UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

PROFESSIONAL PAPER 638
PLATE 1

GEOLOGIC MAP OF THE FRANKLIN QUADRANGLE AND PART OF THE HAMBURG QUADRANGLE, NEW JERSEY

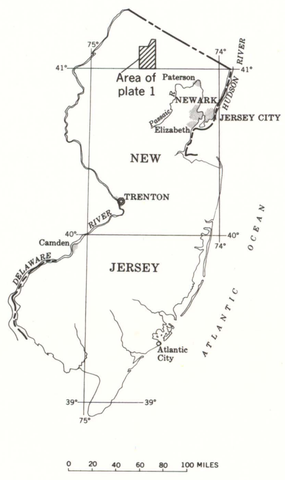
SCALE 1:24 000

1 ½ 0 1 MILE

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

APPROXIMATE MEAN DECLINATION, 1970



STRUCTURE SYMBOLS

Contact
Dashed where approximately located

Fault
Dashed where approximately located; dotted where concealed; U, upthrown side; D, downthrown side

Anticline
Showing crestline

Syncline
Showing troughline

Overturned anticline
Showing crestline and direction of dip of limbs

Overturned syncline
Showing troughline and direction of dip of limbs

75 Inclined — Vertical
Strike and dip of foliation

35
Bearing and plunge of lineation
May be combined with symbol for foliation

Shaft — Mine

Franklin and Sterling Hill zinc deposits

Mines and prospects
1. Edison deposits
   - *1A* -Copper shaft
   - *1B* -Iron Hill cut
   - *1C* -Victor mine
   - *1D* -Condon cut
   - *1E* -Roberts mine
   - *1F* -Old Ogden mine
   - *1G* -Davenport
   - *1H* -Big cut
   - *1J* -Vulcan mine
2. Sherman-Bunker deposits
3. Dodge
4. Ford
5. Schofield
6. Duffee
7. Goble
8. Woods

74°30′ — 860 000 FEET — 41°11′30″ — 2 040 000 FEET — 32′30″ — 10′ — 35 — 07′30″ — 5′ — 2′30″

74°37′30″ — 41°07′30″ — 35′ — 32′30″ — 41°00′ — 74°30′

EXPLANATION

SEDIMENTARY ROCKS

SILURIAN AND DEVONIAN

DS — Conglomerate, sandstone, shale, and limestone undivided

CAMBRIAN AND ORDOVICIAN

O€ — Sandstone and limestone undivided

IGNEOUS ROCKS

TRIASSIC

Id — Diabase
Dark fine-grained to aphanitic thin sheets and dikes

PRECAMBRIAN

HORNBLENDE GRANITE AND RELATED FACIES

gpe — Granite pegmatite
Pink to white, coarse grained and massive. Composed principally of microcline microperthite, quartz, and sodic plagioclase

ga — Alaskite
Pink medium-grained gneissoid granitic rock composed principally of mesoperthite (approximately 40–60 percent of rock) and quartz (commonly more than 30 percent), with plagioclase and less than 5 percent mafic minerals, including hornblende, biotite, ilmenite and magnetite, zircon, and apatite. Accessory fluorite is common (as much as 1 percent). Locally contaminated with hornblende from amphibolite schlieren

gh / ghc — Hornblende granite
Pink to buff medium-grained gneissoid granite (gh) composed principally of mesoperthite (approximately 35–60 percent of rock) and quartz (average, approximately 20 percent), with subordinate perthitic microcline and oligoclase and some hornblende (commonly less than 10 percent). Minor accessory minerals are biotite, ilmenite, magnetite, apatite, and zircon. Locally contains amphibolite inclusions and alaskitic facies. Locally, some facies (ghc) are much contaminated from incorporated mafic gneiss

