Structural Implications of Walloomsac and Hartland Rocks of Southern Manhattan Island

Charles Merguerian, Geology Department, 114 Hofstra University, Hempstead, NY 11549,
and,
Cheryl J. Moss, Mueser Rutledge Consulting Engineers, 14 Penn Plaza, New York, NY 10122.

Drill core examined from over two dozen separate locations south of Canal Street in Manhattan over the past three years have been fruitful in extending surface mapping from areas of natural exposures north of 59th Street. Petrographic studies on drill core samples support the interpretation that at least three distinctly different and mappable schistose units constitute the formation formerly known as the Manhattan Schist in the type locality of Manhattan Island. From their structural base upwards, allochthonous schistose rocks are mapped as the Manhattan and Hartland formations. These tectonostratigraphic units are separated from the Fordham-Inwood-Walloomsac autochthonous basement-cover sequence by ductile faults known as the St. Nicholas thrust and Cameron's Line.

Preliminary results indicate that a belt of Walloomsac schistose and calc-silicate rocks appears south of Canal Street in NYC in two separate along strike areas near the World Trade Center site and also reappears across town near the Brooklyn Bridge. The duplication of Walloomsac rocks on either side of southern Manhattan suggests repetition by folding or faulting. In this area of no surface exposure, drill core and other forms of subsurface information indicate that the region is underlain by migmatized, internally sheared units of the Walloomsac, Manhattan, and Hartland formations together with sheared slivers of serpentinite and foliated granitoid rock. Regional structural and tectonic relationships indicate that in NYC Cameron's Line cuts across the Manhattan Schist and places allochthonous eugeosynclinal Hartland rocks in direct contact with autochthonous schistose and calcareous rocks of the Walloomsac formation. Thus, a structural window exposes elements of the basement-cover sequence beneath the Taconian suture zone in the subsurface of southern Manhattan.

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