Where to see the Whin Sill

You can see dramatic exposures of the Whin Sill at several places in northern England. Visit Upper Teesdale in the North Pennines to see it at the waterfalls of High Force, Low Force and Cauldron Snout, and at the crags of Holwick Scars, Falcon Clints and Cronkley Scar.

The Whin Sill forms a spectacular ring of cliffs towering over the deep valley of High Cup Gill.

In Weardale you can see the Little Whin Sill in the Rookhope Burn and in the disused quarry at Greenfoot, near Stanhope.

In the Northumberland Coast AONB the Whin Sill forms the Farne Islands and some dramatic stretches of coastline. In the Northumberland National Park the Whin Sill is a formidable natural rampart for Hadrian’s Wall.

The Whin Sill is one of the most famous and dramatic natural features of the North Pennines – and its origins are just as spectacular.

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The AONB Partnership has a Green Tourism award for its corporate office
The Whin Sill is one of the most famous and dramatic natural features of the North Pennines – and its origins are just as spectacular. Its formidable cliffs and rocky crags tell a story of molten rock, minerals, quarrymen and worldwide fame!

Molten rock
About 295 million years ago, molten rock, or magma, at over 1000°C, rose up from deep within the Earth. The magma spread out between the layers of limestone, sandstone and shale which lie beneath much of the North Pennines. It cooled and solidified underground to form a huge sheet of rock up to 90 m thick – the Whin Sill. This is made of a hard dark rock called dolerite or, as it is known locally, whinstone. Dolerite is a type of igneous rock – one which is formed when molten rock solidifies. After millions of years of erosion the Whin Sill is now exposed at the surface in several places.

Crystal kaleidoscope
Look closely at a piece of freshly broken dolerite and you'll see that it is a mass of small crystals. The dark crystals are the mineral pyroxene and the white flecks are feldspar. These minerals crystallised out of the magma as it cooled. When cut into very thin slices, only about 0.03 mm thick, and viewed under a polarising microscope, the Whin Sill has jewel-like colours and intricate crystal shapes.

Cracks and columns
The Whin Sill probably took around 50 years to cool from molten rock to solid dolerite. During the final stages of cooling it contracted, producing vertical cracks along which the rock breaks into rough columns. You can see these cracks and columns in Whin Sill cliffs and quarry faces.

Cooked rocks
When the Whin Sill was molten it had a huge effect on the surrounding rocks. In Upper Teesdale, a limestone layer was baked and altered to a white, crumbly, crystalline marble, known as ‘Sugar Limestone’. This unusual rock supports the unique ‘Teesdale Assemblage’ of arctic-alpine plants, including the beautiful spring gentian.

What’s in a name?
The Whin Sill took its name from terms used by northern quarrymen – ‘whin’ was a hard dark rock and a ‘sill’ was any flat-lying layer of rock. When 19th century geologists worked out how the Whin Sill formed, the word ‘sill’ was adopted for all similar bodies of igneous rock worldwide. The Whin Sill is therefore famous for being the original sill of geological science!

Working the whinstone
There is a long history of whinstone quarrying in the North Pennines, and the industry continues today at Force Garth Quarry in Upper Teesdale, where the Whin Sill is worked for roadstone.