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Geoparks: Celebrating Earth heritage, sustaining local communities

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For too long Earth Science has been the poor relative to Natural Sciences when it comes to conservation, preservation and public promotion. Today, however, in 25 territories across Europe, a combination of Earth Scientists, economists, professional marketers and local people are working together to promote the geological heritage of their areas. These European Geoparks not only advance the protection of their geological heritage but they also use it, in a truly sustainable way, to promote the economic well-being of the people who live there. With the full endorsement of UNESCO, this concept of geoparks is spreading to other parts of the world and is rapidly developing into a global concept. This article looks in detail at the geopark idea — exactly what geoparks are, how they function, and what benefits they can bring both to geology and to the public.

Figure 1 The Giant's Causeway, Ireland. Columnar basalt that has intrigued locals and visitors alike for many generations.

Today, at the start of the 21st century, we, as geoscientists, can look back over a century that has seen enormous advances in our understanding of how our planet functions. While we might still not be able to predict exactly when an earthquake will happen or exactly when a volcano will erupt, we know why these phenomena occur. We know how and why mountain ranges are formed and we know how the very face of our planet changes over millions of years as the tectonic plates of the Earth's crust continue their relentless move over the surface of the planet. But it wasn't always like this. For centuries, people had no clear understanding of Earth processes. In Ireland, the hexagonal columns of basalt that make up the Giant's Causeway were considered to be the result of the work of Fionn Mac Cumhail, one of the most famous figures in Irish mythology (Figure 1). Fionn is said to have built the causeway in an attempt to launch a surprise attack on his rival just across the sea in Scotland. Similarly, the great Icelandic volcano Hekla was considered by the early Viking settlers to be the gateway to Hell. How else could such a mountain spew fire and ash? In Greek mythology, Gaea, Mother Earth, appeared out of Choas and her snowy mountains and green valleys became the living places of the gods and, later, humans. Her children were strange gigantic creatures with the crushing and overwhelming strength of hurricanes, earthquakes and volcanoes. Of course, today, such explanations seem fanciful to many in the scientific community. We, as geoscientists, have explanations for all these phenomena. However, perhaps we should ask ourselves how successful we are at sharing this knowledge with those with no formal geological training? Many people today still ask the same questions our ancestors of long ago asked. Yet, all across our planets we have places where the amazing story of our planet can be told to the non-specialist without the need for the use of the esoteric language so often employed by geoscientists. At the Giant's Causeway it is now possible to learn the real story of the basalt columns – the story of the opening of the North Atlantic and the slow cooling of lava. On Iceland, there is considerable national pride that the nation sits astride an active spreading zone, the very place where new crust is being created.

The small continent of Europe is home to several hundred million people living in over 50 nations and speaking dozens of different languages and dialects. This great melting pot of cultures has made Europe the special place it is today. No less diverse than its cultural heritage is the natural heritage of Europe. From the tundra of northern Scandinavia to the baking heat of southern Spain, the continent is home to many climates and a great diversity of habitats. The geodiversity of Europe is just as complex. The geological heritage of Europe ranges from ancient, stable areas such as the Fennoscandian shield to active plate margins such as those along the Mediterranean basin. Europe's geological, natural and cultural heritages are, however, intimately linked. From earliest times (in human terms!), our patterns of settlement and cultural development have been linked to the continent's geological resources. From the Stone age, through the Bronze Age and Iron Age to the modern eras of Coal, Oil and now Silicon, human development has been intimately linked to Earth resources. We have even named key episodes in the evolution of human society to geological resources. In the past, the many peoples of Europe had a direct, intimate link with the natural environment and its resources. The great coal fields and iron deposits of Britain, France, Germany, Russia and Ukraine gave rise to the industrial revolution which in turn fed a great period of urbanisation in Europe. New nations, and indeed empires, were built on the proceeds obtained by exploiting our geological resource and, unfortunately, these resources too often became coveted by others and too often resulted in war. Gradually, the link between human society and our geological heritage became lost and the relevance of geological sciences to the modern world became less clear.

