
**Magma mingling in the Avalonian Holyrood Granite,
Newfoundland**

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Detailed mapping and sample analysis has been carried out on an outcrop of the ca. 620 Ma Holyrood Granite where spectacular magma mingling features are displayed. The ~50 × 10 m² outcrop is located on the coast on the east side of Conception Bay, the Avalon Peninsula, Newfoundland, just outside the town of Holyrood. The outcrop corresponds to the upper levels of a granitic magma chamber, as evidenced by sporadic columns of pegmatite, and the main features of interest to this study relate to the intrusion of a more mafic magma into the chamber. Most occurrences of the second, more mafic rock type are in the form of metre-scale, rounded blobs, many of which have been preferentially eroded, but there are also occasional dykes. Though earlier assumed to be basaltic, closer examination of the second rock type proves it to be intermediate in composition, and contacts which appear sharp in the field contain intergrown crystals. No chilled margins were observed and we suspect that the second magma was a crystal-bearing slurry when intruded. The surrounding granite must also have been mushy at the time. A changing rheology with either time or depth in the

chamber is observed across the outcrop. At its northern end, contacts between host and blobs are smooth and unbroken, whereas at the southern end blobs have arcuate spalled rims, where the surrounding granite cracked and the more mafic magma intruded into the cracks. Throughout the outcrop there are faults which cut across blobs, apparently in the later stages of solidification.