PRELIMINARY GEOLOGIC MAP AND SECTIONS OF THE KUNKLETOWN 7 1/2 MINUTE QUADRANGLE, PENNSYLVANIA

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SHEET 3 OF 3- EXPLANATION

EXPLANATION

Holocene

Qal

Alluvium

Cobbles to clay in drainage channels. Probably not more than 20 feet thick in most places.

Qsr

Shale-chip rubble

Lower slope accumulations of chips of Mahantango shale along Chapple Creek. More than 20 feet thick.

Qwo

Wisconsinan Outwash

Sand and gravel with rounded to subrounded cobbles and boulders with a paper-thin weathering rind. Probably not more than 50 feet thick in most places.

Pleistocene

Wisconsinan

Qio

Illinoian Outwash

Reddish-brown sandy gravel with rounded pebbles and cobbles; poorly exposed. May be more 80 feet thick.

Illinoian

Qit

Illinoian Till

Poorly sorted reddish-brown till; probably more than 100 feet thick in places. Includes colluvium along south slope of Blue Mountain

QUATERNARY

Unconformity

Upper Devonian

Catskill Formation

Dclr

Long Run Member

Gray and red sandstone and red siltstone and shale in fining-upward cycles. About 2350 feet thick; only lower 650 feet exposed in quadrangle.

Dcbr

Beaverdam Run Member

Gray siltstone to fine-grained sandstone and some olive shale with rare *Tentaculites* and crinoid columnals. Thickness about 600 feet.

Dcw

Walcksville Member

Red, green, and gray, very fine to medium-grained sandstone and red siltstone and shale; some fining-upward cycles. About 1700 feet thick.

Dct

Towamensing Member

Gray, fine-grained sandstone, siltstone, and shale, slightly more massive than the underlying Trimmers Rock Formation. About 275 feet thick.

Dtr

Trimmers Rock Formation

Gray, blocky siltstone and shale with scattered fossils. Thickness ranges from 700 to 1050 feet.

Upper Devonian

Hamilton Group

Dmh

Mahantango Formation

Dark-gray, generally cleaved shale and siltstone. About 2575 feet thick. Includes three fossiliferous zones: Little Gap (LG, 44 feet thick), Kunkletown (K, 20 feet thick), and Centerfield (C, 20-30 feet thick); and a blocky siltstone (Nis Hollow, N, about 20 feet thick).

Dm | Dmbs / Dmu

Marcellus Formation

Dm, Marcellus Formation, undivided; dark-gray silty shale. About 800 feet thick with considerable structural thickening and thinning. About 6 feet of basal black carbonaceous shale (Dmu, Union Springs Shale Member) exposed at top of Chestnut Ridge. Stony Hollow and Brodhead Creek Members (Dmbs) not differentiated in quadrangle.

Middle Devonian

DEVONIAN

Upper Ordovician

Db

Buttermilk Falls Limestone

Deeply leached, light-colored cherty argillaceous limestone. About 65 feet thick.

Unconformity?

Dp

Palmerton Sandstone

Massive light-colored, weathered, partly conglomeratic coarse-grained sandstone. About 100 feet thick.

Dse

Schoharie and Esopus Formations, Undifferentiated

Weathered partly cherty siltstone with abundant burrows (*Taonurus*). About 100 feet thick.

Unconformity?

Dr

Ridgely Sandstone of the Oriskany Group

Weathered light-colored quartz-pebble conglomerate and conglomeratic sandstone with brachiopod molds. About 45 feet thick.

Dsn

Shriver Chert of the Oriskany Group and New Scotland Formation, undivided

Weathered fossiliferous chert, sandstone, and conglomerate (Shriver) and fossiliferous chert and silty shale (New Scotland). About 90 feet thick.

DSsd

Stormville Member of the Coeymans Formation and Decker Formation, undivided

Weathered poorly fossiliferous sandstone and lesser conglomerate (Stormville) and limonitic siltstone, sandstone, and shale (Decker). About 100 feet thick.

Upper Silurian

Sbv

Bossardville Limestone

Laminated to thin-bedded limestone. About 100 feet thick.

