Eycott Volcanic Group, Caradoc magmatism, Ordovician, Northern England


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Eycott Volcanic Group

Geological map showing the principal Ordovician and Devonian igneous bodies and their relationship to major structural features. BrO Broad Oak Granodiorite Pluton, Butt Buttermere Intrusion, CF Carrock Fell Centre, CW Crummock Water Granite, Dun Dunmail Intrusion, En Ennerdale Granite Pluton, Esk Eskdale Granite Pluton, Ha Haweswater Gabbro-Microdiorite Swarm, HG Haweswater intrusion, LG Loweswater Intrusion, Ryd Rydal Intrusion, Sh Shap Granite Pluton, Sk
Inliers of the Eycott Volcanic Group occur along the northern margin of the Lake District and also near Melmerby in the north of the Cross Fell Inlier. The aeromagnetic anomaly associated with these rocks links the inliers beneath the cover of Carboniferous rocks to form a continuous, arcuate belt truncated to the south by the Causey Pike Fault (P916043).

Tabular basaltic andesite and andesite sheets, along with subordinate basalt and dacite, comprise the lower part, up to 2400 m thick. The sheets are generally considered to be lava flows, though some are probably sills. The rocks typically contain phenocrysts of plagioclase with subordinate orthopyroxene and clinopyroxene and, in a few rocks, olivine. Some of the basaltic andesite sheets are notable in containing up to 45 per cent plagioclase phenocrysts up to 30 mm across. This striking, ornamental rock has been referred to as ‘Eycott-type’ basaltic andesite. The lavas are interbedded with thin units of tuff, lapilli-tuff, pyroclastic breccia and volcaniclastic sedimentary rocks.

At the base of the group, the Overwater Formation consists of up to about 8 m of bedded grey siltstone and greenish grey tuffaceous sandstone, intruded locally by sills. The uppermost 800 m of the group (Potts Ghyll Formation) is best developed in the Caldbeck Fells, where it consists of heterogeneous, vitric acid andesitic tuff, overlain by pumice- and lithic-rich lapilli-tuff that is ungraded and very poorly sorted. The Potts Ghyll Formation is interpreted as non-welded ignimbrite.

Facies present in the volcaniclastic rocks suggest that a subaerial environment dominated. With the exception of the thick unit of pyroclastic rocks preserved at the top of the group, the Eycott volcanic rocks closely resemble the Birker Fell Formation of the Borrowdale Volcanic Group and probably developed in a similar manner. Thickening of parts of the succession across major faults indicates that extensional faulting played an important role in accumulation of this sequence.

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