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# Cumbria Rocks — 60 extraordinary rocky places that tell the story of the Cumbrian landscape

Ian Jackson

‘...to look at the scenery of Cumberland and Westmorland without trying to understand the rock is like listening to poetry in an unknown language – you hear the beauty of the sounds, but you miss the meaning. For the meaning is the rock.’

Norman Nicholson 1914–1987

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## Endorsement

“A splendid book that awakens millions of years of geological turmoil. The result is a thrilling tale that brings the events that shaped our landscapes to life.”

Eric Robson OBE DL is a television broadcaster, author and documentary film maker who has lived for most of his life in Cumbria.

As England's second largest county covering nearly 7000 square kilometres, a coastline of more than 180 miles — and boasting the 34 highest peaks in the country, Cumbria\* has an unrivalled wealth of geological interest and an amazing variety of landscapes.

The wonderful array of rocks and landforms is not only important in its own right but provides the foundation for all of our habitats and wildlife. Geology has been central to Cumbria's history, economy, food and culture over millennia.

In this accessible and richly-illustrated book, Cumbrian Ian Jackson tells the fascinating and revealing stories of the county's geology through 60 special places.

Cumbria Wildlife Trust has always recognised the importance of geology and its conservation in our work. The promotion of a deeper understanding of geology has been a core objective for the Trust since 1962. This book, which celebrates our 60th anniversary in 2022, is the latest contribution to this mission.

Through our nature reserves but especially through the outstanding voluntary work of the Cumbria Geodiversity Conservation Group, we seek to record, conserve and promote the geology in our county. If this book sparks an interest, as I'm sure it will, please do join the Group and/or attend some of its events.

I hope this superb book will help everyone to appreciate the rocks beneath our feet and why they are so important to our past, present and future.

Stephen Trotter, Chief Executive, Cumbria Wildlife Trust

*\* Cumbria was created as a political entity in 1974 by the amalgamation of Cumberland and Westmorland and small parts of Lancashire. From 2023, two counties: Cumberland; and Westmorland and Furness, will be established.*

## **Preface**

Mention Cumbria and most people immediately conjure up an image of the Lake District. That's hardly surprising; its mountains and lakes are dramatic and magnificent. But almost two-thirds of Cumbria lies beyond the National Park and this too is a landscape of outstanding beauty and rich wildlife and heritage.

This book tells the story of the landscape of all Cumbria through 60 special places. There are many, many sites which could have been chosen. The places that made it into this book are a personal selection, ones which I felt would best explain and illustrate the evolution of the landscape of the whole county across geological time, and be accessible to visit. But I also wanted to emphasize the relevance of rocks to our everyday lives. That relevance can sometimes lead to controversy.

There are many excellent guide, photographic and geological books about Cumbria. Their focus has, understandably, been on the Lake District. It is also true that the explanation of the geology in guidebooks and photographic books is often minimal and sometimes wrong. Equally, there are many geological publications available and these contain detailed explanations which address the needs and interests of professional and amateur geologists.

The aspiration of this book, which follows one describing Northumberland, is to tell the story of Cumbria's rocks in a way that is understandable to everyone curious about the landscape of the county and to ensure that the information is scientifically correct and up-to-date.

I hope the book encourages you to explore all of Cumbria and, in Norman Nicholson's words, appreciate the meaning behind the beautiful scenery.

## **Sources and acknowledgements**

The prime sources of information for this book are the maps, memoirs and reports produced by field geologists of the British Geological Survey (BGS).

I would particularly like to thank friends and former colleagues Brian Young, Tony Cooper, Dave Millward, Doug Holliday, Russell Lawley and Mike Howe for sharing their expertise.

BGS maps provide both comprehensive geological cover and essential detail and they are the foundation for virtually all scientific and applied research which seeks to understand the rocks of Cumbria and the UK. Many other books, scientific papers, articles, fieldtrip guides and web sites have also been consulted and I would like to acknowledge their authors,

especially Clive Boulter for his excellent web synopsis of Lakeland Geology. May I pay tribute to the Geological Societies of Cumberland and Westmorland and the Cumbria GeoConservation Group for their continuing commitment to look after and make the geology of the county accessible.

Steve Trotter and Angus Lunn took on the challenge of providing information on the flora and fauna of several sites (within an unreasonable word limit!). Google, Wikipedia and many websites were searched to seek out information on the historical and cultural backstories. Reading a rich seam of natural history blogs was a real joy. Tony Cousins, Angus Lunn and Abigail Burt kindly proof-read and edited the text, but any errors in the descriptions are mine.

Thank you to my wife Gill and walking friends for allowing me to (again) hijack their hikes. The majority of the photographs were taken with my iPhone, but I'm hoping that Cumbria's stunning scenery will make up for that.

