The history of geoconservation: an introduction

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In many parts of the world, the regeneration, economic growth and social changes that took place in the two decades that followed the Second World War, led to increased leisure time and tourism and a greater awareness of the world around us. In addition, the realization of our ability to destroy both ourselves and the environment in which we live, clearly evident during the Cold War years, led to a greater appreciation of the fragile nature of the natural environment. By the late 1960s, increasing loss of countryside to development, and the ability to see our planet from space, led to an enhanced regard of the fragility of the environment in which we live. By the 1970s an environmental revolution, with conservation at its core, was in full swing, highlighted by the pioneering 1972 United Nations Conference on the Human Environment held in Stockholm. By the 1990s the Earth Summit, held in Rio in 1992, had placed the environment, through its role in achieving sustainable development, on the global political and social agenda. Today, it is climate change that reminds us that we have the power to do irreparable damage to the natural environment that supports us.

This book provides the first collection of papers to address the history of geoconservation. It seeks to explore the origins of the subject and the concepts that helped to define it; it describes the history of geoconservation in the UK, looks more widely to the Republic of Ireland, mainland Europe and Australia and explores the evolution and impact of global conservation initiatives including World Heritage sites and Geoparks. In doing this, it highlights the invaluable contributions to geoconservation made by academics, geological societies, governments, conservationists, volunteers and local communities. The papers demonstrate that the origin and development of this subject is interesting and informative in itself but more importantly, through revealing the history of geoconservation successes and failures, they provide us with an increased understanding of how we got to where we are now; invaluable knowledge in helping geoconservation meet the challenges that lie in the future.

Geoconservation is now a growing and widespread activity that is well established in the UK, Europe and many other parts of the world. Prior to the conference held in Dudley, England, in November 2006, there had been little thought or material published on the history of geoconservation. There are a number of reasons for this. The first is that geoconservation is a relatively new discipline that has had a low profile until the last couple of decades during which it has grown rapidly. Another is that this expansion has been sustained by a forward looking approach rather than on looking back at the history of the subject. This pattern of slow steady growth, with more recent rapid expansion, is well illustrated in the UK. Here, a few early but isolated examples of geoconservation can be identified prior to the twentieth century; conservation legislation and a nationally coordinated and structured approach to geoconservation was in place by 1950; and the rise of the voluntary sector in the form of Regionally Important Geological/geomorphological Sites (RIGS) groups (Regionally Important Geodiversity Sites in Wales) boosted activity levels and participation in geoconservation by the 1990s. By the twenty-first century, the appearance of European Geoparks has led to another step-up in geoconservation activity level. In many other parts of the world, activity levels have risen even more rapidly, jumping from relatively low levels to relatively high levels as Geoparks have opened up new opportunities and enthusiasm for geoconservation.

Geoconservation is undoubtedly an expanding and dynamic activity. It is 'happening today' and through Geoparks is growing a strong international community involving more countries than ever before. It is an exciting time for those interested in geoconservation. It is possible to demonstrate how geoconservation can inform an enlightened public and how geological and geomorphological features, processes, sites and specimens can contribute to the environmental, social and economic

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pillars of sustainable development (Webber *et al.* 2006). There is work to be done, plans to be made, partnerships to be built, funding to be secured, decision makers to be influenced and people to be enthused. With all this going on, it is not surprising that geoconservationists have, until now, been looking forward to the next challenge, rather than backwards into the history of their discipline. However, the past can inform the future and reflection is always valuable.

What is geoconservation?

Defining geoconservation, or geodiversity conservation is a subject in itself, thoughts on which can be read in Sharples (2002), Prosser (2002*a*, *b*) Gray (2004), Prosser *et al.* (2006). However, it is prudent here to highlight the difference between conservation and preservation as applied to the natural environment. Conservation can be taken as meaning the 'active management of something to ensure its quality is retained'. This places the emphasis on management of something to retain a particular quality, rather than on preservation of the feature, site, process etc. with no change at all. Geoconservation, therefore, usually involves working with natural change to retain a feature of interest, for example, maintaining a clear exposure of a stratigraphical sequence in an eroding cliff, despite the erosion. It is not about stopping the erosion and freezing the exposure in time. Preservation on the other hand, can be taken as 'keeping something in the same state, stopping it from changing', i.e. mothballing it and allowing no physical change. However, in some circumstances conservation of a finite and sensitive feature such as a mineral vein may require an approach much more akin to preservation than conservation.

