GEOLOGIC MAP OF THE WIND GAP QUADRANGLE, PENNSYLVANIA BY JACK B. EPSTEIN 198_ EXPLANATION STRUCTURAL SYMBOLS Dashed where approximately located; short dashed where inferred; dotted where concealed makes amount the see on the suffers amount offer in a 1991. Inclined Décollement Dashed where approximately located; short dashed where inferred. Sawteeth on upper plate Thrust fault Dashed where approximately located; short dashed where inferred; dotted where concealed. T. on upper plate. Identified by disrupted bedding and by quartz- and lesser calcitefilled shear zones that are a few inches to several tens of feet thick. Parallels and cuts both bedding and cleavage. May be pre-or post-cleavage in age. Mapped mostly by tracing quartz float across fields. Some faults may not be as continuous as shown on the map, and many more faults than shown are Showing trace of axial surface. Dashed where approximately located; short dashed where inferred; dotted where concealed Syncline Showing trace of axial surface. Dashed where approximately located; short dashed where inferred; dotted where concealed Overturned anticline Showing trace of axial surface. Dashed where approximately located; short dashed where inferred; dotted where concealed Overturned syncline Showing trace of axial surface. Dashed where approximately located; short dashed where inferred; dotted where concealed Inclined *Vertical ⊕ Horizontal Overturned Rotated more than 1800 Strike and dip of beds 134 Strike and dip of slaty cleavage Strike and dip of bedding and cleavage parallel in strike but divergent in dip 44-Inclined Horizontal Bearing and plunge of intersection of bedding and cleavage 48 Inclined Vertical Strike and dip of slip cleavage Bearing and plunge of intersection of cleavage and slip cleavage GEOLOGIC MAP OF THE WIND GAP QUADRANGLE, Minor fold in cleavage Showing bearing and plunge of axis A Bedding-plane slickensides Showing bearing and plunge Slickensides on cleavage Showing bearing and plunge State or limestone quarry Water well Number is depth to bedrock, in feet where inferred; dotted where concealed Wind Gap and Inclined EXPLANATION OF MAP UNITS Holocene 94 QUATERNARY 92 Wisconsinan PleisTocene > Illinoian(3) Old: UNCON FORMITY Omb Hamilton Group midale Dm. Devonian DEVONIAN tults Dse UNCONFORMITY 0534 Sby SILURIAN Spi ORDOVICIAN(?) Ordovician(? Ssi SILURIAN Sosm UNCONFORMITY Omp Omb < Dines OR DOVICIAN ojl UNCONFORMITY Overturned syncline DESCRIPTION OF MAP UNITS where DUMPS-Waste blocks of slate from quarry operations in the Martinsburg Formation in piles locally exceeding 150 feet 1(46 m) in height, and slag piles from limestone operations OnearuStockertown Rotated more than 1800 ALLUVIUM-Silt, sand, and gravel in riverbed and flood-plain deposits of present streams SWAMP DEPOSITS-Organic matter and clay, probably with Sdisseminated silt and sand, vin poorly drained area GLACIAL DEPOSITS, UNDIFFERENTIATED-Gravel, sand, silt, and clay in till and stratified drift. More than 100 feet (30 m) thick in places. Weathered debris, lying up to 200 feet

(61 m) above Aquashicola and Ross Common Creeks and extending 2,500 feet (762 m) southwest of the mapped glacial deposits, has been identified as pre-Woodfordian (Altonian) till by G. G. Connally (Connally and Epstein, 1973). This material is difficult to distinguish from weathered colluvium and is not shown on the map. Its glacial origin has been questioned by Sevon and others (1975, p. 96) DRIFT-Deeply weathered grayish-orange to dark-yellowish-orange, light-brown to moderate-brown, and yellowish-red cobbly, silty, and clayey till. Boulders may be more than 3 feet (1 m) long. Generally less than 20 feet (6 m) thick. May include stratified drift in places. MAHANTANGO FORMATION-Medium-dark-gray to dark-gray, laminated to finely bedded, fossiliferous shaley siltstone and silty shale. About 2,100 feet (640 m) thick, but only lower 500

feet (152 m) are exposed in northeast corner of quadrangle.