PYROXENE SYENITE AND RELATED FACIES

gap — Pyroxene alaskite
Greenish to white medium-grained gneissoid to massive rock composed principally of microantiperthitic mesoperthite (average approximately 60 percent of rock), and quartz (30–35 percent). Minor accessory minerals are clinopyroxene and (or) hornblende, ilmenite, magnetite, apatite, zircon, and sphene. Amphibolite inclusions are common

gp / gph — Pyroxene granite
Mostly ferrohedenbergite granite (gp) with local border facies of hypersthene granite (gph) west of Camp Acquackanonk (Franklin quadrangle). Granite is greenish to buff, gray weathering, and gneissoid. It is composed principally of microantiperthitic mesoperthite (50–75 percent of rock), quartz (15–35 percent), and contains accessory pyroxene (ferrohedenbergite, average 2–5 percent), and minor amounts of titaniferous magnetite, zircon, apatite, ilmenite, and sphene

syp — Pyroxene syenite
Dark- to light-green, gray-weathering, medium-grained gneissoid syenite composed principally of microantiperthitic mesoperthite (70–80 percent of rock), quartz (less than 10 percent), and pyroxene (ferrohedenbergite, 6–7 percent of rock). Titaniferous magnetite (ilmenomagnetite) is the major opaque oxide mineral (2–6 percent); rock contains small amounts of zircon, apatite, ilmenite, and sphene

ORTHOGNEISS

gns — Syenite gneiss
Hornblende and pyroxene syenite gneiss formed from igneous rocks by metamorphism. Very uniform, green medium-grained gneiss with granoblastic texture; original igneous texture preserved locally. Pyroxene syenite gneiss in belt southwest from Beaver Lake, Franklin quadrangle; hornblende syenite gneiss elsewhere, both quadrangles. Hornblende syenite gneiss is composed of oligoclase (average, 45 percent of rock), microcline and microperthite (average, 40 percent), some hornblende (ferrohastingsite, 7–14 percent of rock), and accessory clinopyroxene. Pyroxene syenite gneiss contains clinopyroxene (ferroaugite, average 4 percent of rock). Other accessory minerals in both rocks are quartz, titaniferous magnetite, ilmenite, zircon, and apatite

METASEDIMENTARY ROCKS

The age relations of the following rocks are imperfectly known

gnh — Hypersthene-quartz-oligoclase gneiss
White, light-buff, or green medium-grained gneiss composed of hypersthene (3–5 percent), brown biotite (0.5–3 percent), or green hornblende (2–5 percent), oligoclase (60–70 percent), microcline (3–6 percent), and quartz (17–23 percent). A few tenths of 1 percent disseminated graphite is characteristic. Amphibolite layers locally. Contains a few sheets of hornblende granite, alaskite, and pegmatite

gna — Garnetiferous gneiss and amphibolite
Interlayered garnetiferous biotite-quartz-feldspar gneiss (see gnb below) and amphibolite with sheets of granite and locally pyroxene-quartz-plagioclase gneiss

gnp — Pyroxenic gneiss
Dark-green to dark-gray medium-grained commonly layered clinopyroxene-plagioclase and pyroxene-quartz-plagioclase gneiss. Amount of clinopyroxene varies from less than 1 percent to more than 40 percent; quartz varies from 0 to 40 percent, but commonly is 20 to 40 percent; in most specimens plagioclase is 50 to 60 percent. Microcline is present in some facies of gneiss; scapolite is present in place of plagioclase in some. Hornblende may accompany pyroxene. Apatite, iron oxides, and sphene are common accessory minerals. Lenticular sheets of intrusive granite, alaskite, and pegmatite and layers of amphibolite occur throughout all the belts

mls — Marble
White to gray coarse to locally fine-grained crystalline rock that varies from impure calcite to almost pure dolomite. Commonly contains some disseminated graphite, grains of phlogopite, clinopyroxene, and tremolite. Chondrodite, pyrrhotite, pyrite, scapolite, and quartz occur locally. Contains lenses of granite and pegmatite, and a few lenses of quartz-rich gneiss inferred to have been originally sandy beds

