

Provenance Implications of Cenozoic Basalt in East Antarctica

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Mt. Howe is a nunatak at the head of the Scott Glacier in East Antarctica and features multiple moraines that include rocks from unmapped regions in the interior of Antarctica. To understand the evolution of the West Antarctic Ice Sheet (WAIS) it is important to be able to determine the contributions of material from East Antarctica and West Antarctica. Determining the geology of the Scott Glacier area is an important step in differentiating these materials. The local geology of Mt. Howe was described in detail by Doumani and Minshew (1965), as intercalated sandstone, siltstone, and shale units with large diabase sill intrusions, collectively part of the Mesozoic Beacon Supergroup. However, rock samples obtained from a Mt. Howe moraine by an IUPUI field party in 2007 include igneous rocks such as granite and vesicular basalt. The purpose of this study was to determine the age and chemical composition of several basalts obtained from glacial till from Mt. Howe and downstream at Karo Hills. The basalts collected from these two sites could be Jurassic in age or they could be from Cenozoic volcanic activity similar to that of nearby Sheridan Bluff, where olivine basalts described by Stump et al. (1980) have K-Ar ages of 19.43 ± 0.65 Ma. The hypothesis based on hand specimen appearance is that MH-35 will match the Cenozoic volcanics found at Sheridan Bluff and that other basalt samples (MH-18, KH-1) will be similar to Jurassic dolerites and basalts. If any of these basalts are Cenozoic, they would represent the most interior Cenozoic volcanic rocks ever recorded in Antarctica.

Geochemical analyses were obtained at XRF Laboratory at Michigan State University using a Bruker S4 Pioneer WDXRF. KH1 was classified as basalt and MH18 was classified as basaltic andesite. Geochemical data for MH35 was omitted due to low totals. To determine the age of these basalts, Ar/Ar dating will be carried out at New Mexico Tech. Interestingly U/Pb analyses of detrital zircons of Mt. Howe till revealed 3 Cenozoic age grains (19.4 ± 0.9 , 23.1 ± 0.05 , 25 ± 0.09 Ma) similar to the age of basalts observed downstream at Sheridan Bluff (Stump et al., 1980), however, no such ages were obtained from West Antarctic subglacial tills.

References Cited

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