STATE OF NEW JERSEY
DEPARTMENT OF CONSERVATION AND DEVELOPMENT
ATLAS SHEET No. 40

DIVISION OF GEOLOGY AND TOPOGRAPHY
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BASE SURVEYED UNDER DIRECTION OF
C. C. VERMEULE. 1877-1887

GEOLOGIC MAP OF NEW JERSEY

Compiled from published folios and from manuscript data in possession of the Survey, the latter chiefly the field work of
W. S. BAYLEY, (Pre-Cambrian)
H. B. KÜMMEL, (Paleozoic, Triassic, Quaternary)
R. D. SALISBURY, (Quaternary)
G. N. KNAPP, (Cretaceous, Tertiary, Quaternary)

BY

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1910-1912

REVISED BY H. B. KÜMMEL, 1931

SCALE: 1:250,000 (approximately 4 miles to an inch)

4 0 4 8 12 16 Miles

LEGEND

SEDIMENTARY ROCKS

TERTIARY

Beacon Hill Gravel
Quartz gravel with some chert and sandstone pebbles.

(UNCONFORMITY)

Cohansey Sand
Chiefly quartz sand with local beds of clay and gravel; silicified wood.

(UNCONFORMITY)

Kirkwood Sand
Fine Miocene sand with local beds of dark clay. (Alum.)

(UNCONFORMITY)

Shark River Marl
Mottled, glauconitic, sandy marl; light colored earth, chiefly work of Asbury Park.

Manasquan Marl
Dark green glauconitic marl; contains by an ochlike mixture of the quartz sand and greyish white clay.

Vincentown Sand
Glauconitic quartz sand alternating with beds of lime rock (casts of fragments, etc.), the latter mostly concealed.

Hornerstown Marl
Dark green glauconitic marl with varying amounts of quartz, fine earth, and clay. Marked shell bed at the top. Beds of Aplocrinite rock on Navesink marl below.

(UNCONFORMITY)

CRETACEOUS

Red Bank and Tinton Sands
Red, micaceous, quartz sand, with local clay materials. In Monmouth County overlain by a bed of hard green clayey and sandy loam (Tinton).

Navesink Marl
Dark green glauconitic marl; contains much shell marl at the base. Beds of Aplocrinite underlie the Hornerstown marl strata.

Mount Laurel and Wenonah Sands
Quartz sand and clay. Mount Laurel (lower) overlying fine micaceous sand (Wenonah).

Marshalltown Formation
Black sandy clay to clayey glauconitic marl.

Englishtown Sand
White and yellow quartz sand with little mica and glauconite and local thin layers of clay.

Woodbury Clay
Black to dove-colored clay, usually nonglauconitic.

Merchantville Clay
Black sandy clay, usually glauconitic.

Magothy and Raritan Formations
Dominantly white and light colored clay, commonly containing finely divided lignite; also white and yellow quartz sand (formerly variable sands and clays, chiefly light colored (Raritan).

(UNCONFORMITY)

TRIASSIC
(NEWARK GROUP)

Hemlock Formation
Soft red shale with sandstone bulk, the latter more abundant toward the northeast; conglomerate beds (Trc) along northwest border with pebbles or limestone pebbles in red matrix.

Lockatong Formation
Hard dark argillite with local thin beds of sandstone (Lockatong), conglomerate beds (Trc) along north. border with pebbles or limestone pebbles in red matrix.

Stockton Formation
Gray feldspathic sandstone (arkose), conglomerate, and red shale; conglomerate beds (Trc) along northeastern border with pebbles or limestone pebbles in red matrix.

(UNCONFORMITY)

DEVONIAN

Skunnemunk Conglomerate
Coarse white quartz pebbles in red sandy matrix with frequent beds of red sandstone. (North central area).

Bellvale Sandstone and Poquanac Shale
Sandstone, flagstone, and shale, the latter chiefly red; gray shale (Poquanac). (North central area).

Marcellus Shale and Onondaga Limestone
Plastic black shale (in Delaware River region a limestone) overlying thin-bedded cherty limestone.

Kanouse Sandstone
Greenish sandstone slates and light colored sandstone and conglomeratic layers. (North central area).

Encopta Grit
Dark coarse sandstone with strong olivenspa. (Northeastern area).