Now at the dawn of the 21st century, more people are becoming curious about all aspects of our cultural and natural heritages, including our geological heritage, our geodiversity. They want to learn more about it and go and see it for themselves. Local communities

across Europe, and increasingly other parts of the world, are beginning to realise that their geological heritage can provide a source of sustainable economic benefit to their area. Rather than exploit this heritage in the non-renewable fashion of the past, there is an opportunity to manage it in a way that conserves it for the future through the development of geotourism. This form of sustainable economic development has the potential to directly impact on those rural areas that have suffered from economic stagnation or demographic decline. But why should geoscientists be involved in such activities? In simple terms, we have to demonstrate to the wider public the relevance of geological science in the 21st century. We have to re-build the bridge between our knowledge of the Earth, it's history and it's landscape and the total dependence of modern society upon Earth's natural resources, a link that was known to generations past.

It is from this background that the idea of Geoparks developed in 1996. At the 30th International Geological Congress in Beijing, discussions between Nickolas Zouros (Greece) and Guy Martini (France) on ways to simultaneously protect and promote European geological heritage and sustainable local economic development led to the creation of the new geopark concept in which the needs of the communities living in areas of rich geological heritage would be addressed (Martini and Zouros, 2001). By June 2000 representatives of four European territories, which had separately been promoting geological conservation and sustainable development, came together in Greece to discuss their common socio-economic problems (stagnant economic development, high unemployment, rural depopulation and an ageing of the remaining population) and how to address these problems through the protection of geological heritage and the promotion of geological tourism. The result was the signing of a convention declaring the creation of the European Geoparks Network. The purpose of this new designation was to provide a network within which to share information and expertise, and to define common tools in addressing the above objectives (Zouros and Martini, 2003).

In November 2000, the four members of the new network, Réserve Géologique de Haute-Provence (France), Lesvos Petrified Forest (Greece), Maestrazgo Cultural Park (Spain), and Vulkaneifel (Germany) invited interested regions and organisations from across Europe to join them in learning more about geoparks and to apply for membership of the new network. From it's formal beginnings in June 2000, the European Geoparks Network has now expanded from consisting of four member territories to twenty-five members in ten countries (Figure 2). But what actually is a European Geopark? As specified in the Declaration Charter, a European Geopark is not just a collection of geological sites, but is a territory with a particular geological heritage and with a sustainable territorial development strategy (in Frey et al., 2001). It must have clearly defined boundaries and a sufficient area to allow for true territorial economic development, primarily through tourism. Geological sites must be of particular European importance in terms of their scientific quality, rarity, aesthetic appeal and education value. Sites can not only be related to geology but also to archaeology, ecology, history and culture. All these sites in the geopark must be linked in a network and constitute thematic parks with routes, trails and rock sections that can benefit from protection and management measures.

Geoconservation is implicitly expressed within the Charter of the European Geoparks Network through the strong statement that no destruction or sale of geological objects from a European Geopark may be tolerated, except for scientific or educational purposes. Furthermore, a European Geopark has to develop and enhance methods and tools for the preservation and conservation of geological heritage, as well as to support and develop scientific research related

