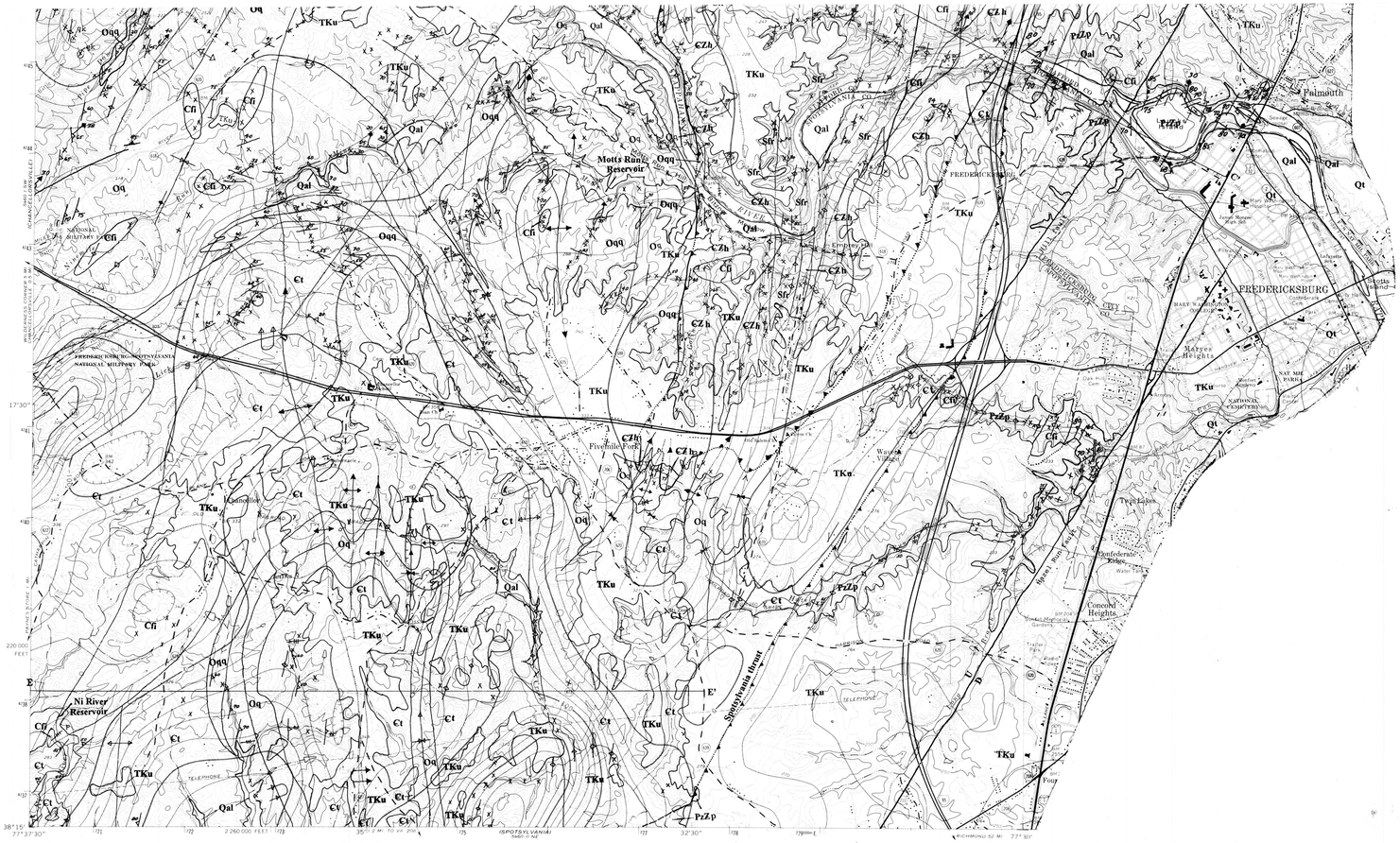

DESCRIPTION OF MAP UNITS

Post-Paleozoic rocks and sediments

Qal Alluvium (Quaternary)--Sand, gravel, silt, and clay; brown to gray and gray green. In stream channels and flood plains. Grades into colluvium along margins of some streams. Locally may include swamp deposits

Qt Terrace deposits (Quaternary)--Sand, gravel, and silt along stream terraces. Locally may include minor amounts of colluvium

TKu Upland deposits and Coastal Plain sediments (lower Tertiary and Early Cretaceous)--Includes gravel, sand, silt, and clay as well as glauconitic sand, sparse sandy limestone and locally cross bedded quartzofeldspathic sand. Locally may include colluvium on slopes into stream valleys

