
FIELD TRIP TO THE NORTH OF SCOTLAND

John Willmouth

In the summer of 1997, Dave Green took a party of A level students from the Sir Thomas Rich School in Gloucester, plus a number of us "senior" students doing private advanced geology courses with him, up to the north of Scotland. For those not aware, these are cheap trips staying in Youth Hostels and doing our own catering - a great leveller and thoroughly enjoyable.

the Navy - now with a shower, and notice stating that it had been donated by the Earth Science Department of Durham University. Clearly they were a bit fed up with living in a state of continual "ponginess".

Durness is, of course, famous for Smoo Cave, the limestone cavern into the cliffs with several "blow holes" round Durness. I feel that the words of Matthew Hendle (1882) describe it far better than I could:-

"The light which slumbers within that dome, once seen, is felt. The light - what they have of it - of all caves is fine; that of this is surpassingly lovely. Poets would call it a chastened light. If by that, is meant that it resembles a character which, through the buffetings and disappointments of the world, shines with softened sweetness, we partly understand the application; and it would be a fitting one."

(p 55 of The Hidden Landscape by Richard Fortey)

The weather was excellent throughout, and the inlet of the Kyle of Durness was utterly and unbelievably beautiful; green vegetation on the cliffs, deep blue green water and golden sands. I have shown photos, and people refuse to believe that this was within 10 miles or so of Cape Wrath. The Kyle of Durness cuts Cape Wrath off from Durness. A "ferry" can take about six people at a time. (We were told that the ferryman can't swim - after we had crossed). There is a metalled road on the other side, and a minibus takes sightseers up the lighthouse. However we were only going halfway, so we "tabbed".

The A level students mapped the area, which was in fact the Laurentian Foreland. It consisted of Lewisian, Torridonian and Cambro-Ordovician, all within a very small area.

After a 5 mile walk each way, my feet felt in need of "refreshment". I attempted to dip them in the Kyle and realised why a ferry was so necessary!

Location map showing the distribution of outcrop of the Cambro-Ordovician rocks along the Moine Thrust Zone

We had an overnight stop at Leadhills, not arriving there until 11 p.m. and departing by 7 the following morning. No time for mineral hunting! We arrived at Durness late the following afternoon. If you have never been there, find a photograph of the Falkland Islands and you have a similar vista. The Youth Hostel was a series of wooden huts "abandoned" by

Just a few miles south of Durness are the Scourie Dykes at Poll'eorma, (NC 148456). Once over the headland these are very easily approached and inspected. Obviously this area is mostly the PreCambrian basement rocks, and bits of the Moine Thrust Zone exposure can be seen at various points particularly to the southern end of Loch Eriboll. To look closely, some moderate walking and climbing is involved. However some of the "horses" and "duplexes" are best seen from afar.

There is a fairly stern uphill traverse to Laxford Lock from NC190480 north east to southwest. It starts with basic igneous rocks, dated to 2900 Ma. They are now amphibolites. The rocks then become schists, some with raised veins, and then on to the Laxfordian rocks with pink banding. Towards the top there is a change from high grade amphibolic gneiss to a lower grade. For all that, and the toughness of the walk, the view from the top is nothing short of breathtakingly spectacular.

Coldbackie (NC 606604) is well worth a visit. This is now east of the Moine Thrust and into the Moine Nappe complex. The west side of the beach is comprised of rocks originally metamorphosed between 1200 - 1000 Ma and re-metamorphosed during the Caledonian orogeny (Ordovician/Silurian). These were originally laid down on the edge of continents over the Lewisian Basement.

At the eastern end of the beach the lowest visible bedding is a very convoluted schist overlaid with a conglomerate, very poorly sorted and roughly a 50/50 clast/matrix supported. At the beach level it seemed to have a thickness of a maximum of 50' by perhaps 200 yards wide. On returning to the road it became apparent that hills rising to 300-400 feet behind and covering a much wider area were composed of the same conglomerate. This must have been a massive catastrophic event.