Oriskany and Becraft Limestones
(Including Port Ewen beds)
Siliceous limestone, the latter commonly occurring in nodules), separated from the gray cherty Becraft limestone below by a formation (provisionally Port Ewen beds) of dark calcareous shale cemented by limey gritstone. (Northeastern area).

New Scotland, Stormville and Coeymans Formations
Hard cherty limestone and limy shale (New Scotland) overlying massive gray limestone (Stormville) separated and underlaid by a thin sandy bed (Coeymans). (Northeastern area).

SILURIAN

Late Silurian Formations
Argillaceous and arenaceous limestone, the former chiefly in the upper part, the latter in the lower part (Manlius); cherty shale and limestone (Rondout); thin bedded limestone and calcareous shale, forming newly continuous (Decker), bedded black-gray limestone (Shawangunk conglomerate); and greenish limy shale (Poxino Island).

Decker Limestone and Longwood Shale
Impure siliceous and shaly limestone (Decker) and dark shale and limestone (Longwood). (North central area).

High Falls Formation
Shale and sandstone and red shale, the latter more abundant near the top. (North. central area).

Green Pond Conglomerate
Conglomerate of white quartz pebbles in white quartzose matrix, with beds of coarse hard sandstone.

Shawangunk Conglomerate
Conglomerate of white quartz pebbles in white quartzose matrix, with beds of coarse hard sandstone.

(UNCONFORMITY)

ORDOVICIAN

"Hudson River"
Black shale shale (overlay shale in places) and thin beds of limestone (Lyellville), especially in upper parts.

Hudson Schist
Mica schist with some gneiss (Jersey City and Bibbleton).

(UNCONFORMITY)

Jacksonburg Limestone ("Trenton")
Black and dark limestone, the latter commonly concentric at the base and long shale ("normal rock") at the top.

(UNCONFORMITY)

CAMBRO-ORDOVICIAN

"Kittatinny" Limestone
Upper—Thin and thick, gray or blue cherty magnesian limestone (Upper Cambrian); Ordovician?
Middle—Light and dark, mottled, bedded limestone with cryptozoon heads (Upper Cambrian); Cambro-Ordovician.
Lower—Massive blue, blue-gray limestone with pebbles or silvery chert (Lower Cambrian). (South of Greenwood Lake, a narrow band of Hardyston conformed).

CAMBRIAN

Hardyston Sandstone
Variably hard sandstone usually containing feldspar; locally a conglomerate with pebbles of white quartz. (South of Greenwood Lake, a narrow band of Hardyston is confined on map with (Cb).

(UNCONFORMITY)

PRE-CAMBRIAN—METAMORPHIC

Wissahickon Mica gneiss
A banded, micaceous feldspar rock with an excess of biotite (about Trenton).

Franklin Limestone
Coarse white marble, serpentine in part, containing graphite, chondrodite, pyroxene, and other minerals, (Franklin and Sterling Hill, Sussex County. Includes some gneiss near Phillipsburg.

IGNEOUS ROCKS

TRIASSIC
(NEWARK GROUP)

Basalt Flows
Fine-grained to glassy basalt flows, chiefly in the Watchung Mountains; in part metadiase.

Diabase
Coarse-grained trap rock, chiefly intrusive sheets in the Newark formations. Also dikes, a few basaltic (Bsd).

POST-ORDOVICIAN

Serpentine
Form fragments of basic igneous rock (Diabase and Gabro Group).

Nephelite Syenite
Intrusive mass of gray coarse to fine-grained rock in Sussex County.

Basic Volcanic Breccia
Numerous fragments of basalt, diabase and gneiss inclosed in a matrix of basic lava (consolidated filling old volcanic vents (Sussex County).

PRE-CAMBRIAN

Granite
Coarse-grained, ruddy foliated hornblende granite, rich in zircon, titanite, and allanite (Northern border of Sussex County).

Diabase
Including hypersthene gabbros and norite (about Preakness).

Losee Gneiss
White granitoid gneiss composed of microcline, microperthite, quartz, and occasionally perthite, hornblende, and biotite.

Byram Gneiss
Gray granitoid gneiss composed of microcline, microperthite, quartz, and hornblende, with accessory titanite, allanite. Includes small areas of Byramite gneiss at Byram.

METAMORPHIC ROCKS OF UNKNOWN ORIGIN

Pochuck Gneiss
Dark granular gneiss composed of pyroxene, hornblende, hypersthene, and magnetite. Probably igneous in part.

