

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.



◀ Holwick Scars

▼ Falcon Clints



▼ On the North Pennine escarpment, near Dufton, 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.

Front cover photo: High Force, Upper Teesdale

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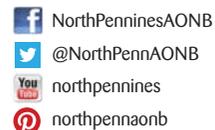
NORTH PENNINES
Area of Outstanding Natural Beauty



The North Pennines is one of England's most special places – a peaceful, unspoilt landscape with a rich history and vibrant natural beauty. In recognition of this it is designated as an Area of Outstanding Natural Beauty (AONB). The area is also a Global Geopark – an accolade endorsed by UNESCO.

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

North Pennines AONB Partnership
www.northpennines.org.uk
+44 (0)1388 528801
info@northpenninesaonb.org.uk



The AONB Partnership has a Green Tourism award for its corporate office

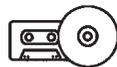


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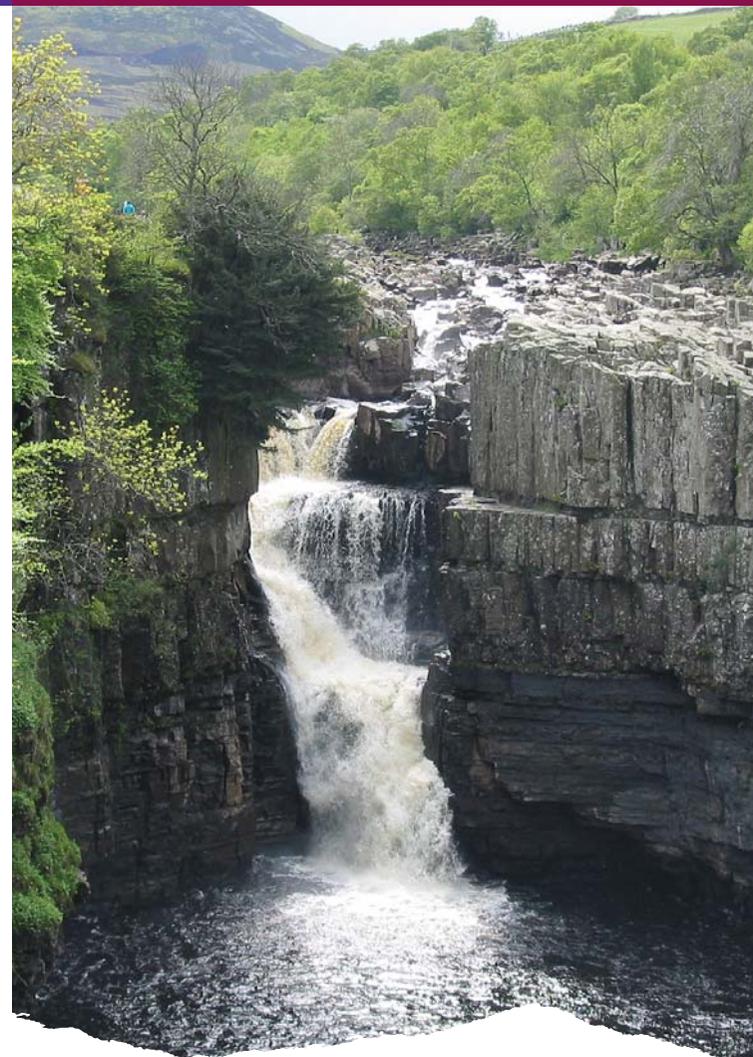


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The Whin Sill

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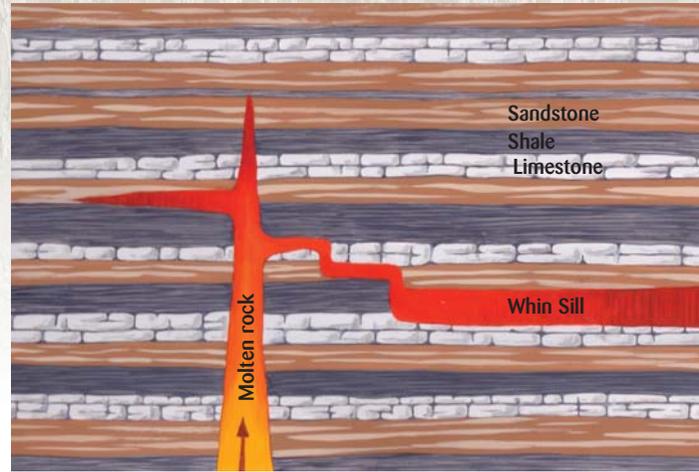
NORTH PENNINES
One of the
AONB family

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.

How the Whin Sill formed ▶



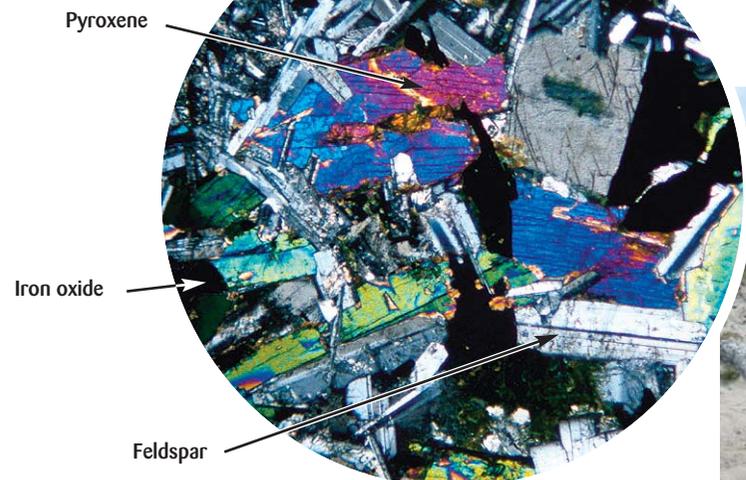
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Crystal kaleidoscope

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.

A microscopic view of the Whin Sill, viewed under polarised light.

Actual size ○



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.



Columns in the Whin Sill at High Cup Gill ▶



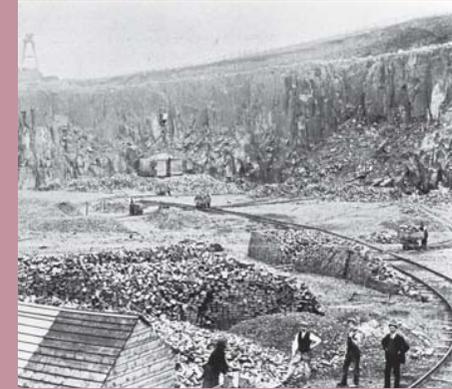
Cooked rocks

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.

◀ Sugar Limestone near Cow Green Reservoir

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.



◀ Middleton Quarry in the early 20th century. The stone blocks piled in the foreground are whinstone 'setts' for paving.

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The now disused **Greenfoot Quarry**, near Stanhope in Weardale in the Little Whin Sill, a thinner sheet of dolerite which lies above the main Whin Sill.



Dolerite is rarely used as a building stone as it is very hard and difficult to work. However, in places like **Holwick in Upper Teesdale**, which are close to outcrops of the Whin Sill, a few buildings are made of dolerite.



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!