Merguerian, Charles, 1983a, The structural geology of Manhattan Island, New York City (NYC), New York.

A lithically distinct assemblage of massive, nodular sillimanite-rich schist and gneiss and subordinate amphibolite, forms the northern half of Manhattan Island and a faulted outlier at Mount Morris Park. These rocks, similar to Hall's (1968) Manhattan B and C in Westchester County, are in sharp ductile thrust contact with both the Inwood Marble and muscovitic schist + quartzose granofels exposed in central Manhattan.

Thrusting occurred during two progressive stages of syn-metamorphic deformation (D_1, D_2). F_1 folds are inferred from a locally preserved S_1 foliation. At the thrust, blastomylonitic layering, reduction of grain size, ribboned and polygonized quartz, lit-par-lit granitization, and quartz veins parallel the axial planes of F_2 folds. During D_2, a penetrative flattening foliation (S_2) and metamorphic growth of lenses and layers of quartz and sillimanite+quartz+magnetite up to 4 cm thick, formed axial planar to reclined folds (F_2), which deformed the bedrock into a large-scale (~N50°W, 25°SW) recumbent structure. Although the enveloping structural grain of NYC bedrock trends N50°W, the geometry of the map pattern and the geomorphic trend are regulated by S_3, (~N30°E, 75°SE), the axial surface of isoclinal to tight folds overturned to the west. Typically, S_3 varies from a spaced schistosity to a transposition foliation + shearing near F_3 hinges. The F_3 folds and L_3 elongation lineation (SSE to SW @ 25°) mark a period of L-tectonic ductile flow, smearing the previously flattened sillimanite and quartz into parallel, elongate nodules. At least three phases of crenulate to open folds and numerous brittle faults and joints are superimposed on the older ductile fabrics.

The parentage of the nodular sillimanitic rocks is unknown. They may constitute a dislocation within the Manhattan Formation or form an allochthonous sheet structurally above the NYC autocthonous rocks.

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