In simple terms, and for the purpose of this paper, geoconservation can be defined as action taken with the intent of conserving and enhancing geological and geomorphological features, processes, sites and specimens. As successful conservation often depends on understanding and valuing the feature, process, site, or specimens to be conserved, the actions taken often also include promotional and awareness raising activities. The need for this awareness raising is captured well in the Local Geodiversity Action Plans (LGAPs) process for example (Burek & Potter 2004, 2006).

Geoconservation today

There is now a general acceptance amongst Earth scientists and conservation practitioners that our geological and geomorphological heritage is an important, and in places threatened, part of our natural heritage and that it is worthy of conservation for future generations. Many practising Earth scientists, including teachers, have first-hand experience of the need for geoconservation. Some may have witnessed the loss of a favourite exposure or have been personally involved in geoconservation activity in some way, such as through advising on the importance, value or management needs of a site with which they have a research or teaching interest or which may be local to where they live or work.

As described above, geoconservation is a growing activity, with more participants and a greater profile now than ever before. Geoconservation is very well established in the UK and increasingly across Europe and Australia, and with the World Heritage List and especially the rapid growth of Geoparks, it is now coming to prominence in many other parts of the world. In addition to the international frameworks there are many national level geoconservation initiatives. These include establishment and use of conservation legislation and government policy to conserve geological and geomorphological features, processes, sites and specimens and to create geological reserves or parks. There are also many geoconservation activities and projects led by geological societies, associations, academic organizations, museums and geological surveys. At a local level, planning authorities and very importantly, voluntary geoconservation groups such as the RIGS movement, are playing a critical role in bringing geoconservation to local people. In the UK, this has been achieved through LGAP partnerships and increasingly through RIGS regional partnerships, Geopark events and Scottish geology week.

The geoconservation activity described above is now established in many places across the world. It started in different places at different times and in different ways and now involves many people from a variety of backgrounds including Earth scientists, conservationists, land managers and landowners. It has a significant role to play in helping to deliver sustainable development through conserving and promoting scientifically, educationally, recreationally and culturally important features, sites and specimens, many of which are important to an individual region or country's economic wealth and cultural identity (Webber *et al.* 2006).

The origins of geoconservation?

Although it may be desirable to identify when and where geoconservation first began, the inevitable range of opinions over which historic activities were, or were not examples of geoconservation, mean that the origin of geoconservation is likely

to be a subject of debate, rather than a consensus, for some years to come. One aim of this book is to provide some context and observations on this subject to help take thinking forward. It is argued here that it is relatively easy to identify a series of activities that definitely are geoconservation and a further series of activities that definitely are not (Table 1). The challenge lies in the fact that there are also a number of activities that may or may not be geoconservation. Taking the definition of geoconservation given above, namely 'action taken with the intent of conserving and enhancing geological and geomorphological features, processes, sites and specimens for the future, and generally involving awareness raising activity in support of this aim' it is possible to explore the origins of geoconservation further.

Experience in the UK suggests that geoconservation and the stages leading up to it can be divided into a number of steps (Table 1). First and foremost an understanding of the conservation issue must be engendered. You cannot undertake conservation without first having an appreciation of the value of the item to be conserved. Thus, although not directly geoconservation, some of the steps listed, such as building an awareness of geological/geomorphological features, processes, sites and specimens, describing and auditing them and developing an appreciation of them are clearly not examples of geoconservation as they are carried out without intent to conserve. Other steps, including conservation audits such as the Geological Conservation Review (GCR) or the Welsh Assembly Government RIGS audit, use of

Table 1. *What is geoconservation? Geoconservation and the steps leading up to it*