Finally thank you to Cumbria Wildlife Trust who generously supported publication of this book. All author's royalties will go to the Trust.

## **Endnote**

Norman Nicholson's words on the title page hint at one thing I hope this book will do: challenge an oft-held perception that the Cumbrian landscape is largely the product of human hands, be that agriculture or architecture. Human influence on the landscape has been considerable but in the grand scheme of things, merely scratches the surface, it is cosmetic and beauty is more than skin deep.

I am, of course, biased, but it is the rocks and the processes that shaped them over almost 500 million years that are literally the bedrock of the county, the origin of its resources, the basis of its scenery and ultimately the foundation of its economy and heritage.

I hope this book helps you see Cumbria with new eyes and encourages you to explore the whole county and its diverse and beautiful places. I hope it makes you curious about what lies beneath your feet and helps you understand why these amazing places are like they are.

Grab your boots and see for yourself!

## **The author**

Ian Jackson was born and raised in Carlisle. His love of rocks began in the late 1950s in the Caldbeck Fells and valleys around Martindale. He has a degree in geology and geography from the University of Newcastle upon Tyne and is a Chartered Geologist and Fellow of the Geological Society. He spent 18 years surveying the geology of parts of the north of England, including Cumbria, for the British Geological Survey. Later he was responsible for national and international programmes that produced the first UK, European and global digital geological maps and made them web accessible. He retired from the position of BGS Operations Director in 2011 and moved to Bardonia Mill in Northumberland. He hikes in Cumbria and Northumberland every week. In addition to many scientific maps, articles and reports, he is the author of Britain Beneath Our Feet, an atlas of the UK's geology, and Northumberland Rocks, a sister publication to this book.

## **List of resources**

### [Cumbria Wildlife Trust](#)

Cumbria Wildlife Trust is a charity dedicated to safeguarding the wildlife and wild places of Cumbria - and helping people to get closer to nature. The Trust aims to bring wildlife back to the county, to help empower people to take meaningful action for nature, and to create an inclusive society where nature matters.

One of our core purposes is to help record, protect and promote a better understanding of the geological heritage of Cumbria.

The Trust manages more than 40 nature reserves across 10,000 acres. We work in partnership with local communities and others to help address the twin crises of biodiversity loss and climate change in Cumbria.

We are one of 46 Wildlife Trusts, a grassroots movement working across the UK to make life better — for wildlife, for people and for future generations. Our vision is of a thriving natural world, with our wildlife and natural habitats playing a valued role in addressing the climate and ecological emergencies, and everyone inspired to get involved in nature's recovery.

In 2022 the Trust had its 60th Anniversary. This book telling the story of Cumbria's geological heritage and its connections to wildlife is a celebration of those 60 years.

## **Back cover**

This book reveals the incredible story of the Cumbrian landscape through 60 special places and connects its rocks to wildlife, history, economy and culture.

The book will help you see Cumbria with new eyes and encourage you to explore the whole county and its diverse and beautiful places, and understand why they are as they are.

Pull on your boots and climb over remnants of old volcanoes and deep oceans, experience the power of ancient earthquakes, walk over a crag that was once a coral sea, witness the awesome force of the last Ice Age or simply wonder at the ingenuity of our ancestors who used these rocks in so many ways to create our shared heritage.

Using the latest research and scientifically accurate information, Cumbria Rocks also explains why geology is relevant to our lives today, whether that be the disposal of radioactive and toxic waste or climate change and future flood risk. It chronicles the role that rocks have played in building our heritage and culture from mining and building stones to poetry and art.

Through rich and relevant photography and straightforward, understandable, explanations it reveals how the amazing diversity of the landscape of Cumbria has come to be.

You will never look at your landscape in the same way again.

## **Introduction**

Cumbria's rocks span almost 500 million years of Earth's history. From the time when life in primordial oceans was exploding, through periods of scorching red deserts and sub-zero Ice Ages right up to today and the sediments being deposited in our lakes, rivers and seas. All of these are part of our geological story\*.

This diversity of the rocks makes Cumbria a unique and special place in Britain and is the reason that the landscape we see today has such amazing variety, from the fells of the Lake District, to the cliffs and marshes of the coast, the green pastures of our vales and the moorlands of the Pennine hills.

It is a diversity that has been exploited, by wildlife, by those mining for ore and coal but also by poets and artists like Wordsworth and Turner and today by millions who visit the county for its spectacular scenery and outdoor activities.

This book reveals the incredible story of the Cumbrian landscape through 60 special places and connects its rocks to wildlife, history, economy and culture.

To tell the story and make those connections the 60 sites have been divided into five themes but it is acknowledged that many could easily fit into several of these themes.