Slickensides on cleavage

Slate or limestone quarry

Dm MARCELLUS SHALE-Upper 600-700 feet (183-213 m) consists of medium-dark-gray to grayish-black, laminated to poorly bedded, sparingly fossiliferous shale and silty shale that weathers light gray to medium gray, light brown to moderateyellowish brown, and dark-yellowish orange to grayish orange (Brodhead Creek Member). Lower part not exposed, but consists of about 150 feet (46 m) of medium-gray to mediumdark-gray, laminated to thin-bedded calcareous shaly siltstone and argillaceous limestone (Stony Hollow Member), and about 50 feet (15 m) of medium-dark-gray shale (Union Springs Member). Base probably sharp Db BUTTERMILK FALLS LIMESTONE-Fossiliferous cherty limestone and

calcareous shale and siltstone that have been deeply leached to a sedimentary-rock saprolite by pre-Wisconsinan weathering (Epstein and Hosterman, 1969). About 80 feet (24 m) of white and varicolored clay, silty clay, and chert. Lower contact sharp Dp PALMERTON SANDSTONE-Medium-dark-gray to very light-gray, mediumto very coarse-grained, generally massive sandstone and

conglomeratic sandstone with rounded quartz pebbles as much as 3/4 inch (2 cm) long. Rare favositid corals, crinoid columnals, and brachiopod molds. Weathers pale-yellowish orange to dark-yellowish orange and very pale orange to grayish orange. Lower contact sharp. About 100 feet (30 m) thick SCHOHARIE AND ESOPUS FORMATIONS, UNDIVIDED-Medium-light-gray to

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SOsm

cherty siltstone and silty shale. Abundant trace fossils, Taonurus. Weathers shades of orange, brown, and gray. Lower contact sharp. About 100 feet (30 m) thick RIDGELEY SANDSTONE OF THE ORISKANY GROUP-Light- to medium-gray, limonitic, fine- to thick-bedded, planar- to crossbedded, partly channeled, grayish-orange- and very pale-orange- to dark-yellowish-orange-weathering, fossiliferous (Acrospiriter), medium- to coarse-grained conglomeratic sandstone and conglomerate with quartz pebbles as much as 1 inch (2.5 cm) long. About 50 feet (15 m) thick. Lower contact placed at top of first chert bed encountered in

underlying Shriver Member

dark-gray, laminated to medium-bedded, fossiliferous, partly

SHRIVER CHERT OF THE ORISKANY GROUP AND NEW SCOTLAND FORMATION OF THE HELDERBERG GROUP, UNDIVIDED-Shriver Chert is weathered white to medium-light-gray chert, very light- to light-gray and moderate-brown, very fine- to medium-bedded, channeled and lenticular, friable coarse-grained sandstone and quartzpebble conglomerate with some ironstone concretions 3 inches (7.6 cm) in diameter, and white to very light-gray and paleyellowish-orange silty clay. Fossiliferous, with poorly preserved brachipods (Acrospirifer sp., Megakozlowskiella sp., Cyrtina sp., Coelospira sp., and Meristella sp.) and ostracodes (Bollia zygocornis Swartz, Ulrichia sp., Pyxiprimitia sp., Craterellina sp. aff. C. robusta Ulrich and Bassler, and Thlipsurella putea Coryell and Cuskley). About 70 feet (21 m) thick. Lower contact gradational. New Scotland Formation is weathered grayish-orange, pale- to dark-yellowish-orange, light-brown, and very light-gray to white, silty and sandy clay, very light-gray to light-gray chert in lentils 1-4 inches (2.5-10 cm) thick, and minor 1inch- (2.5 cm) thick interbedded sandstone. Fossiliferous, with brachiopods (Meristella sp., Leptaena

T. oblonga (Ulrich and Bassler). The New Scotland may include younger rocks of the Helderberg Group that are not distinguishable southwest of the Saylorsburg quadrangle (Epstein, 198_; Epstein and Epstein, 1969, p. 144). About 35 feet (11 m) thick. Lower contact sharp STORMVILLE MEMBER OF THE COEYMANS FORMATION OF THE HELDERBERG GROUP AND DECKER FORMATION, UNDIVIDED-Stormville Member is weathered very pale-orange to dark-yellowish-orange, lightbrown, light-grayish-orange, and very pale-orange-pink, planar bedded and crossbedded, fine- to coarse-grained, partly friable sandstone, lesser conglomerate with quartz pebbles as much as 1 inch (2.5 cm) long, and minor sandy clay. Fossiliferous (crinoid columnals, Gypidula sp. Meristella sp., Favosites, and a strophomenid brachipod). About 45 feet (14 m) thick. Lower contact sharp and irregular. Decker Formation is weathered, limonitic, hematitic, light-brown to reddish-brown and very pale-orange to dark-yellowish-orange clayey shale, siltstone, and very

"rhomboidalis" (Wilckens), "Schellwienella" sp. cf. "S"

wollworthana (Hall), and ostracodes (Thlipsurella sp. aff.