Activity relating to geological/geomorphological features, processes, sites and specimens	Examples of activity	Comments
Initial awareness	Appreciation that geological/geomorphological features, processes, sites and specimens exist	Not geoconservation—just awareness of natural environment or heritage/culture
Examination, description, scientific audit	Specimen collecting for curiosity, visiting and describing features, sites etc., geological mapping/survey	Not geoconservation—collecting and scientific description. Classification and taxonomy start of scientific thinking
Value/appreciation	Retaining specimens, telling others about features, sites etc., drawing and painting of features, sites etc.	Not geoconservation—but a subconscious state likely to result in support of conservation if a threat is perceived
Awareness of threat/perceived threat	Concern and desire to act	Not geoconservation—but likely to be followed by geoconservation
Unintentional or coincidental activity that leads to a geoconservation benefit	Conservation of valued woodland, including a geological feature that coincidentally benefits from conservation of the woodland	Geoconservation ? 'Grey area' No intent here, likely area for debate
Conservation audit	An assessment of what is important to keep and where it is e.g. the GCR	Geoconservation—action to identifying conservation priorities
Protection through legal/policy means	Conservation legislation or National Park/planning policy	Geoconservation—action to protect through law or practice
Management	Purchase of land or specimen, creation of reserve, securing of a site, enhancement of an exposure	Geoconservation—direct action to protect or manage
Awareness raising of importance of feature	Interpretation, books, media, lobbying of politicians, education, involvement of local community	Geoconservation—indirect action to build support for conservation
Development of a holistic approach to conservation showing the interdependence of all aspects of nature	Integrated landscape scale approaches, integrated biodiversity/geodiversity/landscape/archaeology conservation	Geoconservation—as part of a strategic, holistic and integrated approach to managing the natural environment

conservation legislation and policies, creation of geological reserves, on-site management work and raising of awareness to generate support, are all examples of geoconservation, as they are actions carried out with the intent to conserve. These are direct and explicit. However, there is a 'grey area' where actions may or may not be geoconservation. This includes 'unconscious' or 'coincidental' actions that may lead to geoconservation taking place. In Table 1, this 'grey area' lies somewhere between 'valuing/appreciating' and 'taking conscious action'. The 'unconscious' action could be buying a site or specimen because it appeals, but without realizing that it is the geological character of the site or specimen that appeals and that through buying it and looking after it, it will be retained for the future whether by an individual or institution. The 'coincidental' action may be through conservation action taken to benefit a different valued feature, such as a wilderness or woodland. Here, action taken to conserve the coastal cliff for bird sanctuary, wilderness or woodland, could result in totally unintentional conservation benefits for geological features such as an exposure of a mineral vein. The debate about the origins of geoconservation revolves around perceptions of these 'unconscious' or 'coincidental' actions.

The discussion of when geoconservation began is taken up by **Doughty, Thomas & Warren, Worton** and **Erikstad**. **Doughty** uses the Giant's Causeway in Northern Ireland and Yosemite National Park in the USA, to explore the interface between geoconservation and curiosity in the natural world, art, literature, tourism and wilderness. The paper also makes the case for considering geological specimens and collections in addition to sites, when seeking to identify the origins of geoconservation. Another key factor that has influenced when, where and how geoconservation came about is land ownership. Conservation is always easier where the land in question is under the control of those wishing to see conservation taking place. **Thomas & Warren** compare and contrast the development of geoconservation and conservation more widely in the USA and the UK. Differing approaches and geoconservation histories are attributed to a large extent, to different situations in terms of ownership of land. The paper demonstrates that National Parks and conservation areas are much easier to establish where large areas of land are under 'state' control, as in the USA, than where land is largely under private ownership, as in the UK. This historical comparison accounts for the present situation where geoconservation in the USA is based on National Parks, whereas in the UK it is based on the Sites of Special Scientific Interest (SSSI) and the RIGS framework where land remains within private ownership. The local community approach is taken up by **Worton** who uses the seventeenth century observations of Dud Dudley from Dudley as an example, illustrating that the importance of recognizing local contributions in the origins of geoconservation is vital. **Sharples & Houshold** demonstrate the growth of geoconservation in Tasmania, Australia and question the problems of conserving wilderness.

The impact of tourism increasing awareness of 'place' is another strand explored in the origins of geoconservation and developed by **Hose**, **Doughty**, and **Parkes**.

In terms of advocating the earliest examples of geoconservation, **Thomas & Warren** propose Hutton's Rock, Holyrood Park, Edinburgh, from 1845 and **Erikstad**, investigating geoconservation in Europe, identifies show caves as the pioneers of geoconservation. He cites Baumannshole, a cave in Germany, which was subject to a nature conservation decree as far back as 1668.