Id Diabase dikes (probably Jurassic)--Crystalline, medium- to fine-grained, dark-gray to black generally intergranular to ophitic textured basaltic rocks. Predominantly hytownite-augite diabases with opaques and locally minor biotite as common accessory. Less common diabase contains fayalitic olivine with hytownite more calcic than olivine-free diabase

Paleozoic and Proterozoic Rocks

Metasedimentary and metavolcanic rocks

Back-arc terrane

(melange deposit)

OCl Lunga Reservoir Formation (Ordovician and/or) Cambrian?)--Diamictite-type melange composed of a nonstratified micaceous quartzofeldspathic rock (metagraywacke) that characteristically contains quartz lumps that include granules, pebbles, and less commonly boulders of quartz. It also contains chips and pebbles of gneiss and schist, some with an internal foliation that is athwart that of the enclosing metagraywacke. The milieu of metagraywacke, quartz lumps and schist and gneiss chips are the matrix that enclose exotic blocks of greenstone and metamafic rocks and metavolcanic rocks of the Chopawamsic Formation north of the map area.

Island arc terrane

Cc Chopawamsic Formation (Lower Cambrian?)--Consists of lenses and tongues of metavolcanic and metasedimentary rocks and lacks single units with great lateral extent. Metavolcanic rocks include silicic, intermediate, and mafic varieties, some of which probably were flows, as suggested by their highly vesicular character. Fragmental rocks are mainly breccias and tuffs. Many fine-grained feldpathic schists and phyllites without identifiable fragments are similar mineralogically and chemically to the more distinctive volcanic rocks and may be tuffaceous. Schists, meta-arenites, and locally, amphibole-free gneisses of probable sedimentary origin are interlayered with the clearly metavolcanic rocks, and the proportion of such metasedimentary rocks varies from place to place along the formation. Silicic metavolcanic rocks typically are light gray and some have small phenocrysts of quartz and/or feldspar. Some felsic metavolcanic rocks contain albitic plagioclase and quartz in a finer grained quartzofeldspathic groundmass and are keratophyres. The intermediate metavolcanic rocks are dark to light green, and commonly have a nematoblastic groundmass texture formed by aligned prismatic amphibole intergrown with fine-grained quartz and feldspar. Mafic rocks of the Chopawamsic Formation include amphibolitic greenstone, and various dark schists

Ct Ta River Metamorphic Suite (Cambrian?)--The characterizing rocks of the Ta River Metamorphic Suite are generally dark-gray to black, well-foliated amphibolitic gneisses associated with conformable granitoid rocks and smaller amounts of biotite gneiss and schist

CZgm Garrisonville Mafic Complex (Late Cambrian? or Late Proterozoic)--Fine- to coarse-grained, melanocratic, massive- to foliated metamafic rocks. Metamafic rocks are chiefly amphibolite and hornblendite with lesser amounts of metapyroxenite (enstatite-bearing), metawebsterite, and metanorite in the western part of the complex. Metamorphic alteration is less intensive in the western part of the complex. Also, at the west edge of this complex, talc-amphibolite schist occurs near the contact with the country rock

Successor basin terrane

Oq / **Oqq** Quantico Formation (Upper Ordovician)--A dark-gray phyllite and micaceous fine- to medium-grained staurolite schist and biotite- muscovite garnetiferous schist that locally contains quartz-kyanite veins. Diopsidic calc-silicate layers are present locally. Quartzite (Oqq) forms thin discontinuous lenses within the formation and locally at its base

Ou Metasedimentary rocks, undivided (Ordovician)--Gray to green silty phyllite, gray to white metasiltstone and fine-grained quartzite, fine-grained mica schist or semi-schist, green slate and phyllite and sparse granule quartzite and graywacke layers

Op Phyllite (Ordovician)--Mostly gray-to-green phyllite with lesser amounts of metasiltstone

Opm Mylonitic rocks (Opm); composed of semischist or phyllite with elongate granules of quartz; interpreted as highly tectonized parts of the phyllite unit (Op). Alternatively, mylonitic rocks (Opm) may be part of a separate, older terrane.