*\* Some will argue, not unreasonably, that several sites in this book are hardly rocks. True, but collectively the 60 sites tell the full story of Cumbria's landscape and set in context the brief narrative of humankind.*

## Cumbria's geological journey

Cumbria and its rocks started their journey close to the South Pole around 485 million years ago. Back then, Cumbria was between two continents and at the bottom of a deep ocean which was filling with mud and sand. The tectonic plates carrying the continents grew closer, forcing one deep beneath the other. Pressure and heat melted the rocks and the molten magma not only filled huge chambers deep underground, which were to become granite, but erupted vast amounts of volcanic ash and stones. The ocean continued to fill with sediments and eventually closed, while forces within the Earth buckled the crust into a huge mountain chain.

Millions of years of erosion wore those mountains down and covered a subdued desert landscape in sand and gravel. Around 350 million years ago our itinerant piece of the tectonic plate was almost at the Equator and our environment had changed too: large rivers ran through tropical swamps and into warm coral seas. Sea level rose and fell as the Earth's ice sheets grew and then receded. Our drift north continued and desert conditions returned. Earth movements created tension in our northern rocks and deep down, hot molten magma was injected along cracks and fissures. On the surface sand dunes migrated across a hot plain and flood-prone rivers deposited even more red sand and silt. For the next 150 million years seas teeming with life covered the county completely. But of those seas and their rocks there is little or no sign, for other than a small remnant, all that too was eroded away.

The tectonic plates continued their erratic waltz and 60 million years ago lava started to pour out of an enormous rift that was to become the Atlantic Ocean. North America and Europe have been drifting apart ever since. 2.6 million years ago the Earth's temperature began to fluctuate again; we cooled and then warmed, repeatedly. Ice caps extended to lower latitudes, glaciers grew and then retreated and as they did trees and plants recolonised the landscape. Humans emerged and began to exert their influence on the county, clearing forests and settling in the valleys. But it is society's development and our impact on the planet in the last 150 years that far outstrips the previous 300,000 years of our existence.

## Photographs

(Photo 00-1) Front cover. Grange Fell.

(Photo 00-2) Ian Jackson, the author Looking north into Borrowdale.

(Photo 00-3) Fleetwith Pike, looking towards Honister Pass.

(Photo 00-4) St Bees Sandstone Fleswick Bay.

(Photo 00-5) Looking north from St Bees Head.

(Photo 00-6) Looking southwest across the Vale of Eden from Hartside Pass.

(Photo 00-7) M6 at Tebay looking south.

(Photo 00-8) Looking south down Crummock Water

(Photo 00-9) Rear cover.

(Photo 00-10) 60 sites in 5 themes.

(Photo 00-11) Cumbria's geological journey.

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*(Photo 00-1) Front cover. Grange Fell.*





*(Photo 00-2) Ian Jackson, the author.*





(Photo 00-3) Fleetwith Pike.



(Photo 00-4) Fleswick Bay, St. Bees Head.