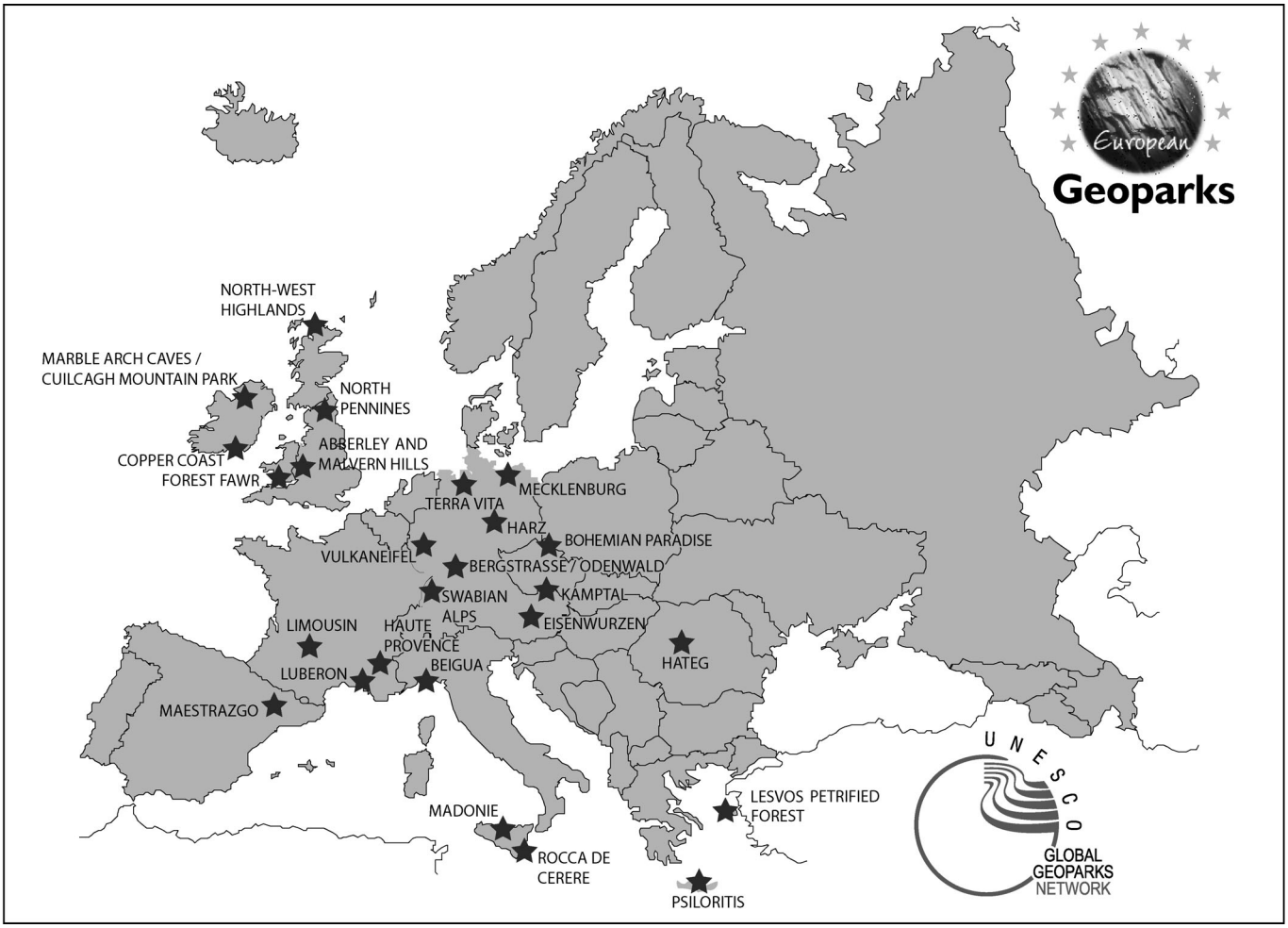

Figure 2 A map showing the location of the 25 members of the European Geoparks Newtork as of October 2005.

to the various disciplines of the Earth Sciences. Education and training on the natural and geological environment comes as a direct consequence of conservation strategies and aims to promote knowledge and value of geological heritage, outlining the concept of geodiversity in the territory. Sustainable development is considered as an essential practice for economic development in the territory and for the strengthening of the management structure and, therefore, for the Geopark itself. Geological heritage is evaluated and considered from the inhabitants' perspective, presence and needs. The contribution of the Geopark is thus seen through the enhancement and promotion of a certain image related to the geological heritage and the development of tourism with related actions. This should have a direct impact on the territory influencing its inhabitants' living conditions and environment, lead to a revalidation of the values of the territory's heritage and enforce active participation to the territory's cultural revitalization as a whole. Finally, a European Geopark has to work within the network for it's further expansion and cohesion, collaborate with other geoparks and local enterprises for the achievement of it's objectives, create and promote new by-products linked with geological and cultural heritage in the spirit of complementarity with the other European Geoparks Network members. Typical activities in a European Geopark include the development of walking and cycling trails, the training of local people to act as guides, education courses, provision of information signage and the development of modern museums and visitor centres (Figure 3). The ultimate aim of a European Geopark is to bring enhanced employment opportunities for the people who live there.

