An introduction to the Geological Conservation Review

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Foreword

In the rocks and landscapes of Britain lies the evidence for ancient events which fashioned the small but complex part of the Earth's crust that we now call the British Isles. By piecing together this evidence, it is possible to construct the geological history of Britain. Magnus Magnusson, the Chairman of Scottish Natural Heritage and one of my colleagues on the Joint Nature Conservation Committee, said that:

'Our geological past involves a barely believable story of whole continents moving around like croutons floating on a bowl of thick soup, of great oceans forming and disappearing like seasonal puddles, of mighty mountains being thrown up and worn down, of formidable glaciers and ice caps advancing and retreating behind mile-thick walls of ice as they melted and reformed again. Scotland has been a desert, a tropical rain forest and a desert again; it has drifted north over the planet with an ever-changing cargo of lizards, dinosaurs, tropical forests, giant redwoods, sharks, bears, lynx, giant elk, wolves and also human beings.

'There is a fascinating story to tell that is of profound relevance to the world.'

What Magnus Magnusson said about the geological history of Scotland is also true for Britain as a whole. There is indeed a fascinating story to tell, although some of the chapters are still far from complete. For the full story to unfold it is vital that the important rocks and landforms of Britain must be protected so that they can provide the necessary scientific resource for future work. And this may well utilise new scientific techniques yet to be discovered.

Britain was the cradle of modern geology, and observations made by British geologists in the eighteenth and nineteenth centuries laid the foundations of the science as we know it today. Many of the sites at which these observations were made continue to be conserved as a part of our national Earth heritage. The contribution that the geology of Britain has made to international science is as important today as it has ever been. British sites are world-renowned for providing the milestones that mark geological time and the benchmarks that define geological principles. There is every reason for us to take a special pride in this unrivalled Earth heritage.

Since the heady, pioneering days in the early development of the Earth sciences, the study of the geology of Britain has continued to provide evidence to construct, and then test, theories about the development of the Earth and the processes that take place within its interior and on its surface. Geology today is as much about the future as it is about the past. By learning about past climates we can understand our present climate system better and thus how to evaluate the impact of future climatic changes.

The geology of Britain has contributed to our national wealth and so influenced our archaeological and industrial inheritance, from the Phoenicians trading for Cornish tin, to the coal and iron which created the Industrial Revolution and, now, to the oil and gas below our coastal seas which is essential to our economic well-being. The geologists of tomorrow, who will discover new economic resources and locate sites for new engineering works all over the world, are being trained in an environment of extraordinary geological quality.

Natural landforms create the environments within which the diverse flora and fauna of Britain live. Rocks provide the soil and influence the drainage conditions of biological habitats. Biological and geological forms and functions are inextricably linked to create a series of natural systems of immense richness and diversity.

Active conservation measures are required to protect the geology and landforms of Britain as an important and irreplaceable scientific, educational, cultural, aesthetic and potentially economic resource. If irreparable damage or loss was to occur then it is our own society that would be impoverished.

Conservation of geological and geomorphological sites has always been part of the responsibilities of the statutory nature conservation agencies. A major initiative to identify and describe the most important geological sites in Britain began in 1977, with the launching of the Geological Conservation Review. This book provides a description of the methods and practice of the Review, as well as a background account of the geological history of Britain which demonstrates clearly why the Earth heritage of this country is so important.

I am confident that this book will be an invaluable reference for those who wish to understand the Geological Conservation Review and for those who need to manage our extraordinarily diverse Earth heritage.

Selbourne [signature]

The Earl of Selborne KBE FRS

Chairman, Joint Nature Conservation Committee

(Frontispiece)

Introduction to the Geological Conservation review [Rear cover]

The purpose of this book is to explain why Britain's Earth heritage is important and how the national series of Earth heritage sites was identified in the Geological Conservation Review. It also describes how these sites are protected by law and how they are conserved.

This volume is intended primarily for all those with an interest in managing the land: owners and occupiers, managers, planners and those involved in the waste disposal, mineral extraction, construction and coastal engineering industries. It will also be of interest to professional and amateur Earth scientists, conservationists, and teachers, lecturers and students of the Earth sciences.

The aim of the Geological Conservation Review Series is to provide a public record of the features of inter est an importance at localities already notified, or being considered for notification, as 'Sites of Special Scientific Interest' (SSSIs). All 42 volumes in the series are written to the highest scientific standards and incorporate the cumulative insights of generations of leading Earth scientists, in such a way that the assessment and conservation value of the sites is clear. This volume is the introduction to the Series.