BOSSARDVILLE LIMESTONE-Medium- to dark-gray and lesser pinkishgray and greenish-gray, light- to medium-light-grayweathering, very fine-grained, argillaceous and pyritic, laminated to thin-bedded, rippled limestone that is mudcracked in many places. Abundant leperditiid ostracodes. About 100 feet (30 m) thick. Base not exposed, but probably sharp

as 100 feet (30 m) thick. Base not exposed

fine- to medium-grained, thin- to medium-bedded, lenticular

sandstone. At least 45 feet (14 m) thick; possibly as much

POXONO ISLAND FORMATION-Light-olive-gray to greenish-gray and medium-gray, calcareous and dolomitic, light-gray- and yellowish-gray-weathering shale, medium-gray to greenishgray, laminated to medium-bedded, very fine-grained, yellowish-orange- to yellowish-gray-weathering, calcareous, and mudcracked dolomite, and medium-light-gray to mediumgray, pale- to dark-yellowish-orange-weathering, very finegrained limestone. About 650 feet (198 m) thick, with considerable tectonic thickening and thinning. Base not exposed but probably transitional

BLOOMSBURG RED BEDS-Pale-red to grayish-red-purple and greenishgray to pale-green, crossbedded to planar bedded, very fineto coarse-grained, thin- to thick-bedded, partly conglomeratic sandstone; and pale-red to grayish-red-purple, grayish-green, pale-green, and greenish-gray, shale and siltstone with prominent cleavage, partly mud-cracked and with scattered ferroan dolomite concretions. Upward fining cycles, with basal channel sandstones are abundant. Lower contact not exposed. About 1,500 feet (457 m) thick

SHAWANGUNK FORMATION

TAMMANY MEMBER-Medium-gray to medium-dark-gray, fine- to coarse-grained, planar-bedded to crossbedded, limonitic, thin- to thick-bedded, conglomeratic quartzite with quartz and argillite pebbles as much as 2 inches long. Lower contact transitional. About 450 to 550 feet (137-168 m) thick. Thins to a feather edge 0.65 mile (1 km) to the west in the Kunkletown quadrangle. The Very light to light gray

LIZARD CREEK MEMBER-Medium-light-gray to dark-gray and lightolive-gray, very fine- to coarse-grained, laminated to thick-bedded, crossbedded, flaser-bedded, partly channeled, limonitic, grayish-orange- to dark-yellowish orangeweathering, burrowed quartzite containing some flattened argillite pebbles, interbedded with abundant medium-gray to dark-gray laminated to fine-bedded, flaser-bedded, burrowed siltstone and shale. Lower contact transitional and placed at base of lowest argillite in sequence of abundant argillite. Thickness ranges from about 600 feet (183 m) to 670 feet (204 m)

MINSI MEMBER-Very light-gray to dark-gray and moderategreenish-gray, fine- to coarse-grained, conglomeratic sandstone with quartz pebbles as much as 0.5 inch (1.3 cm) long and argillite clasts as much as 5 inches (13 cm) long, planar bedded to crossbedded, laminated to thick-bedded, partly burrowed, light-brown- and grayish-orange- to darkyellowish-orange-weathering quartzite, and minor mediumdark-gray to dark-gray siltstone and shale. Lower unconformable contact not exposed; covered by thick apron of talus along the south slope of Blue Mountain. About 250-325 feet (76-99 m) thick west of the Saylorsburg quadrangle

MARTINSBURG FORMATION

sandstone float

PEN ARGYL MEMBER-Dark-gray to grayish black, thing to thick-GROU bedded (beds are commonly more than 10 feet (3m) thick), evenly bedded slate rhythmically interbedded with carbonaceous slate, sandy slate, and very fine- to mediumgrained graywacke with parallel laminations, lenticular bedding, convoluted bedding, and sole marks. Units in upward-fining cycles (turbidite-flysch sequence). Quarried extensively for slate ("soft slate" belt of Pennsylvania quarrymen). Probably more than 5,000 feet (1,574 m) thick; upper half not exposed in quadrangle. Lower contact transitional and placed where graywacke is in excess of about 5 percent of local sequences and supplies abundant

fine- to medium-grained, thin- to medium-bedded, lenticular

RAMSEYBURG MEMBER-Medium- to dark-gray slate alternating, in part cyclically, with light- to medium-gray, thin- to very thick-bedded graywacke and graywacke siltstone (turbidites). Graywacke comprises about 20 percent of member, but may be more than 50 percent of some thick parts of the section, and less than 5 percent in others. Slates are generally thick bedded at the top and finer bedded at the bottom of the member. About 2,800 feet (853 m) thick. Lower contact placed at base of lowest prominent graywacke bed, recognized by abundant float, but contact may be transitional through several hundred feet, where discontinuous and lenticular graywacke beds are mapped in the underlying Bushkill Member. The mapped contact is probably more complicated than shown because of folding, faulting, and poor exposures. Quarried for slate in upper part of member