One of the stated aims of the European Geoparks Network is to exchange ideas and expertise on promoting geological awareness and sustainable development. It is with this aim in mind that the members come together three times per year. Twice annually the network meets on its own while on the third occasion the network meets a few days in advance of the annual meeting which is open to everyone, members and non-members alike. These meetings promote the use of common tools such as the website (*www.europeangeoparks.org*), magazines, displays, events but also encourage members to develop exchanges or projects between smaller groups of geoparks. Once a year all members participate in European Geoparks Week (Figure 4). This is a series of coordinated events (guided walks, talks, activities for children, etc. …) which occur in the same week in every member of the network and which is aimed at increasing public awareness about Earth Science issues in general and about building awareness of the European Geoparks Network and our great shared geological heritage. Not only is the public in one geopark informed about activities occurring there, but they are made aware of the fact that they are part of a much wider series of events that will be happening across Europe. One of the key projects that involves members of the network across eight nations is funded by the European Union's INTERREG IIIC fund (Zouros, 2003). The key aim of the project is to strengthen co-operation between members of the network through the creation and application of a common strategy for geological tourism development on a European level. Under the leadership of the Lesvos Petrified Forest (Greece), the project also aims to promote the consciousness and awareness of the public towards the protection of natural heritage and to improve the quality of services offered to tourists. The project also has a fundamental role in the exchange of information, knowledge and good practice between different partners who are working in the same fields with similar goals. Transnational networking and sharing of knowledge will mean new concepts, outputs and results for further integration on spatial planning, transnational environmental problems and development issues. The creation of quality standards for geoparks services and products is one of the key aims of this project. As part of this, an evaluation process has been established that will try to measure the level of quality in infrastructure, services and sustainable management in each member of the network. The process will be repeated every three years to ensure that the level of quality remains of the highest order. An evaluation dossier has been drawn up and the evaluation process occurs in two parts. Firstly, the geopark subject to the evaluation completes a self-evaluation. This is followed by a visit and an evaluation by an independent referee. A geopark which fails to reach a certain quality level in the evaluation process will loose it's membership of the network.

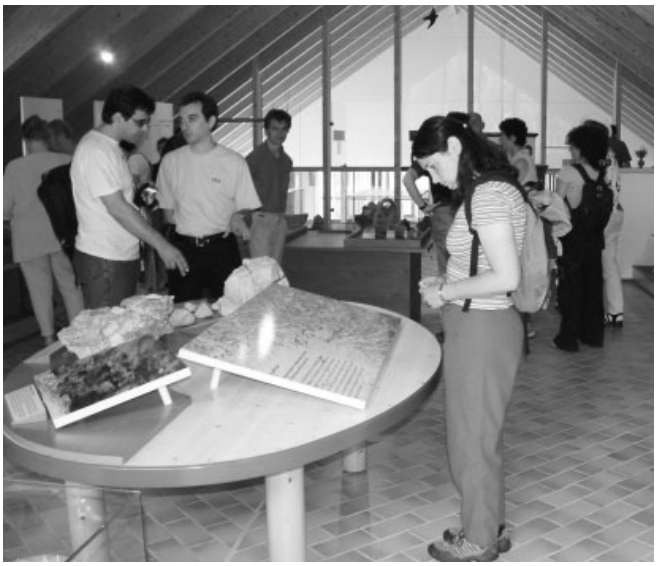

Figure 3 Gams Museum, European Geopark GeoLine Eisenwurzen, Austria — an example of a local community geological museum informing locals and visitors about the region's rich geological heritage as well as providing jobs for local people.

Figure 4 European Geoparks Week comprises a week of coordination of public outreach activities across all members' territories of the European Geoparks Network. This image shows children examining a dinosaur trackway at the Terra.vita European Geopark, Germany during European Geoparks Week in June 2005.

In north-west Europe, four geoparks have come together as part of a project aimed at developing a sustainable, transnational tourism produced based on these areas' unique geological heritage (Mc Keever, 2004). These European Geoparks are the Copper Coast in County Waterford (Republic of Ireland), Marble Arch Caves in

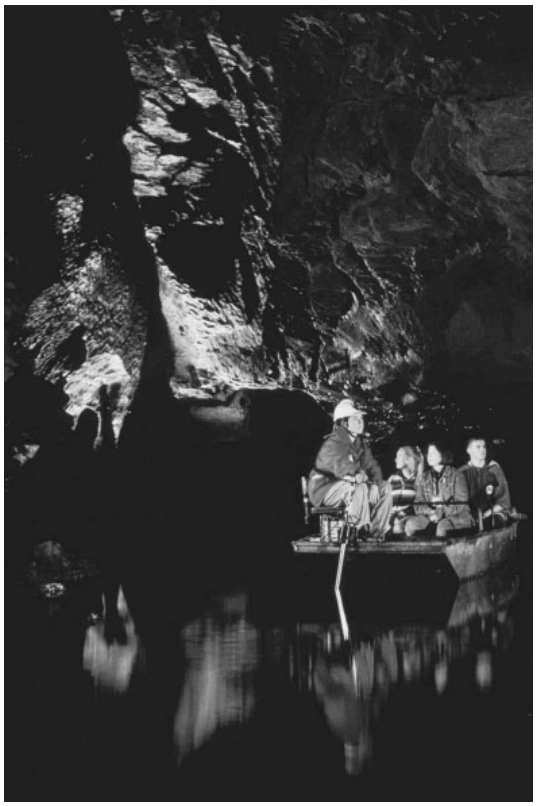

Figure 5 Marble Arch Caves European Geopark, N. Ireland – Ireland's premier showcaves are the focal point of this European Geopark which is helping to revitalise the economy of this isolated part of north-west Ireland.

