ROAMING THE SCOTTISH HIGHLANDS

JUNE 19–23, 2007

From left to right: Darrell Henry, Barb Dutrow, Ian Parsons, Pierrette Tremblay, and Liz Catlos. PHOTO T.A. CLARK

Just Ask!

It all started with Barb Dutrow strolling into Ian Parsons' office while visiting the University of Edinburgh several months ago and mentioning how nice a field trip to the metamorphic rocks of the Scottish Highlands would be, seeing there would be all these metamorphic petrologists coming to the Frontiers meeting. And would Ian be willing to organize such a field trip? Ian obliged, invitations were sent, and soon we had a small group committed to the trip. Ian did a tremendous job of pre-trip organization, and we all arrived prepared with necessary rain gear and midge-repellent oil. Although we expected an informal field trip, Ian had prepared a complete folder full of maps, hand outs, and classic articles for each of us.

On Our Way

We converged on Edinburgh on June 19, and after anxious moments about missing suitcases, we were on our way to our base of operations, the Inchnadamph Hotel, about 23 miles north of Ullapool and 200 miles north of Edinburgh. The Inchnadamph Hotel has a long connection with geologists. The great Geological Survey map-makers Ben Peach and John Horne stayed there more than a century ago, while they made their ground-breaking map of the Moine Thrust Zone in the Assynt region. They showed how the metamorphic rocks of the Moine series had been carried westward over unmetamorphosed Cambro-Ordovician and Neoproterozoic sedimentary rocks resting unconformably on the "fundamental gneiss" (the Lewisian Gneiss), whose protoliths, we now know, are more than three billion years old. They recognized several planes of thrust movement and showed that the sedimentary succession was repeated many times by imbrication. As it happens, 2007 is the centenary of the publication of their great "North-west Highlands Memoir." There is a memorial to these famous geologists on a hillock overlooking Loch Assynt, near the hotel.

We were not the only geologists there. The lodge next door, the Assynt Field Centre, was occupied by students doing field school. We repeatedly saw their vans and students engaged in mapping exercises. No wonder, when you have such splendid geology out your back door.

Day 1

Under typical Scottish weather (55°F and rainy), we set out for a south to north traverse through the Assynt region. At Knockan Crag, our first stop, a visitor center and nature trails eloquently explain the incredible geology. After marvelling at the center's perceptive geological interpretation aided by cartoons and a "machine" to produce thrust faults, we walked up the trail through an entire Cambrian section overlain by the Moine schists. The contact marks the Moine Thrust, and you can place your hand over 500 million years of time (with the oldest on top). We then crossed Assynt, moving downwards through the Cambrian, the red sandstones of the Neoproterozoic Torridonian and ending in the Lewisian at Clachtoll, where the ladies of the party lounged on a white beach beside a turquoise sea (without, however, removing their rain gear!).

Barb Dutrow bridging 500 million years. PHOTO D. HENRY

Day 2 – An Earth-Moving View

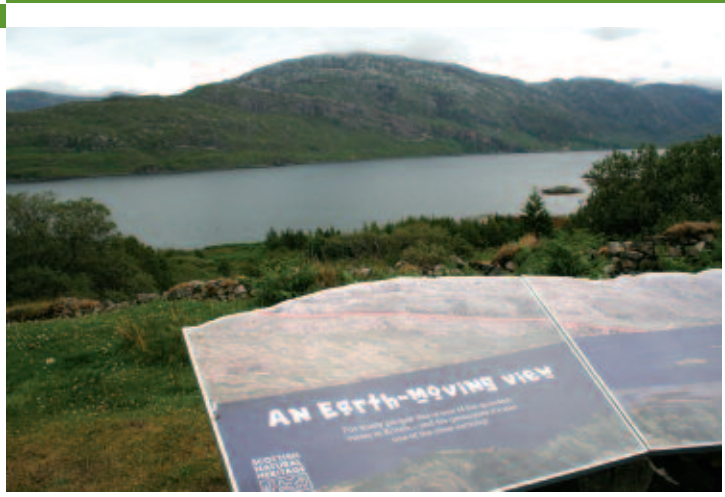
Our first stop provided us with a panoramic view of the Moine Thrust Zone across Loch Glencoul and a roadside interpretation panel that explained to the public what they could see. We were impressed. We moved northward into the hummocky, typically rocky country, studded by small lochs, which is characteristic of the Lewisian Gneiss.

Near Scouriemore we hiked to see spectacular mafic granulite facies garnet gneisses, with ~2500 Ma metamorphic ages, cut by a pink pegmatite with meter-scale feldspars. The sun was shining, the sea was brilliant. Continuing north to Laxford Bridge we crossed the Laxford front, a possible terrane boundary, and entered the lower-grade Laxfordian gneisses, with metamorphic ages around 1700 Ma, characterized by numerous granite veins and deformed "Scourie dykes." At our last stop, there was yet another interpretation panel, this one entitled "The multicolored rock stop."

Day 3 – Grand Geotour

After a brief stop at Oykell Bridge to see Moine schists with mullion structure, we drove north across bleak and open country to examine the Bettyhill migmatites and augen gneiss. At the height of the granite controversy, these migmatites were thought to provide evidence of metasomatic conversion. After a diversion to visit the Ben Loyal syenite we

There were numerous stops to photograph the scenery – here is a view of Suilven. PHOTO D. HENRY



The Sole Thrust across Loch Glencoul. PHOTO D. HENRY

headed west to Durness, the most northwesterly village in Scotland, to visit the beautiful sea cave of Smoo in the Cambrian Durness Limestone. Our final stop was at Balkaniel Bay, looking out to Cape Wrath, where a detached outlier of Moine schist rests on limestones west of the Moine Thrust Zone. After a long, 250-mile day, we ended up at a Michelin one-star pub, at Kylesku, more-or-less in the middle of nowhere. To our amazement, the geological map of Assynt was used to decorate the dining area. Where else in the world do you find geologic maps as art in Michelin-star restaurants?

Day 4 – Exotic Igneous Rocks

We started by visiting some of Britain's most exotic igneous rocks—nepheline syenites in the late-Caledonian (430 Ma) Loch Borralan igneous complex. In the early part of the last century these rocks were a pillar of the Daly-Shand hypothesis, that nepheline-bearing rocks formed by desilication reactions between carbonate rocks and normal, silica-saturated magmas. Two of its rock names, ledmoreite and borolanite, are still sometimes used. Remarkably, in such a heavily "geologized" region, a carbonatite unit, which we visited, was discovered only in 1988. The day was notable for its alternation of periods of rain with swarms of midges and ended with a tour of the Stac Pollaidh nature reserve.

We extend our sincere thanks to Ian Parsons, who so generously donated his time to prepare and lead this trip. We had a fabulous time: breathtaking scenery, great geology, rays of sun every day. It was a perfect mixture of looking at rocks, admiring the scenery, playing tourist,

Some of the interpretation panels we saw. PHOTOS D. HENRY AND B. DUTROW

and enjoying good food and good company. We were very impressed by the public outreach and appreciation for geology, as demonstrated by the interpretive panels mainly developed by the Scottish government conservation organization, Scottish Natural Heritage.

Pierrette Tremblay, Darrell Henry, Barb Dutrow, and **Liz Catlos**
(with help from Ian Parsons)

NOTE FROM THE EDITORS

You have participated in an interesting field trip or carried out field work in an exotic location? Consider submitting an account of it for Travelogue.

ADVERTISERS IN THIS ISSUE

JOB POSTINGS

See also www.elementsmagazine.org/jobpostings