

# Glasgow Geological Society day excursion to Ballachulish and Glencoe.

Leader:- Ben Harte

Saturday 14<sup>th</sup> May  
Report by- R J Diamond  
21 people present

Our first stop was at **Rubh' AirdDaraich** on the north shore of Loch Leven, in order to look south, and get an overview of the Ballachulish Igneous Complex. This granitic complex had been intruded into the existing metamorphosed Dalradian rocks about 400 – 425 Ma



Photo R. McLean

Before examining the different outcrops along the shore we noticed two features indicating the activity of ice. Firstly there were examples of rochemoutonees which had been left by the ice. Then further along we saw evidence of stria on some of the rocks, indicating the direction of ice flow

We then went on to examine the Leven schists, and the Ballachulish slates, which are separated by the Ballachulish Slide. The Ballachulish Slide is believed to be a splay of the Great Glen fault complex, and is a thrust slide, which occurred at the same time as the folding events.

The reasons for the differences in metamorphic grade between the two formations had been the focus of an intense debate between E.B.Bailey, and Elles& Tilley, only recently resolved in favour of Baileys original position. Details of this controversy can be found in '*The Ballachulish Igneous Complex and Aureole: a field guide by David Pattison and Ben Harte*' (Edinburgh Geological Society, 2001).



The Leven Schists are a series of metamorphosed shales containing garnets, biotite, some muscovite, and chlorite .This 'garnet grade' metamorphism is typical of the Regional Metamorphism, which indicates that the original rocks reached a temperature of c450 C and a depth of 15km. There is strong schistosity and folding, in places showing knappe like structures, due to the compressive forces that the rocks have undergone.

In contrast the Ballachulish slate had no biotite or garnets in it, indicating a lower grade of metamorphism  
One final outcrop of note at this site showed a metamorphosed calcareous mud, indicative of a marine depositional environment.

Our second stop at the South end of **Ballachulish Bridge** we looked at the margin of the Igneous Complex.

The rocks were a microdiorite containing pyroxene, K feldspar, plagioclase feldspar and hornblende. It was very fine grained, and contained xenoliths. Details can be found in the 'Guide'



Photo M. Cummings



At our third stop at the pier by Holly Tree restaurant we further examined the metamorphism around the complex. At this location there was evidence of secondary metamorphism. The rocks had both been exposed to temperatures of c750C indicated by the presence of kantalinite (olivine, K feldspar, pyroxene hornblende and biotite mica) There was cordierite in some of the veins, indicating in situ melting and injection from the granite margin. The chlorite had been changed to cordierite and the muscovite to biotite. There were also metamorphosed limey muds and sandstones. The different strata had various colours depending on the minerals present. Diopside gave the rock an 'apple green' colour, epidote a yellow green colour, and Ca garnets a greeny purple colour.

Photo M. Cummings

Finally we visited **AlltCoirenamBeithach** to examine the unconformity of the volcanic rocks overlying the Leven Schists within the Glencoe cauldron subsidence.



Photo R. McLean



There has been c1km of subsidence over the 400Ma, and this exposure is a place where the structure of the cauldron has been revealed by subsequent erosion. The lavas are either andesites, which appear as diorites, or rhyolites, which appear as granites.



Photo R. McLean

By the river there is evidence for the original contact surface between the Leven Schists and the lavas.

After this strenuous but very informative day, we all returned safely to Glasgow

