

Welcome to the North Pennines

Welcome to the North Pennines Area of Outstanding Natural Beauty (AONB) and European & Global Geopark. This is a special place of high moorland, wild fells, waterfalls, green dales, stone walls, scattered settlements, fantastic wildlife and a rich industrial heritage.

This unique landscape is the result of millions of years of Earth history and a few thousand years of human activity. The character of the North Pennines has its foundation in the underlying rocks and the geological processes which have shaped the fells and dales. These have influenced the plants and animals that live here, and the ways in which people have used the landscape through the ages.

▼ *The moors above Ireshopeburn, Upper Weardale*

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A special landscape

Because of its stunning landscape the North Pennines is an Area of Outstanding Natural Beauty (AONB). It is also a UNESCO-endorsed European and Global Geopark in recognition of its superb geological heritage.

An Area of Outstanding Natural Beauty

Areas of Outstanding Natural Beauty (AONBs), along with National Parks, represent some of our finest countryside and are within a worldwide category of protected landscapes. The designation of the North Pennines AONB was confirmed in 1988. It includes parts of the counties of Durham, Northumberland and Cumbria, and at nearly 2,000km² it is the second largest of the 38 AONBs in England and Wales. Visit:

www.northpennines.org.uk and www.landscapesforlife.org.uk



▲ *The Shropshire Hills, another AONB with a rich geological heritage*

▼ *The English Riviera Global Geopark*



A European and Global Geopark

The North Pennines AONB is also Britain's first European Geopark. It was awarded this UNESCO-endorsed status in 2003, and in 2004 became a founding member of the Global Geoparks Network. Geoparks are places with outstanding geology where special effort is made to make the most of Earth heritage through interpretation, education, conservation and tourism. There are several other Geoparks in the UK and a growing number around Europe and the rest of the world. Visit:

www.europeangeoparks.org



Exploring the North Pennines

In each section in this book there are suggestions of interesting places to visit. These are just a small sample of what the North Pennines has to offer; if you get out and about you'll discover many more. The grid references are for the sites themselves rather than viewpoints. Where a location covers an area or is a linear feature, the grid reference is for a roughly central or other obvious point.

Unless otherwise indicated, the locations are accessible or visible from public roads, public rights of way or permissive paths, or are on access land (shaded yellow on new OS Explorer maps).

Please follow the Countryside Code and Moorland Visitor's Code (for more information on these and access land visit www.northpennines.org.uk). Please be particularly careful around quarries (both disused and working) and old mine sites. These can be dangerous places so please view from a safe distance.

A moving story

The landscape of the North Pennines tells a story that began almost 500 million years ago – at a time when the Earth was a very different world and Britain as we know it did not exist.

Dynamic Earth

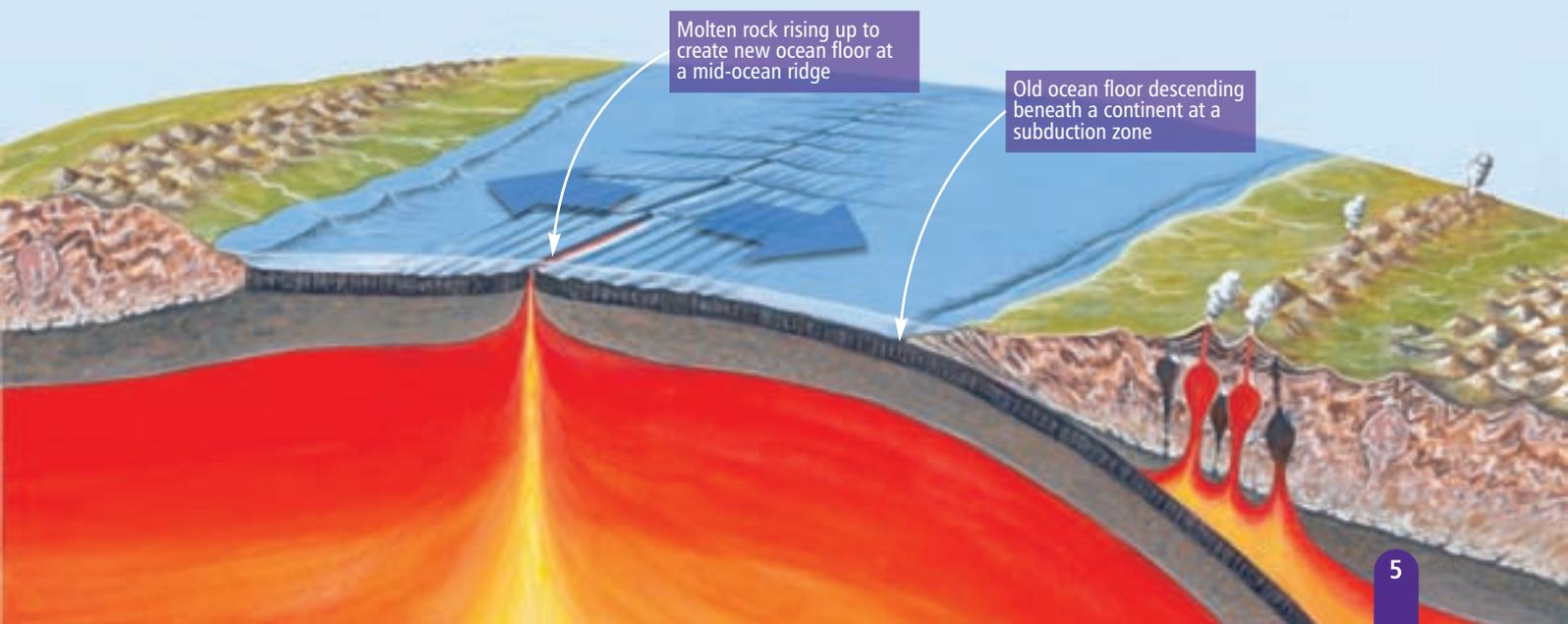
Over millions of years, the piece of the Earth's crust containing what is now the North Pennines has travelled vast distances over the surface of the globe. This is because of plate tectonics, the process by which the plates that make up the outer layer of the Earth are constantly on the move. These plates, which carry the continents and oceans, pull apart, collide and slide past each other. Where they pull apart, oceans are created and where they collide, oceans close and mountain ranges rise. The plates move a few centimetres a year – about the speed our fingernails grow. This may not sound much but over millions of years plates move vast distances. Because of plate tectonics the North Pennines has been on a remarkable journey, one that is recorded in the area's rocks, fossils and landscapes.