The geology of south-west England gives rise to some of Britain's most spectacular landscape and rich miner al resources, ranging from tin to china clay and building stones. The scientific study of the rocks in this region has yielded greater understanding of how northern Europe underwent a period of mountain building some 300 million years ago. These immense earth movements were accompanied by the emplacement into the existing country rocks of vast bodies of molten igneous rock which cooled to form granite. The photograph shows Haytor Rocks, Dartmoor, an excellent area in which to examine the textural and compositional variations in the main suite of Dartmoor granites. This is the reason for the selection of the site as a Geological Conservation Review site. The Dartmoor granite is also renowned for dramatic tor scenery and Haytor is widely visited as a classic example of such a landscape. Photograph by: S. Campbell

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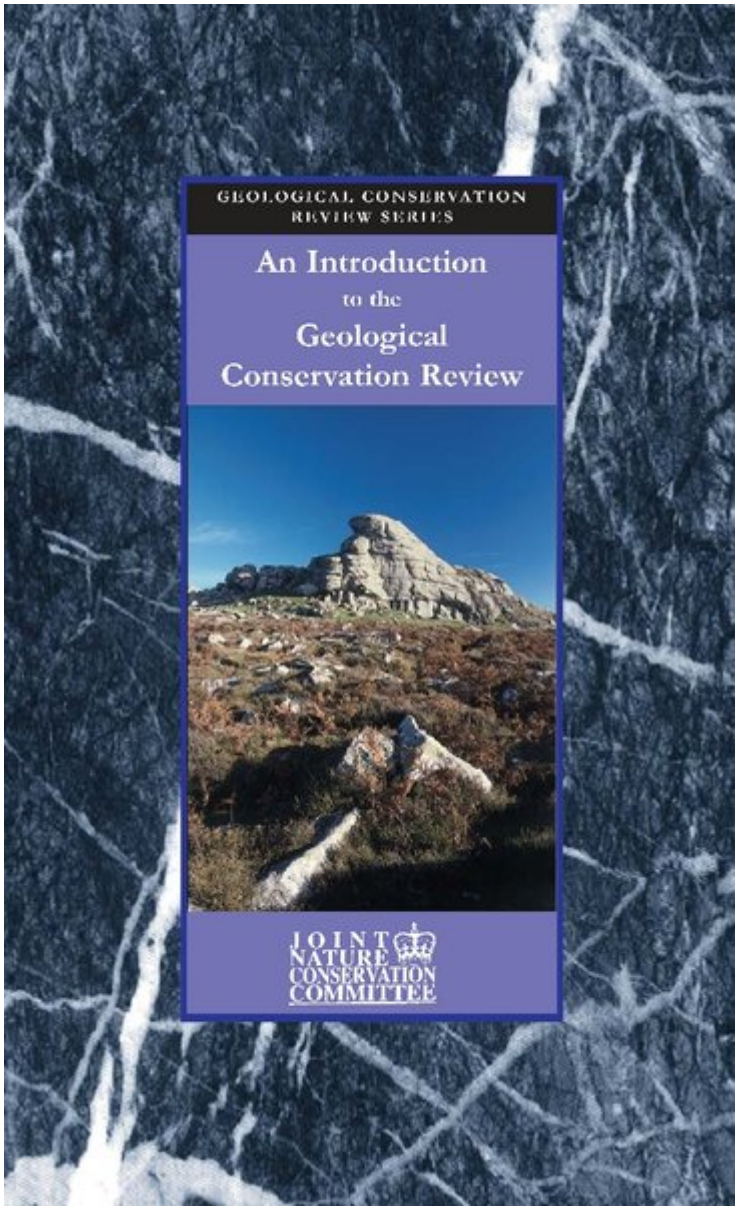

References and further reading

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An Introduction to the Geological Conservation Review

The purpose of this book is to explain the significance of Britain's Earth heritage — our inheritance of rocks, soils and landforms — and how the national series of Earth heritage sites was identified in the *Geological Conservation Review*. It also describes how these sites are protected by law and explains the practical considerations involved in their conservation.

This volume is intended primarily for all those with an interest in managing the land: owners and occupiers, managers, planners and those involved in the waste disposal, mineral extraction, construction and coastal engineering industries. It will also be of interest to professional and amateur Earth scientists, conservationists, and teachers, lecturers and students of the Earth sciences.

Geological Conservation Review Series 1

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(Frontispiece) An artist's impression of the Earth from space, as it might have appeared some 360 million years ago. The outline of present-day Britain is shown as a dotted line. Reproduced from F.W. Dunning et al. (1978) by permission of the Natural History Museum, London.