The development of geoconservation

Having explored the origins of geoconservation, the rest of this book is devoted to the history of geoconservation concepts, the development of geoconservation in the UK followed by experience from elsewhere in the world, especially Europe and Tasmania, and finally looks at the history of global initiatives such as the World Heritage Site series. There are many other ways of analysing the history of geoconservation, two of which are briefly discussed below.

The key players

Geoconservation would never have happened without those who advocated and got involved in making it happen. The strength of the discipline today and the opportunities that are available are a consequence of the vision, belief, action and hard work of those that went before. These papers highlight the critical roles that have been played by so many individuals, communities, societies, associations, groups, organizations, governments, landowners and business interests. They illustrate the range of obstacles that have had to be overcome and the innovative solutions and ideas that have moved geoconservation foward. Importantly, they illustrate that geoconservation had developed in many parts of the world, at local, regional, national and international level, through the efforts of geologists, conservationists, politicians, landowners and members of the public.

At the local and regional level, the work of local communities (**Worton**) natural history societies (**Burek**), RIGS groups and Geology Trusts

(**Burek and Radley**) museums (**Munt**; **Radley**), cave owners, managers and enthusiasts (**Erikstad; Murphy**) and private companies and local authorities (**Doyle**) is vital. Geoconservation is only really effective with local buy-in, and local buy-in can only be secured by local champions and local action. Throughout the history of geoconservation, local action has provided examples of good practice that have been picked up and disseminated at national and international level (**Prosser & Larwood**; **Sharples & Houshold**; **Worton**).

Action at a national level has been essential in providing a robust framework in which local delivery can take place. National surveys such as the map making of the British Geological Survey (BGS) (**McMillan**) and the GCR (**Ellis**) have provided the consistent geological information upon which geoconservation is built. National legislation and policy, implemented by national conservation agencies has provided a robust framework for protecting and managing sites and in declaring and managing National Nature Reserves (NNRs) and National Parks (**Prosser**, **Parkes**, **Thomas & Warren**). National societies such as the Geologists Association (**Green**) and 'umbrella groups' such as UKRIGS (**Burek**) have played important roles in co-ordinating and supporting the local activities of their member groups working locally.

International initiatives such as Geoparks (**Jones**), World Heritage Sites (**Boylan**) and those led by ProGEO (**Erikstad**), have all helped to ensure that the best of our geological heritage is considered at an international level and that geoconservation has an international profile and is supported by a community of interest.

The success of geoconservation has been attributable to many individuals and bodies, working at all levels. There is no reason to believe that the future of geoconservation will not depend on the same wide range of key players, working wherever there is a need or opportunity for geoconservation, to meet challenges similar to those that have been faced in the past.

The practice of geoconservation

As illustrated in Table 1, there are a number of different activities and stages which make up geoconservation and the stages leading up to it (**Doughty**; **Thomas & Warren**). The concepts which underpin aspects of geoconservation such as geodiversity (**Gray**) and geotourism (**Hose**) are addressed. The basic foundation for geoconservation, geological audit and mapping is described by **McMillan**, and **Boylan**, **Burek**, **Ellis** and **Prosser** consider the history of conservation audits used to underpin a range of designations. The history of protection and management of geological and geomorphological features, processes, sites and specimens is described in each paper whilst the history of activity to promote geology and geoconservation is central to papers by **Hose**, **Green**, **Burek**, **Burek**, **Munt**, **Doyle**, **Sharples & Houshold**, **Jones** and **Boylan**.

Conclusion

This book shows that geoconservation has reached a point where there is enough history to look back and learn from. It also provides answers as to where geoconservation came from and why things are as they are today. Geoconservation is a relatively young discipline and one that can learn from approaches to conservation adopted in archaeological, biological and heritage fields. This book demonstrates that the history of geoconservation has been a series of challenges, set-backs and successes; the future is likely to be the same. Most importantly, this book enables us to share the experience of the past and use this to provide a basis for taking geoconservation forward to meet the challenges of the future. The price for not learning this is high and we owe it to future generations to aim for successful geoconservation.

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