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## Chapter 1 The subject and purpose of this volume

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 geological history of Britain is fascinating. Since the cooling of the outer part of the Earth and the formation of the oceans, whole continents have moved around the planet, repeatedly coalescing into great land masses and fragmenting again. When continents collided, great mountain ranges, including the Alps and Himalayas of today, were formed and then eroded away. The rocks of Britain record a diversity of environmental conditions that unfolded over thousands of millions of years. For some of the time 'Britain' was located in the tropics. As it drifted northwards, great sandy deserts were replaced by equatorial forests and swamps only, in due course, to become desert once more. Shallow seas between land masses became isolated from their neighbouring oceans and dwindled away. Quiet landscapes were disrupted by erupting volcanoes, lava fields cooled, vents solidified and the volcanoes passed into history. In more recent ages, 'Britain' drifted into temperate latitudes. Glaciers and ice caps have repeatedly advanced and retreated over its surface, moulding and shaping the landscape. Even today, the appearance of the land continues to change; sand dunes shift, coastlines and river valleys evolve, rock weathers and landslips alter the shape of the countryside.

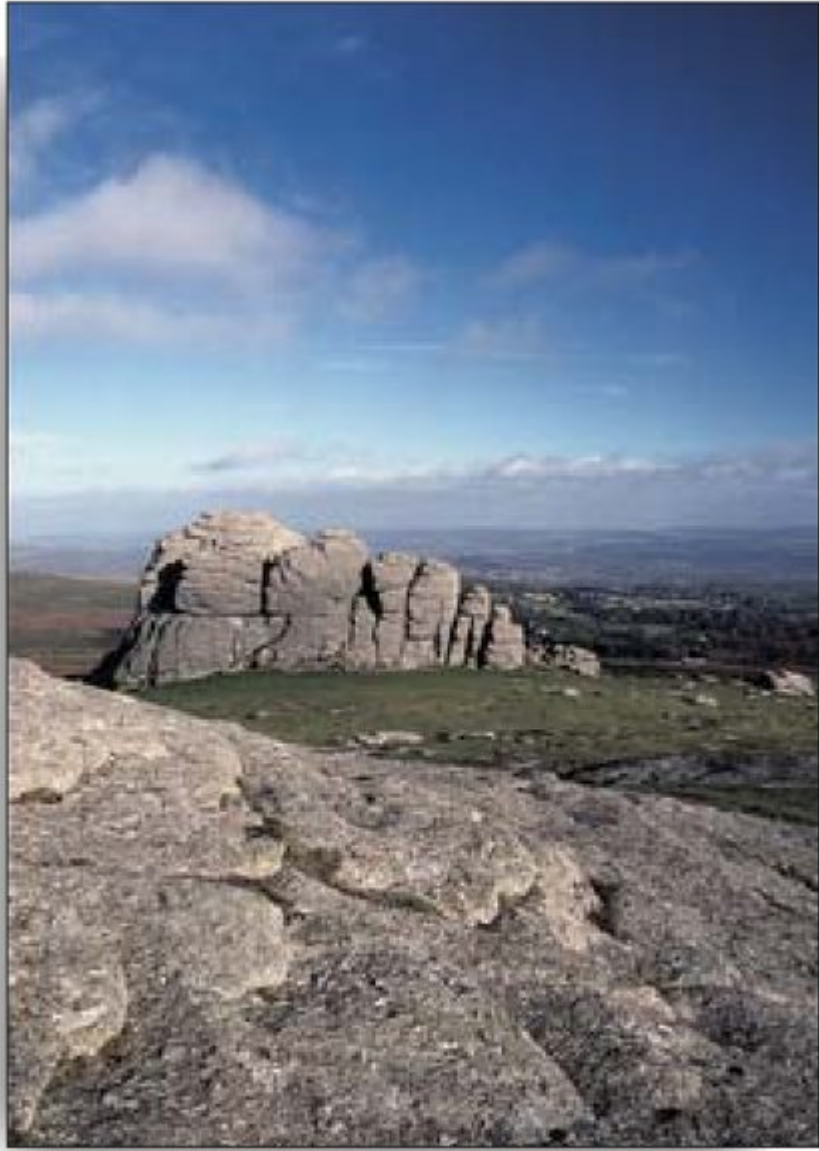
Just as the land and seas have changed over the ages, so have the life-forms they supported. Life evolved in the oceans in the form of unicellular marine organisms which helped to change the composition of the atmosphere. They eventually evolved into many types of multicellular organisms such as coral, predatory sea-scorpions, ichthyosaurs and countless other invertebrates and vertebrates. Plants, and then animals, colonised the land. Forests came and went; giant horsetails, tree ferns, redwoods and magnolias successively dominated the landscape of their time. After the land plants came insects, amphibians, dinosaurs and other reptiles, birds, mammals and, eventually, human beings.

For over two hundred years, natural historians and scientists have been piecing together the evidence for the geological history of Britain. Careful observation and interpretation of the rocks in natural and man-made exposures, and the features of the landscape, have provided both the inspiration and the information needed to establish this history. But the picture is still far from complete, there are areas of uncertainty and controversy, and much remains to be done.

The legacy of the geological past — rocks, soils and landforms — comprises the Earth heritage of Britain (Figure 1). Much of this heritage is hidden beneath the land surface, but coastal cliffs, river gorges, cliffs, mountain crags, quarries, and road and railway cuttings provide opportunities for study. Just as some activities such as quarrying and road building have created many rock exposures, they can also destroy or obscure them. Coastal cliffs have been protected to prevent erosion, disused quarries and railway cuttings have been used as tipping sites, fossil-bearing rocks have been dug up and sold for profit, and sand and gravel have been extracted for aggregate. Much of this activity has to take place in a country where land has to serve many purposes. If they are uncontrolled, these activities may ultimately lead to the loss of the most important elements of our Earth heritage. It is necessary to identify the key sites and to safeguard their future.

The identification of the most important Earth heritage sites in Britain began 50 years ago. In 1977, the Nature Conservancy Council began a systematic review of the key Earth science localities. This was designed to identify, and help conserve, those sites of national and international importance in Britain. This review, known as the Geological Conservation Review, was completed in 1990, and is an international first. No other country has attempted such a systematic and comprehensive review of its Earth heritage.

The results of the Geological Conservation Review are being published in 42 volumes written for a specialist scientific readership. This introduction to the series is written for a wider audience and includes a glossary and list of suggestions for further reading.



[References and further reading](#)

*(Figure 1) Haytor Rocks, Dartmoor, is not only an important part of Britain's natural heritage for its aesthetic quality, but also for the Earth sciences. Study of the granite rock here has revealed important information about the cooling and crystallisation of molten rock. The rocks form an impressive 'tor', formed by weathering. Photo: S. Campbell.*