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## 29 Mosedale

**Theme:** Earthquakes and folded rocks

### Location

29 Mosedale—Upper Caldew valley — Granite and folded metamorphosed rocks. Drive up the valley from Mosedale hamlet. There is parking beside the road [NY 327 327].

### Description

There are a few Mosedales in Cumbria, perhaps not surprising as it means 'bog in a valley'. This one in the northern fells is the source of the River Caldew.

Mosedale is a beautiful, glaciated valley with a typical 'U' shape. For the most part it cuts through 470-million-year-old crushed, bent and broken Ordovician mudstones and siltstones. But glaciers and then the river have cut down deep enough to reveal something else beneath: a younger granite plus evidence of how this granite 'baked' the rocks around it. The Skiddaw Granite doesn't show a lot of itself at surface, but the intense heat from when it was molten, around 405 million years ago, completely transformed the older mudstones and siltstones around it. The alteration caused by the baking has a concentric pattern. The zone closest to the granite is a hard slate filled with garnets, while further out there are crystals and spots of other minerals (chiastolite) on the slate surface. This process of change through heat (and/or pressure) is called metamorphism and the concentric zones are called a metamorphic aureole.

The Skiddaw Granite that brought the heat is quite different to the slaty rocks around it. It is made of interlocking crystals of black mica, white feldspar and opaque quartz that solidified in a chamber of molten rock around eight kilometres below the surface. The granite changes the further north you go; as the magma cooled, hot fluids altered its minerals so that it became a rock called greisen. These hot fluids were mineral-rich; one reason why the rare and valuable metal tungsten was once mined in the valley.

### Photographs

(Photo 29-1) 29 Skiddaw Granite altered to greisen in the bed of the River Caldew.

(Photo 29-2) 29 Mosedale.



*(Photo 29-1) Skiddaw Granite altered to greisen in the bed of the River Caldew.*



*(Photo 29-2) Mosedale.*