BUSHKILL MEMBER-Medium- to dark-gray, laminated to thin-bedded slate with thin beds of quartzose and graywacke siltstone and carbonaceous slate in upward-fining sequences. Bed thicknesses do not exceed 6 inches (15 cm) throughout member, and is generally less than 2 inches (5 cm) thick, except for graywacke beds that probably do not exceed 1 foot (0.3 m) in thickness in discontinuous units near the top of the member (Ombs). Within the basal 250 feet (76 m) along Bushkill Creek are seven medium-dark-gray, dense micaceous and quartzose dolomite beds that are 8 to 12 inches (20-30 cm) thick and which form foliation mullions. Lower contact transitional through 3 feet (1 m) on Bushkill Creek. Elsewhere placed at prominent break in slope. Member is about 4,000 feet (1,220 m) thick, but complex folding and faulting makes this figure an approximation. Formerly quarried for slate ("hard slate" belt of

JACKSONBURG LIMESTONE

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Pennsylvania quarrymen)

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UPPER MEMBER ("cement rock" facies of Miller, 1937)-Dark-gray to grayish-black, argillaceous and carbonaceous limestone with well-developed slaty cleavage, and lesser interbedded medium-dark-gray, very fine- to medium-grained limestone. Weathers to light-medium-gray clayey saprolite in places, but still has not had all calcium carbonate leached out. Lower contact transitional and difficult to map. Thickness about 750 feet (229 m) LOWER MEMBER ("cement limestone" facies of Miller, 1937)-

Medium-dark-gray to grayish-black, very fine- to thickbedded, very fine- to coarse-grained, fossiliferous (bryozoans, brachiopods, and gastropods) limestone and argillaceous limestone. Weathers light-gray to medium-dark gray and light-olive gray. Karstic. Lower contact not observed, but sharp. Thickness about 400 feet (122 m). Many of the rocks mapped as upper member in the Hercules quarry in Stockertown were mapped as cement rock facies by Sherwood (1964)

BEEKMANTOWN GROUP

0e EPLER FORMATION-Fine- to medium-grained, medium-light-gray to dark-gray cherty dolomite and limestone. No exposures in quadrangle. About 800 feet (244 m) thick

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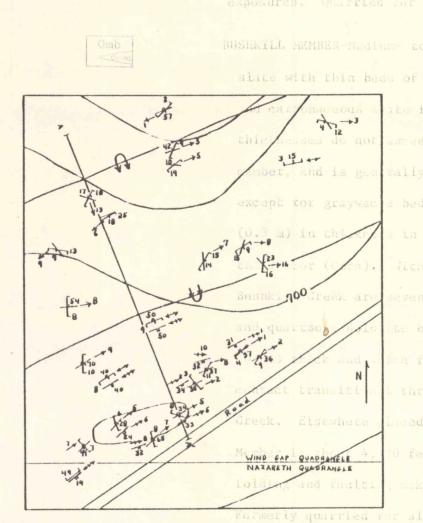
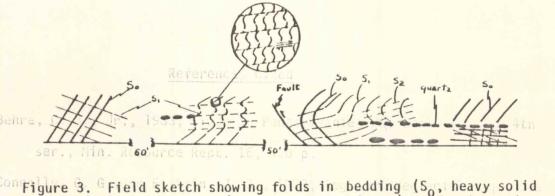


Figure 1. Map and cross section showing tight folding and arching of slaty cleavage in the Bushkill Member of the Martinsburg Formation in a sanitary landfill area, 1.5 miles (2.4 km) west of Narzreth, along the southern border of the Wind Gap quadrangle. In cross section solid lines are bedding, long dashed lines are slaty cleavage, and short dashed lines are slip cleavage

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Figure 2. Geologic map and cross section showing folding in flat-lying rocks of the Bushkill Member of the Martinsburg Formation in the abandoned Theo. Whitesell slate quarry (see Behre, 1939, p. 261), 1.5 miles (2.4 km) north of Stockertown



lines), slaty cleavage (S_1 , long dashed lines), and orientation of second-generation slip cleavage (S_2 , short dashed lines) with related to inferred faulting in the Jacksonburg Limestone along Bushkill Creek near Stockertown, 700 feet (213 m) south of Pa. Route 191. Vein quartz (solid circles) fills faults and shear zones

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