

Geological Mapping of the Island of Kerrera

Not many people choose to spend September on a remote Scottish island, but for a geologist it is one of the best places to go, and I am very lucky to have been able to spend the end of the Long Vacation on the island of Kerrera.



Island of Kerrera marked by red point.

The geological paradise of Kerrera is situated just off the coast of Oban. It has a permanent population of 45 people, as well as hundreds of sheep, Highland cows, wild goats, and sea otters. One of the things that I got to experience was the remote way of life - there are two ferry routes connecting Kerrera to Oban, but the journey to the nearest supermarket takes nearly two hours. However, with only locals allowed cars, this relative isolation meant that the island was quiet and unpolluted, with large areas unaffected by human activity.

Getting to Oban itself is not a challenge at all and in fact is probably one of the most beautiful journeys I have ever been on. On my way to Oban, I took the bus from Inverness

and travelled past Loch Ness (and along the Great Glen Fault!), whilst on my way back I took the train to Glasgow, going through Loch Lomond National Park. Both of these journeys took me past some amazing Scottish scenery, with lots of lochs, woodland, and mountains.

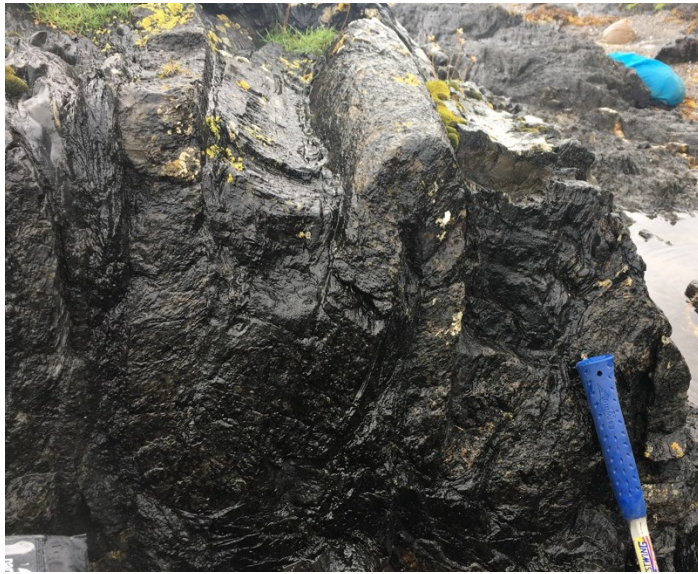
With so few people on the island, it was nice to have the company of my friend, who is also studying Earth Sciences but at Oxford. We stayed in a chalet on the eastern coast of the island. This was very conveniently positioned so that the walk to any part of the island did not take too long. Although, as it was on the main tourist track, on one occasion our breakfast was interrupted by visitors at the front door, who had clearly confused us for the Tearoom and were expecting tea and cake.



View from the chalet onto Little Horseshoe Bay and the mainland.

Visiting the Tearoom was one of the highlights of the trip, partially because it provided shelter from the consistently reliable (reliably rainy) Western Highland weather. The promise of tea, cake, and homemade soups provided constant temptation, making simply walking past quite difficult. But there was work to be done!

The main purpose of my visit was to produce a geological map of the island and to collect data to write a report, which constitutes 25% of my degree. Having heard about the geology from other members of the Earth Sciences Department, and a Girton alumna, who had visited a few years ago for the same reason, I also found that the geology on Kerrera provides lots of variety and plenty to write and think about.



Slate with some folds (hammer for scale).

The oldest unit that I found was some very tightly folded slate, which is around 700 million years old and in places contains crystals of 'fool's gold'. From my field observations, I suspect that the textures inside this slate record some important events in the geological history of the UK, such as the collision of England and Scotland, known as the Caledonian Orogeny.

After the slate was deposited and deformed, there is then a 300- million- year gap, which there is no record of on the island. This creates an unconformable surface and means that the metamorphic rocks are overlain by a succession of sedimentary units. The sedimentary units on the island are part of the Old Red Sandstone sequence, deposited in rivers and lakes approximately 400 million years ago during the Devonian period. I was quite excited to see those as had read that people have found fish fossils in them, but the best potential fossil that I got was a dubious algal mat - nowhere near as glamorous in the



Taking measurements or a nap? Old Red Sandstone

palaeontological world as fish! More than half of the island consisted of these rocks and I spent a lot of time taking measurements and looking at the structures within it.



Basalt with columnar jointing

I also found some igneous rocks on the island. These were mainly basalts, some with columnar jointing which resembled a mini Giant's Causeway. These were erupted from volcanoes above the subduction zone formed during the closure of the Iapetus Ocean, also approximately 400 million years ago. A similar setting today is in Japan where the Pacific Plate is being subducted under the Okhotsk Plate. The youngest

rocks that I saw were some dykes, which are part of the igneous

complex found on the neighbouring Isle of Mull. These were intruded approximately 60 million years ago during the opening of the Atlantic Ocean and are found orientated in the same direction all across Scotland. A particularly interesting dyke is one in the south of the island which is called Devil's Dyke. It is almost a perfect triangle and is at least 6 metres high and 10 metres long. My mapping partner and I never figured out why it was called this, but it did look quite unusual.

As my days in the field were quite long, and on my days off I had to go into Oban to buy food, I tried to see most of the historic and other interesting sites on Kerrera during the actual mapping. One of the most popular tourist spots is the 16th Century Gylen Castle. It was even reportedly visited by the painter William Turner who sketched it from every possible angle (I also ended up including it in a lot of my field sketches, as it is a useful reference point, but Turner probably did it slightly better). A particularly memorable



Looking south east onto Gylen Castle

experience was when on the first day out in the field I sheltered inside to have lunch. Interestingly, as the castle was built out of local rocks, it also provided quite a good overview of the geology that I spent the next month mapping.

In general, being surrounded by nature and the diverse wildlife, and chatting to the friendly locals made this one of the best holidays, and I am incredibly grateful to have received the Girton College Travel Award to support this adventure.