

STRUCTURAL GEOLOGY AND METAMORPHISM OF THE INWOOD MARBLE, NYC, NY

MERGUERIAN, Charles; and **MERGUERIAN**, J. Mickey, Geology Department, Hofstra University, 141 Gittleson Hall, Hempstead, NY 11549, geocmm@hofstra.edu.

Within and around the type locality in NYC, the Inwood Marble is a tan to gray weathering dolomite- and calcite metacarbonate rock with four major lithotypes – (1) massive white, coarse-textured calcite marble, (2) thick-layered white to gray predominately dolomitic marble with calc-silicate interlayers, (3) thin-layered gray to tan marble with tan to brown schist and calc-silicate rock (4) thick-layered white to gray marble with interlayered gray quartzite and calc-silicate layers and lenses. Fresh samples from shafts and tunnels show mineral-controlled color variation of whitish (sericite ± tremolite), gray to dark gray to bluish (graphite ± pyrite), tan to dark brown to peach (phlogopite ± dravite), and green (chlorite ± diopside). The microscope shows the presence of previously unreported sphene, apatite, clinozoizite, and fluorescent tremolite. The regional foliation in the Inwood ($S_1 \times S_2$) is developed parallel to compositional layering. At Isham Park the $S_1 \times S_2$ foliation trends ~N55°E, 73° SE and forms the eastern limb of an overturned F_3 antiform flanked westward by synforms cored by resistant Manhattan and underlying Walloomsac schists in Inwood Hill Park. Locally, the marble, schist, and calc-silicate unit is internally deformed by F_2 tight- to intrafolial isoclinal folds with associated boudinage and shearing of gray quartzite, calc-silicate rock, and schistose marble blocks over a meter in dimension. Late porphyroblasts of calcite, diopside, tremolite, and plagioclase overgrow the $S_1 \times S_2$ foliation and are typically a few cms in size but tremolite crystals can range up to 12 cm in length. Outcrop-scale folding and warping of the $S_1 \times S_2$ fabric is controlled by SW-plunging F_3 folds and by later open 2m-wavelength SE-plunging F_4 folds (~ 50° plunge) with axial planar slip cleavage (S_4) solution cleavage and joints trending ~ N-S with moderate to steep eastward dips. Consistent with amphibolite facies metamorphism of the adjacent pelitic rocks the Inwood metacarbonates contain tremolite + diopside but no fosterite. The alignment parallel to F_3 hingelines of late tremolite porphyroblasts (commonly pseudomorphic *after* diopside) indicates that the rock mass was retrograded during the D_3 late Taconian (?) event.

To Cite This Abstract: Merguerian, Charles; and Merguerian, J. Mickey, 2012, Structural geology and metamorphism of the Inwood marble, NYC, NY: Geological Society of America Abstracts with Programs, v. 44, no. 2, p. 73.