▼ *The outer layer of the Earth is constantly changing, as plates carrying the continents and oceans pull apart and collide*

Stories in stone

During this incredible journey the North Pennines has been shaped by many different geological processes, environments and climates. The rocks that form the fells and dales of the North Pennines tell of this journey. By reading the landscape and spotting clues in the rocks, we can discover a fascinating story – of a deep ocean and violent volcanoes, colliding continents and molten rock, tropical seas and lush rainforests, hot water and minerals, desert dunes and vast ice sheets. In the last few thousand years – just the blink of an eye in geological terms – North Pennine people have further shaped the landscape with settlements, farms, quarries and mines. And it is still evolving – through a combination of natural processes and human activity.

We hope this book will encourage you to discover and explore the North Pennine landscape and find out more about the fascinating story it tells.

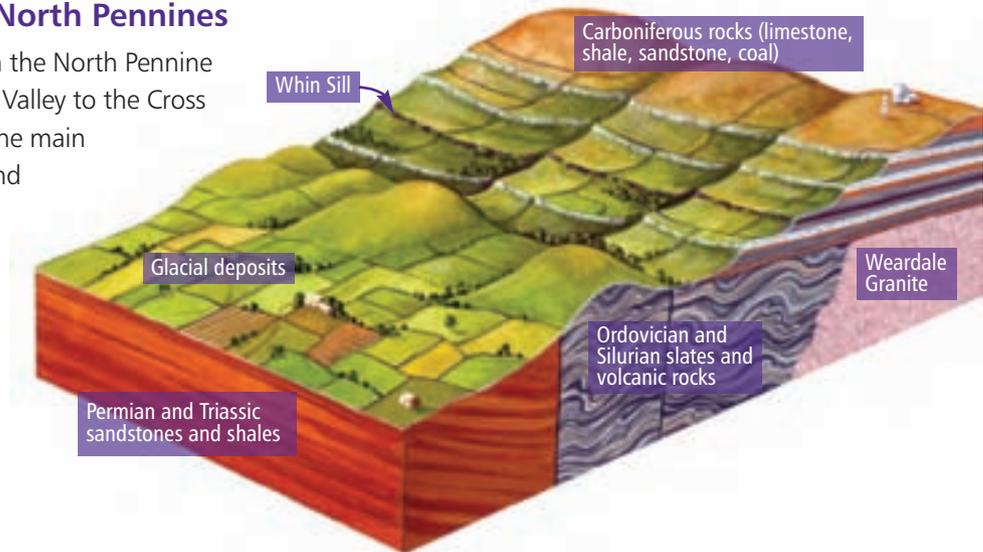


Foundations of the landscape

Rocks are the basic building blocks of the landscape and influence every aspect of the countryside. The many types of rock that make up the North Pennines can be seen on the geological map and cross-section. They formed in different ways and at different times in Earth history – as you’ll discover in this book.

A slice through the North Pennines

This imaginary slice through the North Pennine escarpment, from the Eden Valley to the Cross Fell range, shows some of the main features of the landscape and how they relate to the underlying rocks. The labels indicate the main rock units – see the timeline below for when these formed.



Journey through time

This timeline for the North Pennines extends from the birth of the Earth to the present day. It is divided into chunks of time known as periods. The coloured time intervals indicate the periods for which there is evidence in the North Pennines, and there are brief descriptions of the geological events that have created today’s landscape – read on to find out more...

Millions of years ago	4,600 to 542	542 to 488	488 to 444	444 to 416	416 to 359	359 to 299
Period	Precambrian	Cambrian	Ordovician	Silurian	Devonian	Carboniferous
	A vast period of time during which the first life on Earth emerged. The oldest rocks in Britain – the Lewisian Gneisses of NW Scotland – are about 3,000 million years old	The Iapetus Ocean separated the continents of Laurentia (including Scotland) and Avalonia (including England)	Mud, sand and volcanic ash accumulated in the Iapetus Ocean as it started to close	The Iapetus Ocean closed and the continents of Laurentia and Avalonia collided creating the Caledonian Mountains	The Weardale Granite was injected deep into the roots of the Caledonian Mountains, which eroded rapidly in a hot climate	The North Pennines lay at the equator and was covered by tropical seas, deltas and rainforests. Most North Pennine rocks formed at this time