Spi

Poxono Island Formation

Poorly exposed dolomite, limestone, and shale. Thickness variable, averages about 600 feet thick.

Middle Silurian

Sb

Bloomsburg Red Beds

Red siltstone, shale, and sandstone. About 1,500 feet thick.

Lower Silurian

Sst / Ssl / SOsm / SOsw

Shawangunk Formation

Sst, Tammany Member; gray, fine-grained to conglomeratic quartzite. 0-about 400 feet thick. Grades laterally into Lizard Creek Member.

Ssl, Lizard Creek Member. Gray and minor reddish sandstone, siltstone, and shale. 800-1,400 feet thick.

SOsm, Minsi Member. Gray, partly conglomeratic quartzite. About 350 feet thick.

SOsw, Weiders Member; Conglomerate and quartzite, pebbles as much as two inches long. 0-125 feet thick.

Unconformity

Upper Ordovician

Martinsburg Formation

Middle Ordovician

Omp

Pen Argyl Member

Gray, thick- to thin-bedded slate with minor graywacke. 5,000-6,000 feet thick.

Omr

Ramseyburg Member

Gray, thick- to thin-bedded graywacke and slate. About 3,000 feet thick.

Omb

Bushkill Member

Thin-bedded slate and minor graywacke. Probably close to 5,000 feet thick.

DEVONIAN-SILURIAN

SILURIAN

SILURIAN-ORDOVICIAN

ORDOVICIAN

STRUCTURAL SYMBOLS

Contact

Dashed where approximately located; short dashed where inferred; dotted where concealed. Zigzag contact is arbitrary cutoff between the Tammany and Lizard Creek Members of the Shawangunk Formation.

Décollement

Inclined Overturned

Sawteeth on upper plate. Dashed where approximately located; dotted where concealed.

Thrust fault

Sawteeth on upper plate. Dashed where approximately located; short dashed where inferred; dotted where concealed.

High-angle fault

U / D

Dotted where concealed. U, upthrown side; D, downthrown side.

Anticline

Showing trace of axial surface and direction of plunge. Dashed where approximately located; short dashed where inferred; dotted where concealed.

Syncline

Showing trace of axial surface and direction of plunge. Dashed where approximately located; short dashed where inferred; dotted where concealed.

Anticline

Showing trace of crestal plane and direction of plunge. Dashed where approximately located; short dashed where inferred; dotted where concealed.

Syncline

Showing trace of trough plane and direction of plunge. Dashed where approximately located; short dashed where inferred; dotted where concealed.

Overturned anticline

Showing trace of axial surface and direction of dip of limbs and plunge. Dashed where approximately located; short dashed where inferred; dotted where concealed.

Overturned syncline

Showing trace of axial surface and direction of dip of limbs and plunge. Dashed where approximately located; short dashed where inferred; dotted where concealed.

35 Inclined Vertical Horizontal

55 Overturned

Strike and dip of beds

Strike and dip of slaty cleavage

30 / 43

Strike and dip of bedding and cleavage parallel in strike but divergent in dip

Inclined Horizontal

Bearing and plunge of intersection of bedding and cleavage

45

Strike and dip of slip cleavage

Bearing and plunge of intersection of slaty cleavage and slip cleavage

17

Bearing and plunge of slickensides on slaty cleavage

Abandoned limestone quarry

Abandoned sand pit

A — A'

Line of cross section

Detailed descriptions of the stratigraphy and structure may be obtained from:

Epstein, J. B., and Epstein, A. G., 1969, Geology of the Valley and Ridge province between Delaware Water Gap and Lehigh Gap, Pennsylvania, *in* Subitzky, Seymour, ed., Geology of selected areas in New Jersey and eastern Pennsylvania and guidebook of excursions: New Brunswick, N. J., Rutgers Univ. Press, p. 132-205.

Epstein, J. B., Sevon, W. D., and Glaesser, J. D., 1974, Geology and mineral resources of the Lehighton and Palmerton 7 1/2-minute quadrangles, Pennsylvania: Pennsylvania Geol. Survey 4th ser., Atlas 195 cd, 460 p.

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