gnbg / gnbh — Biotite-quartz-feldspar and associated gneiss
gnbg, *light-colored medium-grained gneiss predominantly composed of quartz, oligoclase, microcline, accessory biotite, and locally garnet. Contain local layers of amphibolite and quartz-microcline gneiss. In Mount Paul belt, hypersthenic in part and associated with pegmatite-seamed, garnetiferous biotite-quartz-plagioclase gneiss (gnb), sillimanite-garnet-quartz-microcline gneiss, and pyritic quartz-rich gneiss; and lenses of granite pegmatite. Northwest of Hamburg fault, gneiss is garnetiferous*
gnbh, *biotite-quartz-plagioclase gneiss with interlayers of hornblende-plagioclase gneiss and amphibolite. Interlayered with garnetiferous quartz-feldspar gneisses northwest of Oak Ridge Reservoir*

gne — Epidote-scapolite-quartz gneiss and associated rocks
Epidote-scapolite-quartz gneiss interlayered with pyroxenic and hornblendic quartz-microcline gneiss and subordinate pegmatite-seamed biotite-quartz-feldspar gneiss. Weathered surfaces characteristically have a thin-layered or ribbed appearance

gnm — Quartz-potassium feldspar and associated gneiss
Biotitic, garnetiferous, and sillimanitic quartz (35–66 percent)-microcline (17–52 percent) gneisses. Plagioclase less than 10 percent, or absent in many specimens. Characterizing accessories range from 1 to 12 percent. Contain quartz-microcline gneiss, seams of granite pegmatite, and locally layers of amphibolite. Contain magnetite depposits near Edison and north of Lake Saginaw, Franklin quadrangle. Potassium feldspar is untwinned in magnetitic gneisses

gnph — Miscellaneous gneiss
Belts of gneiss whose rocks are heterogeneous and cannot clearly be mapped under one of the foregoing classifications. Includes quartz-bearing hornblende and pyroxene-plagioclase gneisses, pyroxene-plagioclase gneiss, biotitic mafic gneisses with local interbeds of sillimanitic or garnetiferous quartz-microcline gneiss, and local lenses or seams of granite pegmatite

ROCKS OF UNCERTAIN ORIGIN

gm — Quartz-microcline gneiss
Pinkish fine- to medium-grained rock, varying from nearly homogeneous granulite to foliated granitic gneiss. Composed of quartz (30–42 percent), microcline (42–60 percent), and variable amounts of sericitized plagioclase (less than 1–20 percent). Commonly contains accessory garnet. Other accessories are biotite, sillimanite, muscovite, magnetite, and ilmenite. Occurs as a small lens northeast of Edison, Franklin quadrangle, and as a crescent-shaped body northeast of Lake Wildwood, Hamburg quadrangle

gno — Quartz-oligoclase gneiss
White-weathering medium-grained gneiss containing oligoclase (59–72 percent), quartz (24–36 percent), minor orthoclase (less than 1 percent), and some biotite (1–2 percent). Characteristically contains shredded aggregates of chlorite and epidote, possibly derived from hornblende or pyroxene. Commonly has local included layers of pyroxenic amphibolite; locally sparsely garnetiferous. Corresponds in part, at least, to the Losee diorite gneiss of Spencer (1908, p. 5), named for Losee Pond, which now is called Beaver Lake

gnb — Biotite-quartz-plagioclase gneiss (graphitic quartz-microcline gneiss shown by pattern)
Predominantly light medium-grained biotite-quartz-plagioclase gneiss in Pimple Hills. Locally contains layers of amphibolite; in Pimple Hills contains a thin layer of graphitic quartz-microcline gneiss

gaa — Albite alaskite
Medium-grained alaskite in two belts northwest of the Pimple Hills, Franklin quadrangle. Composed mainly of quartz and albite, with accessory hornblende

amg — Amphibolite
Medium-grained hornblende and pyroxene amphibolite; commonly migmatitic where injected by granite and alaskite

Base from U.S. Geological Survey, 1954

Geology mapped by D. R. Baker and A. F. Buddington, 1951–53

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