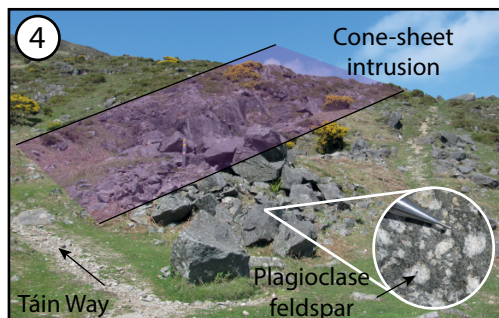


Self-guided geology: Carlingford to Slieve Foye



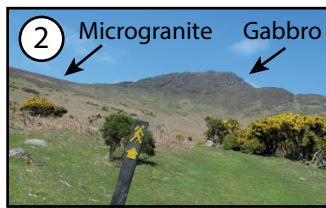
A fine grained sedimentary rock called siltstone forms the cliffs in the layby NW of King John's Castle. These rocks were deposited on the floor of an ancient ocean over 400 million years ago. When plate tectonics later closed the ocean, these sediments were folded. Some 60 million years ago the region began to rift apart to form the Atlantic Ocean. Large explosive volcanoes formed at Carlingford and Gullion but are long since eroded. The first evidence of volcanic activity you will see are the dark, fine-grained basalt sheets that crosscut the folded siltstones here. These are volcanic intrusions called "cone-sheets" that originated from a magma chamber about 1 km below your feet.



A cone-sheet can be traced along the side of the Slate Rock, across the path and along the slope to the north. This sheet is packed with white crystals of plagioclase feldspar. The crystals grew in a magma chamber inside the Carlingford volcano and were carried here by a liquid basaltic magma. This sheet is thicker than the examples at the shore, reaching 8 m.

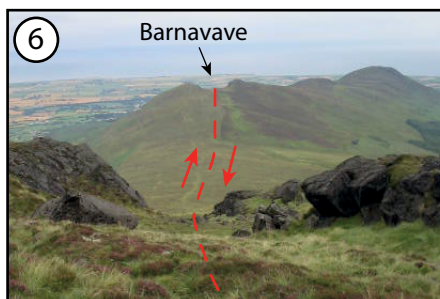
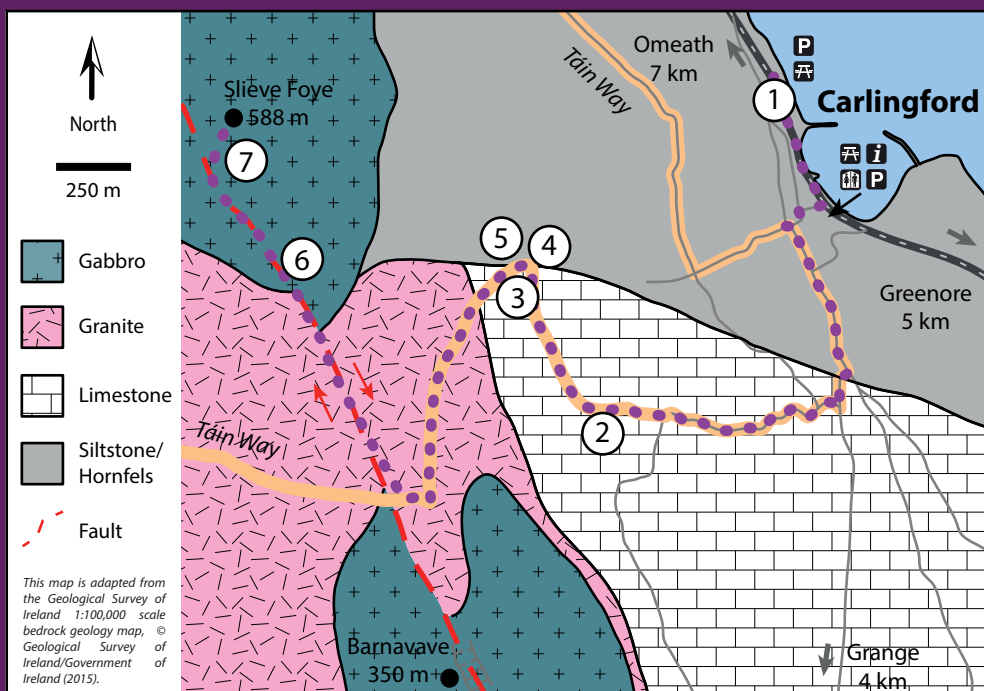


Basaltic magma can be as hot as 1200 °C. The Carlingford magmas baked the adjacent siltstones into a metamorphic rock called hornfels, and the limestones into marble. On these slopes you will find hornfels that was heated so much that it started to melt in places. The softened rock layers were further folded as the magma forcefully intruded to higher levels.



As you walk, compare the rugged slopes of Slieve Foye to the rounded Mourne Mountains across the lough. Slieve Foye is made of gabbro, an extremely hard igneous rock. It is more difficult to erode than granite, and so forms steep, angular crags, rather than rounded hills. This is also why there is a low col between Slieve Foye and Barnavave. Here, the easily eroded microgranite is poorly exposed.

The large sloping rock inside the bend of the path is known as the Slate Rock. It is made of a sedimentary rock called conglomerate. The vertical surfaces expose the sedimentary layers, and you can see large pebbles in a matrix of quartz sand and gravel. This conglomerate rests just below the Carlingford Limestone, which formed in a shallow tropical sea ~340 million years ago. The limestone above is easily eroded, and while it cannot be seen here, it forms all the flat green farmland towards Greenore to the east.



The Carlingford volcano ceased erupting about 59 million years ago, but the region remained geologically active for some time. Large faults cross-cut the area and their eroded traces now form linear clefts in the landscape. The walking path follows one such fault up Slieve Foye. Looking southeast you can see the same fault cut through Barnavave, where it forms the eponymous Maeve's Gap. We can even work out which way the fault moved based on the offset geological boundaries.



The magma from which the gabbro formed was rich in iron and magnesium, giving the rock its distinctive dark colour. Gabbro has 2 main minerals, plagioclase feldspar (white) and pyroxene (black). As you walk towards Slieve Foye you are now deep inside the Carlingford volcano!

Compiled by Dr F.C. Meade for Mourne Cooley Gullion Geotourism, with contributions from Prof V.R. Troll & Dr C.H. Emeleus.



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