Even the road cutting, where we parked, afforded interest - comprising fold mullions or rodding. This feature is fully described on pages 214/215 of *"The Macmillan Guide to Geological Structures"* by John L. Roberts.

For the second part of the trip we moved over to Helmesdale on the east. These facies are as different as chalk and cheese from what had

been seen.

One stop on the way was to visit the cove of Port Mor Armadale, (NC774652). Don't attempt this unless you happen to be 110% fit and have nerves of steel! A gentle stroll down a "path" of bog, stream, loose rocks, a variety of muds etc. brings you to a ten foot drop to a small beach. It seems even steeper coming back up!

The beach is of pebbles to massive slabs fallen from the cliffs towering each side to perhaps 300'. This is part of a major fault line, (*see diagram next page*). The host rock is a dark schist with pegmatites, indicating a high grade of metamorphism with granite "invaders" throughout; a wonderful example of the Moine migmatites. There were beautifully folded rocks scattered everywhere, many garnetiferous. They remain in place since they would have been impossible to carry out of this "punch bowl".

At Lothbeg Point (NC962096) are rocks of Upper Jurassic age. These are the equivalent to the Kimmeridge Clay of the South of England. They are fossiliferous and contain an unusual combination of ammonites and plant debris, which gave rise to the postulation of the Helmesdale Fault being a continental edge. These Upper Jurassic rocks continue along to the Doll shore line, (NC890024) where they are part of the Brora Arenaceous formation. They outcrop on the beach as sandstone, which is sub-rounded, super-mature, and poorly cemented, therefore subject to extensive sea erosion. The pebbles on the beach are poorly sorted, immature, angular to sub-angular and completely unconsolidated.

A morning was spent panning for gold in the hills above Helmesdale. Prior to going, Dave Breakwell had given me some 20 minutes tuition on panning, making me the "expert" of the group. Everyone found at least one flake of gold. Like the Olympic Games, it is the taking part - not the winning. The story goes, that during the Australian gold rush, a local from Helmesdale sold everything went out there, and, like so many others, found nothing. It took him many years to save enough to get back to his native Scotland. In his old age, returning home after an evening in the pub he stopped and leaned over the bridge, looking at the water and reflecting on his life. He saw

something glint in the stream. He had found gold on his own "doorstep". A nice story, but in some doubt, as by the time the stream gets to Helmesdale, it is deep and full of silt. To pan for the gold means going inland about 12 miles, and that is how far it is to the nearest pub. You certainly need to be thirsty to walk that far! The Laird used to charge 1/- for a gold prospecting licence. Then a beloved Chancellor of the Exchequer (who shall remain unnamed) decided that VAT was payable, to which (I am reliable informed) the Laird said the Scottish equivalent of "On yer bike" Now there is simply a book to sign and no charge.

A visit to Achanarras Quarry, Nr Harpsdale (approx. NC130560) proved very worthwhile. This comprises the Caithness Flags, and everyone found at least one fossil fish - except me.

The abandoned quarry at ND092202 was an ideal site for the A level students to compile a graphic log. There are some beautiful flame structures here as well as ripples and cross bedding. All in all it was (correctly) concluded

that this was part of a flood plain.

By chance, stopping for lunch on the return journey, just south of Amulree and some 200 yards off the A822, (approx. NN910300) we came across some wonderful examples of slip-strain folding. This was part of the Dalradian sequence and was of an unusual calc-silicate schist with a little mica.

We arrived back at Leadhills around 6 p.m. leaving just over two hours of decent daylight for mineral hunting. So many different minerals were found it would be impossible to list them, but Leadhillite was found. In fact, I got up at 5 a.m. the following morning and went off for a further couple of hours. What I found definitely made me think about planning a future trip just to this area.

This year Dave Green is planning a trip to Connemara at Easter, and Northern Spain in the autumn. There is also the possibility of a trip to Iceland at some point in the future. He can be contacted on 01594 860858.