Trail 5: Ham Ness

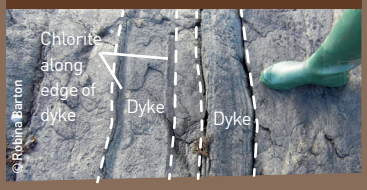
The upper layers of a typical ophiolite consist of 'sheeted dykes' topped with 'pillow lavas'. The Shetland ophiolite has lost its pillow lavas, either through erosion, or because tectonic activity has moved them. However, you can see the base of the sheeted dyke complex.

As tectonic plates are drawn apart, magma rises from the magma chamber. It is injected between the spreading plates to form new oceanic crust and erupt as pillow lavas on the ocean floor above. The process of spreading and injection, followed by cooling is repeated time and again to form parallel dykes of vertical slabs of rock at the top of the ocean crust. Because the dykes are injected into already cooled gabbro, the hot magma cools quickly, and there is little time for crystals to grow.

Dyke 3

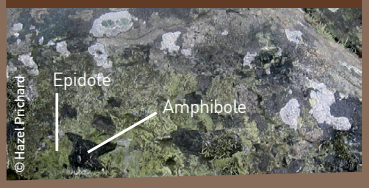
The resulting rock - dolerite - has a similar mineral composition to the surrounding gabbro but contains much smaller crystals. This allows us to identify the dykes in the field, although weathering and the growth of lichen on rock surfaces can make them hard to see!

Dyke 4



The best example (4) can only be seen at low tide on a rock platform a few metres east of the marker post, but others (3) can be found inland. Water from the ocean can enter the top of the magma chamber and cause the formation of minerals such as amphibole (very dark green), epidote (grass green or pistachio green) and chlorite (dark blue green). You may be able to find them as you explore Ham Ness (2) - further evidence that you are at the very top of the chamber.

Epidote and amphibole



Being in the upper part of the ancient magma chamber you would expect to be walking only through gabbro. However, a later tectonic movement has thrust a layer of serpentinite over the top of parts of Ham Ness (see the geological map on the trail pack folder). Differential weathering of the serpentinite and the gabbro means that in places it is easy to see the transition between the two. Look out for the rocky knoll on your right (5). This knoll is serpentinite. The serpentinite can be traced to a point where it is pinched to a narrow finger in the cliff top (7). To your left is gabbro, which can be recognised by its distinctive speckled pattern of white (plagioclase) and dark (pyroxene) crystals. Sometimes the plagioclase or the pyroxene crystals form layers within the gabbro (6) as a result of the crystallisation of magmas of slightly different compositions. More sodium and aluminium-rich magma gives plagioclase layers and more magnesium and iron-rich magma forms pyroxene rich layers.

Serpentinite and gabbro

Plagioclase layering

Directions from Watlee — Allow 2 hours

By car / bike: Head south and turn left for Uyeasound. Drive through Uyeasound, follow signs to Muness and park (1).
Follow the waymarked route clockwise around the coast of Ham Ness, looking out for marker posts at 3, 4, 6 & 7.

Interpretation

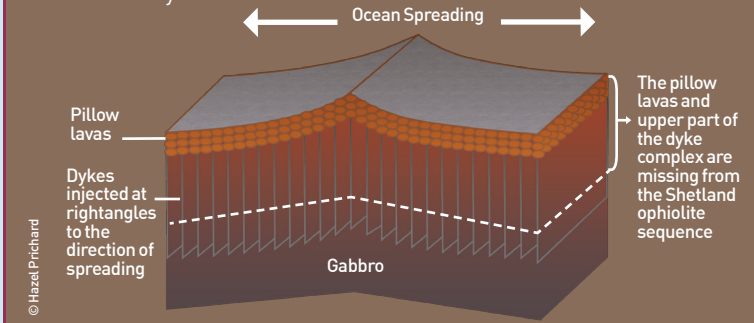
- Marker posts at key sites.

Access

- Most of the ground is easy going and crosses farmland. Cliffs are high and steep in places; there are no warning signs or barriers.
- Strong winds can make this walk dangerous so check the weather forecast before setting out.
- Some of the features cannot be seen at high tide.
- Shetland rams sometimes graze in Castleton.
- The route includes a number of two step stiles.

Facilities

Available in Uyeasound.



Formation of sheeted dykes at top of magma chamber