Exotic terranes

Salem Church allochthon

CZh Holly Corner Gneiss (Cambrian? or Late Proterozoic)--A characterizing lithology of the Salem Church allochthon. The Holly Corner is dark-gray to black, fine- to medium-grained, well-foliated hornblende- and biotite-rich gneiss. Compositional layering is rare and where present generally consists of thin pyroxene-bearing calcsilicate layers. Typically the Holly Corner is an amphibole gneiss containing varying amounts of biotite. Locally, biotite may be the dominant dark mineral. Thin discontinuous lenses of impure quartzite (Oqq) locally occur along the contact between the Holly Corner Gneiss of the Salem Church allochthon and the Quantico Formation and are provisionally included with the Holly Corner Gneiss terrane. They are interpreted as lenses of basal Quantico Formation deposited on the top of the Holly Corner Gneiss

Po River terrane

(Matta nappe)

PzPp Po River Metamorphic Suite (lower Paleozoic and (or) Late Proterozoic)--Biotite gneiss and lesser amounts of schist comprise the Matta allochthon. Characteristically the gneiss is a dark-colored, layered, and foliated rock; micaceous materials are concentrated in the dark layers and quartz and feldspar in the light layers. However, all gradations in the relative proportions of mica, quartz, and feldspar are found in the various layers that constitute the gneiss. Feldspar occurs both as a groundmass constituent and very commonly in large augen-shaped grains. Hornblende-bearing gneiss is also present in the Po River Metamorphic Suite but in subordinate amounts as compared with the biotite gneiss. It resembles the biotite gneiss in color and texture but contains varying amounts of hornblende, as well as biotite.

Numerous foliated gneissic granitoid rocks, including pegmatoids, are found as tabular bodies, as well as nontabular masses, in the Po River Metamorphic Suite. The tabular granitoid and pegmatoid bodies form concordant, sill-like layers. They range from less than 2.5 cm wide to as much as about 7.6 m wide. Locally, thinner granitoid layers about 0.5-1.0 cm wide are conformable with the foliation in the gneiss

Intrusive rocks

Cfi Falmouth Intrusive Suite (Carboniferous)--Fine-grained monzogranite and pegmatitic granite, fine-grained granodiorite, and less common tonalite

Sfr Falls Run Granite Gneiss (Silurian)--A pale-pink to nearly white, coarse-grained, strongly foliated hornblende and biotite granitic gneiss ranging in composition from monzonite to granite

SOg Muscovite-biotite granite (Silurian or Ordovician)--Dark gray granite with mosaic textured quartz and with abundant microcline and minor sodic plagioclase

Og Metamonzogranite of the Goldvein pluton (Ordovician)--Coarse-to medium-grained, mesocratic, weakly to strongly foliated metamonzogranite. Pink and green altered feldspars color parts of the pluton

OCtj Trondhjemite of the Horsepen Run pluton (Ordovician and(or) Cambrian?)--Allotriomorphic granular, fine-grained rock locally having granophyric texture consisting of intergrown albite and quartz. Blue-green amphibole is locally abundant, and garnet is present at many places

OCpg Plagiogranite tonalite of the Richland Run pluton (Ordovician and(or) Cambrian?)--Plagiogranites and related rocks; normally leucocratic to mesocratic quartz-rich meta-intrusive rocks. Typically plagioclase-rich, having minor or no potasic feldspar. Many of the plagiogranites have undergone cataclasis to varying degrees and locally are protomylonitic to mylonitic. Plagiogranite is locally intruded by mafic dikes.

Cg Amphibole meiagabbro (Cambrian?)--Coarse- to medium-grained melanocratic, massive as well as foliated rock where it intrudes the Chopawamsic Formation (Cc). Cut by numerous mafic dikes (not shown on the map)

PzZd Granodiorite gneiss (lower Paleozoic or Late Proterozoic)--Gray fine- to medium-grained well-foliated and highly lineated, quartz- plagioclase-biotite gneiss containing abundant well-formed accessory epidote and locally, sparse garnet and minor amounts of muscovite. Also locally grades into granodiorite. Dikes of foliated metamonzogranite commonly intrude the gneiss

a: Strike and dip of joints
b: Strike of vertical joint
c: Horizontal joint

Granite and/or pegmatite dikes

a: strike and dip of dike
b: strike and dip of vertical dike

Outcrop visited

Quarry

Aluminosilicate--bearing quartz veins
qk--kyanite-bearing
qkst--kyanite-staurolite bearing

m: mylonite

Residual total magnetic intensity field of the earth in nanoteslas (gammas) International Geomagnetic Reference Field (IGRF) removed. Contins interval is 20 nanoteslas

PIEDMONT GEOLOGY OF THE STAFFORD, STORCK, SALEM CHURCH, AND FREDERICKSBURG QUADRANGLES, STAFFORD, FAUQUIER AND SPOTSYLVANIA COUNTIES, VIRGINIA

BY
LOUIS PAVLIDES

1995