*(Photo 00-5) Saltom Bay and Whitehaven.*



*(Photo 00-6) Looking southwest across the Vale of Eden from Hartside Pass.*

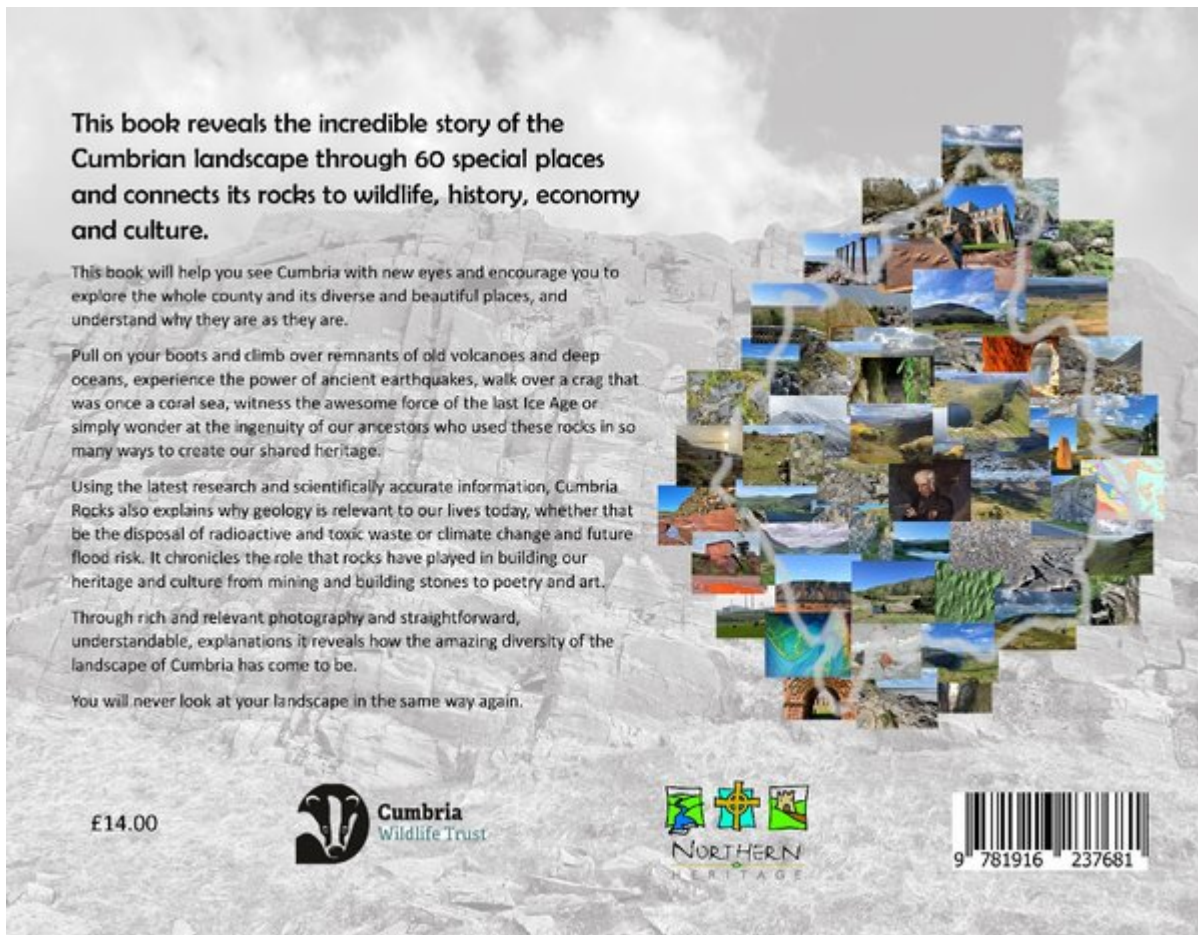


*(Photo 00-7) M6 at Tebay looking south. Lunedale.*

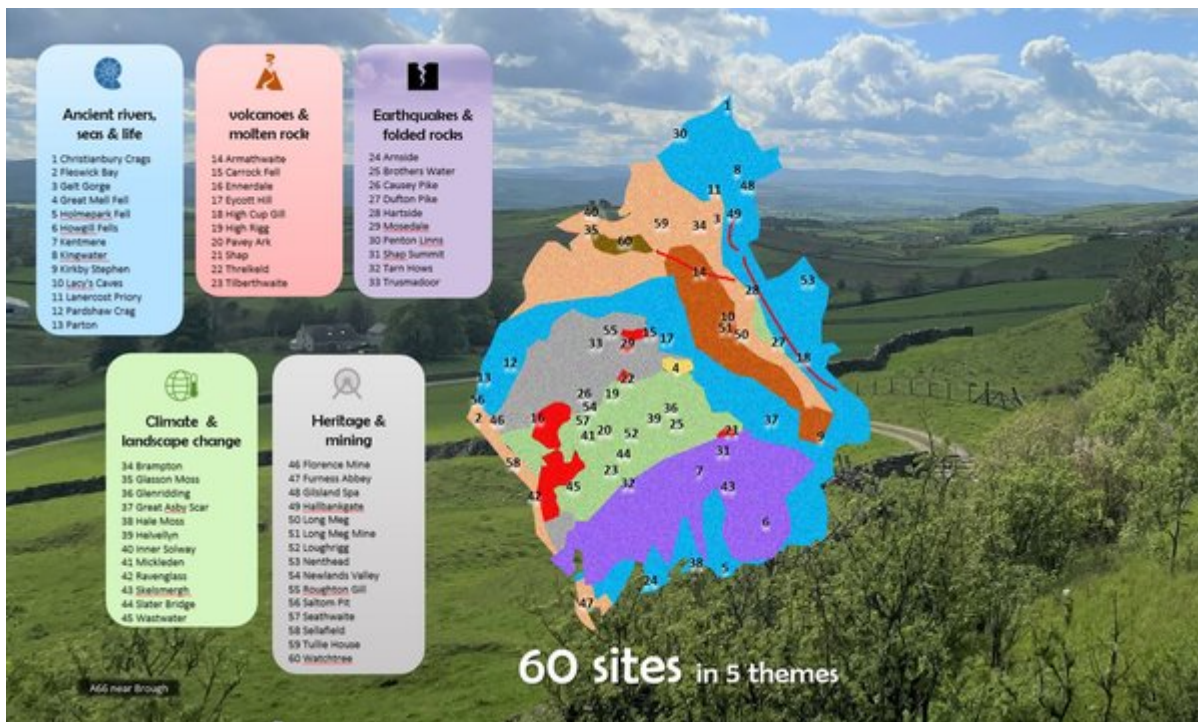


*(Photo 00-8) Looking south down Crummock Water*





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