

## **Variation in two styles of Acadian thrust faulting in the Pinnacle Formation, Richmond, VT**

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The goal of this study is to investigate the variation in the styles of Acadian thrust faulting in the Pinnacle Fm. (CZp) located on the western flanks of the Green Mountain anticlinorium. The unit contains foliated to massive muscovite-chlorite-biotite schist and metawacke and phyllite with beds of pebble to cobble conglomerate. It sits unconformably on Proterozoic basement to the south (Ripton area) and is interbedded with Tibbit Hill metavolcanics to the north. A continuous 50 m roadcut, on which this study is based, exhibits two domains defined by distinctive structural relationships.

The eastern domain is comprised of layers of pebble-bearing metawacke and chlorite schist with quartz-calcite veins. The oldest visible foliation is an early penetrative disjunctive pinstripe cleavage ( $S_2$ ) defined by alternating muscovite-chlorite and quartz-feldspar domains that are axial planar to Taconian isoclinal folds. This foliation is deformed by tight asymmetric west-verging upright folds ( $F_3$ ). Cross cutting the crenulation cleavage ( $S_3$ ) are a series of discrete ~1m wide ductile thrust zones defined by the truncation of the pinstripe, an intensification in the amount of stretching of the pebbles, and the transposition of the crenulation cleavage parallel to the thrust surface.

The western domain is composed of muscovite-chlorite schist with fewer metawacke layers. The older pinstripe foliation is not as prevalent here due to intense overprinting associated with the penetrative  $S_3$  crenulation cleavage. Unlike the eastern domain, the thrust zones are parallel to  $S_3$  and have a down dip quartz-chlorite +/- pyrite mineral lineation on the  $S_3$  planes.

The preservation of different styles of thrust development in the two domains results from lithologic variability and the effects of pre-existing planes of weakness. The eastern type formed by shearing along the long limbs of asymmetric  $F_3$  folds of  $S_2$  while the western type formed by shearing parallel to the  $S_3$  cleavage planes.