(Ludlow) (Claremont) (Stanstead) (Bradleboro) (Keene) (Monadnock)

72°30' 25' 20' 72°15' 43°15' 43°00'

LEGEND

METAMORPHIC AND IGNEOUS ROCKS

MISSISSIPPIAN ? — *White Mountain Magma Series*

c — **Camptonite**
(Medium- to fine-grained, dark-gray camptonite composed of andesine-labradorite and brown hornblende. Locally it is porphyritic or amygdaloidal.)

LATE DEVONIAN ? — *New Hampshire Magma Series*

Pegmatite
(Strike and dip, or strike, given where known; plus sign indicates location only. No attempt has been made to give size, shape, and quality; some pegmatites are probably related to the Oliverian magma series.)

g — **Granite**
(Medium-grained, light-gray granite composed of albite-oligoclase, potash feldspar, muscovite, and biotite.)

bg — **Bethlehem gneiss**
(Medium- to coarse-grained, gray granite to granodiorite gneiss, composed of oligoclase-andesine, potash feldspar, biotite, and muscovite.)

MIDDLE DEVONIAN ? — *Oliverian Magma Series*

ol — **Granite and quartz monzonite gneiss**
(Fine- to medium-grained, pink granite to quartz monzonite gneiss, composed of oligoclase-andesine, potash feldspar, and biotite.)

LOWER DEVONIAN — *Lower Devonian*

Littleton formation
(Zone m: mica schist, mica-quartz schist, and quartz-mica schist, each with porphyroblasts of biotite, garnet, and staurolite; interbedded quartzite and quartz conglomerate (Dlq) ; interbedded lime-silicate granulite and schist (Dll) ; interbedded amphibolite and felsitic volcanics (Dlv) . Zone h: sillimanite schist, mica schist, mica-quartz schist, quartz-mica schist, and quartzite; interbedded quartzite and quartz conglomerate (Dlq) ; areas where concordant injections of Bethlehem gneiss are abundant. (Dll).

SILURIAN — *Lower or Middle*

Sc — **Clough formation**
(Zones m and h: Quartz conglomerate, quartzite, and quartz-mica schist.)

UNCONFORMITY

PRE-SILURIAN, PROBABLY ORDOVICIAN — *Upper Ordovician ?*

Op — **Partridge formation**
(Zone m: mica schist, mica-quartz schist, quartz-mica schist, and thin quartzite, each with porphyroblasts of biotite and garnet. Zone h: mica schist, mica-quartz schist, quartz-mica schist, quartzite, and sillimanite schist.)

Oam — **Ammonoosuc volcanics**
(Zones m and h: amphibolite and some biotite gneiss.)

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.

Middle Ordovician ?

Ooh / Oo / Oov — **Orfordville formation**
(Zone l: slate and graphitic sericite schist (Oo) ; and interbedded volcanic rocks composed of chlorite schist (Oov) Zone m: graphitic mica schist, mica schist, and paper-thin quartzite, each with porphyroblasts of biotite, garnet, and staurolite; interbedded Hardy Hill member, quartzite and quartz conglomerate (Ooh) ; interbedded volcanic rocks, amphibolite and some biotite gneiss (Oov).

Ow — **Waits River formation**
(Zone m: mica-quartz schist, calcareous mica-quartz schist, each with porphyroblasts of biotite and garnet; also impure marble.)

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 exposures.

Indefinite as sharp contact is lacking

The quartzite and quartz conglomerate Ooh, Sc, and Dlq are discontinuous; the isolated outcrops are connected by the dash-dot line to indicate the inferred location of the horizon where the stratigraphic unit is absent.

SPECIAL SYMBOLS

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

25° — Strike and dip of bedding, including inverted and normal beds.

Strike of vertical beds.

60° — Strike and dip of overturned beds.

Horizontal bedding.

40° — Strike and dip of foliation and schistosity.

Strike of vertical foliation and schistosity.

Horizontal schistosity.

U / D — Normal fault; U on upthrown side.

T — Thrust fault; T on upthrown side.

S — Silicified fault zone.

Mines, prospects, and quarries, mostly abandoned.

SECTION A-A

SECTION B-B′

SECTION C-C′

SECTION D-D′

GEOLOGIC MAP AND STRUCTURE SECTIONS OF THE BELLOWS FALLS QUADRANGLE, 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, 1927

Geology by F. C. Kruger, assisted by J. H. Todd, G. C. Kennedy, J. H. Eric, G. E. Moore, and W. R. Thurston. Directed by Marland P. Billings. Geology surveyed 1937-1940, with the aid of grants from the Sayles Fund and Shaler Fund of Harvard University. Published 1945. Oriented pegmatite data from G. W. Stewart, U. S. Geological Survey.