

Syn-Acadian Emplacement Model for the South Mountain Batholith, Meguma Terrane, Nova Scotia: Magnetic Fabric and Structural Analyses¹

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The anisotropy of magnetic susceptibility and the structural geology of the Late Devonian South Mountain Batholith (Meguma Terrane, Nova Scotia) are used to characterize its emplacement and structural evolution. The South Mountain Batholith is the largest peraluminous granitoid complex within the Appalachian orogen. It is a composite batholith made up of stage 1 granodiorites and monzogranites and stage 2 leucomonzogranites and leucogranites. The anisotropy of magnetic susceptibility was used to map the biotite petrofabric at the scale of the batholith. The biotite fabric pattern is similar to the pattern of folding and shearing of the feldspar megacryst foliation, documented at the outcrop scale. In stage 1 plutons, the magnetic foliation is deformed into a girdle about the horizontal, northeast-southwest-trending

magnetic lineation, which is parallel to regional fold axes and extension lineations in the country rocks. In the stage 2 plutons, a horizontal northeast-southwest- to east-west-trending magnetic lineation is also present, but the horizontal orientation of the magnetic foliation is widely preserved. The folding and shearing of the foliations and the horizontal northeast-southwest-trending lineation that is pervasive throughout the South Mountain Batholith are interpreted to record Acadian tectonic deformation of the plutons as they crystallized. Acadian deformation continued during the latest stages of crystallization, resulting in the localization of mineral deposits and greisens along shear zones, faults, and joints. A model is presented for the syntectonic emplacement of the South Mountain batholith as a laccolithic complex.

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