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MELANGE FORMATION ASSOCIATED WITH THE EMPLACEMENT OF THE TACONIC ALLOCHTHON: AN ANALOGUE FOR ACCRETIONARY PRISM DEVELOPMENT

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Detailed structural analysis of the Medial Ordovician flysch sequence of eastern New York shows a progressive increase in deformation intensity approaching the main Taconic front. This represents the progressive disruption of a synorogenic flysch deposit; from flat-lying strata to highly deformed melange. The Taconic melange is characterized by blocks and discontinuous fold hinges of graywacke and, near the Taconic front, rocks of shelf and slope affinity enclosed within a highly deformed shaly matrix. This matrix is characterized by an irregular, phacoidal cleavage; probably formed in rocks undergoing noncoaxial strains at high strain rates. High shear strains in weaker lithologies have resulted in the rotation of originally near-horizontal hinge lines towards the overthrust direction. Slumping of hard-rock deformed material uplifted along fault scarps locally creates more complex structural patterns. Melange terranes associated with subduction zones world-wide commonly show similar textural elements, in particular, blocks enclosed within a phacoidally cleaved matrix. Structural mapping of the accretionary terrane of the Aleutian Islands by other workers has shown structural elements and fold orientation patterns which are similar to those found within the Taconic melange. Recent models have suggested that the emplacement of the Taconic Allochthon occurred during the attempted eastwards subduction of the North American continental margin in the Medial Ordovician. The structures found within the flysch of eastern New York suggest that overthrusting of the Taconic Allochthon occurred from the east or south-east creating a depositional-deformational environment analogous to that found within the toe of an accretionary prism.