

MANTLE AND CRUSTAL XENOLITHS FROM THE NORTH
HARTLAND DIKE, VERMONT

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At North Hartland, Vermont, a faulted northeast-trending camptonite dike, K-Ar age of 133 +/- 6 Ma, contains abundant inclusions unlike surrounding country rocks. The majority of the xenoliths are well-rounded and unaltered ultramafic types, including dunite, clinopyroxenite, and spinel-bearing lherzolite and harzburgite. Electron microprobe analyses indicate that enstatite, diopside, low-Ti augite, olivine (Fo 90), brown chromian pleonaste, and rare phlogopite are the ultramafic phases. Quartz plagioclase granulites are also common.

The ultramafic types are similar to mantle xenoliths in lamprophyre dikes near Westerly, Rhode Island and Cambridge, Massachusetts. The ultramafic assemblage may indicate depths of origin greater than the base of the crust (30 - 40 km) but probably less than depths where garnet becomes stable (roughly 55 km). Aside from demonstrating a mantle origin for camptonite, the xenolith suite documents the rock types present near the mantle-crustal interface in central New England.