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A THREE-STAGE DEFORMATION INVOLVING ALLOCHTHONOUS NORMANSKILL AND AUTOCHTHONOUS QUASSAIC STRATA (MEDIAL TO LATE ORDOVICIAN), TOWN OF LLOYD, ULSTER COUNTY, NEW YORK

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Strata of the Quassaic Group (late medial to medial late Ordovician) are separated from the Normanskill Group (early medial Ordovician) in the Marlborough Mountains by a continuous, northerly trending, steeply east-dipping reverse fault (Esopus Thrust) of large displacement. Immediately east of the fault the Normanskill comprises a 400+ m thick sequence of post-Austin Glen strata. At the northern end of Illinois Mountain mapping has shown that the fault has a sinistral separation of at least 1300 m along a NE trending transverse fault. On the southeast side of the transverse fault the Esopus thrust has been folded along with Quassaic strata into a steeply north-plunging antiform. This fold is truncated on the east by a thrust which emplaced strata of the Austin Glen Formation (Normanskill Group). Thus, the Esopus Thrust is sinistrally offset, folded, and truncated. Field relations suggest that the sequence of events were: 1) westward thrusting of uppermost Normanskill Group strata against the Quassaic along the Esopus Thrust; 2) sinistral displacement of the Esopus thrust and adjacent strata; 3) westward thrusting of Austin Glen strata over post-Austin Glen Normanskill and Quassaic strata, and the transverse fault. The antiformal folding is most likely associated with the third event.

Although the first event occurred in the Taconian (Hudson River phase) the ages of the subsequent events are either later Taconian, Acadian or Alleghenian. The transverse faulting suggests that a significant component of north-south shortening may have occurred during the second event.