UNKNOWN

Formation not determined
Drift near thick and sandstones; bed rock unknown.

FAULTS

NOTE.—Some small isolated areas of the Quaternary, chiefly of Glacial drift, are not shown on the map; omitted; also numerous segregation, amphibolite limpsite and composite dikes.

NOTE.—Dips are shown in the Franklin limestone; magnetic iron ore in the Byram, Losee and Pochuck gneisses; worthwhile area of copper map ocurs in the Newark group; materials building stone is obtained from the Losee and Byram gneisses, Franklin limestone, Hardyston quartzite, Newark trap rock, and lime from the Franklin, Kittatinny, Hardyston, and the limestones in the Kittatinny limestone valley; crushed stone manufactured from the Franklin and Kittatinny limestone; crushed stone manufactured from the Hardyston, Shawangunk conglomerate (trap rock) in the Newark group; clay chiefly from the Raritan, Magothy, Woodbury, Merchantville, Hornerstown, Vincentown, Kirkwood, and some deposits of glacial origin; glass sand from the Cohansey; greensand marl from the Navesink, Hornerstown, Manasquan, and Shark River formation.

QUATERNARY

Surface covering of variable thickness, generally unconsolidated.

GLACIAL

NOTE.—A sheet of stony clay of variable thickness (left, unstratified drift, or "moraine clay") covers most of the surface and in the terminal moraine, lies in irregular mounds on the surface.

Terminal Moraine of the last (Wisconsin) glacial epoch
A belt of irregular, hummocky accumulations of clay, sand, gravel, and boulders, in confused mixture.

Recessional Moraine
Similar to terminal moraine. Smaller moraine accumulations north of the terminal moraine, including some stratified drift of kame-like form, and marking pauses in the retreatm of the ice-sheet.

Stratified Drift (Wisconsin)
Sand and gravel plains, deltas, valley, kames, and kame terraces, built by waters from the melting ice in the valleys leading south from it. Also include fine sand, gravel, and clay deposits of the extinct Lake Passaic.

Shore Line of Lake Passaic
(180 ft.)
Broken line indicates approximate location.

Early Drift
Remnants of glacial drift, both stratified and unstratified, left by the ice in Wisconsin, south of the terminal moraine.

MONGLACIAL

NOTE.—Weathered residual clay, sand and gravel included and not shown on the map; some the surface at many places in the Coastal Plain.

Beach Sand and Gravel
Bodies of sand and gravel, chiefly of the present, the surrounded, but elsewhere sharply distinguished from Cape May formation.

(UNCONFORMITY)

Cape May Formation (Wisconsin)
Sand, gravel, and clay.
Low terraces and plains of gravel and sand, with some clay. Merges into stratified drift in Delaware and Raritan valleys.

(UNCONFORMITY)

River Drift
Higher terraces of the upper Raritan valley.

(UNCONFORMITY)

Pensauken Formation (Interglacial or Lafayette?)
Gravel and sand on higher terraces, capping hills and slanden, and covering some plains.

(UNCONFORMITY)

Bridgeton Formation (Probably earliest glacial and interglacial age)
Gravel and sand, in part solidified by ironoxide, forming conglomerate and sandstone. Includes strata of the Ancora Pebble and Belleplain series.

(UNCONFORMITY)

Section A-A.—Dingman's Ferry to Hoboken. Scales: Horizontal, 1/250,000; Vertical, 1/50,000; Vertical exaggeration 5x.

Section B-B.—From Pixino Island, Delaware River to Raritan River, near South Amboy. Scales: Horizontal, 1/250,000; Vertical, 1/50,000; Vertical exaggeration 5x.

Section C-C.—Phillipsburg to Bordentown. Scales: Horizontal, 1/250,000; Vertical, 1/50,000; Vertical exaggeration 5x.

Section C-D.—Bordentown to Peahala. Scales: Horizontal, 1/250,000; Vertical, 1/50,000; Vertical exaggeration 5 .

Section E-E.—Camden to Erial, showing sequence, relation, and structure of Cretaceous, Tertiary and Quaternary strata. Horizontal scale, 1/50,000; (Vertical scale ten times the horizontal.)

ATLANTIC OCEAN

DELAWARE BAY

RARITAN BAY

NEW YORK BAY

LAKE HOPATCONG

LAKE HOPATCONG

LAKE DENMARK

LAKE DENMARK

LAKE DENMARK