County Fermanagh (N. Ireland) (Figure 5) and the Vulkaneifel and Bergstraße-Odenwald (both in Germany). Each area is located in an area that is either economically or socially disadvantaged or has been by-passed by the mainstream tourism industry. Each area has separately identified that sustainable exploitation of their geological heritage might be one way of helping address these matters. These four geoparks have teamed up with other partners under the leadership of the Geological Survey of Northern Ireland to implement this major project. The project is funded under the European Union's INTERREG IIIB (north-west Europe) funding programme and it's main objectives are to protect and promote the shared geodiversity of north-west Europe to the wider public and to use north-west Europe's rich geodiversity to bring sustainable economic development to the region. To realise these issues the project partners have formed a transnational forum of exchange and communication to prepare common products and to work on standardising tourism products in the broadest sense. The spirit of this exchange and transnational cooperation will be visible throughout the four geoparks, from each territory's visitor centres through to territory-specific products. All products will display the UNESCO-endorsed European Geoparks Network branding thereby helping to contribute to the building of a high-quality, transnational tourism product that will be readily identifiable between regions and nations, not just in north-west Europe but also across the wider European Union.

One of the key early successes for the European Geoparks Network was the signing of an official agreement of collaboration with UNESCO (the then Division of Earth Sciences) in April 2001 which placed the new network under the auspices of UNESCO, thereby confirming the network's important contributions to conservation and sustainable development issues in Europe (*in* Zouros et. al., 2003). Since then, UNESCO has played an important role in the development of the European Geoparks Network and has used the European model as the one to follow as they roll out their Global Network of Geoparks (Eder, 2004). At a meeting in UNESCO headquarters in Paris in February 2004, representatives from the scientific board of the International Geoscience Programme, the International Geographical Union and the International Union of Geological Sciences along with international experts on geological heritage, conservation and promotion agreed to the establishment of a "Global Network of Geoparks under the auspices of UNESCO." Three goals were established for the new global network, i.e. conserving a healthy environment, education about Earth Sciences to the wider public and fostering sustainable local economic development. Initially the new Global Network comprised all members of the European Geoparks Network as well as 8 members of the National Geoparks Network of the People's Republic of China. Members of the new Global Network got together for the first time at the inaugural International Conference on Geoparks that was held in Beijing in June 2004 (Figure 6). At that meeting, interested parties from all corners of the globe came to find out exactly what the geopark concept was about and to exchange their ideas and views. The conference culminated in acceptance of a declaration on the protection of the geological heritage of the world. This "Beijing Declaration" aims to promote and stimulate the further expansion of the geopark concept across the globe (Organising Committee of the 1st Inertnational Conference on Geoparks, Beijing 2004). It was also at the Beijing meeting that the European and Chinese members of the Global Network agreed to a "twinning" process whereby one geopark in China twins, or partners, with a geopark in Europe to foster co-operation and to lead to a process of exchange of experience, personnel, knowledge and information. In February 2005, a further four Chinese geoparks were admitted into the Global Network. Interest is also growing in many other parts of the world including Mexico, Iran, Morocco and Zambia. The level of collaboration between UNESCO and the European Geoparks Network was enhanced in October 2004 with the signing of a further agreement, the so-called "Madonie Declaration," signed at the Madonie European Geopark, Sicily, Italy (Eder and Zouros, 2004) (Figure 7). This declaration confirms the previous agreement of cooperation between the two organisations and affirms that any European territory wishing to become a member of the UNESCO Global Network of Geoparks can only do so by joining the European Geoparks Network. Should that territory later lose it's designation as a European Geopark (for example, through the afore-mentioned evaluation process) then it automatically loses it's membership of the Global Network also.

This year, the European Geoparks Network marks it's fifth birthday. Along with partners in other organisations such as UNESCO, it has and continues to help redress the great imbalance in

Figure 6 The First International Conference on Geoparks in Beijing, June 2004 saw the first formal twinning between members of the Global Geoparks Network when an agreement was signed between the Marble Arch Caves (N. Ireland) and Haute Provence (France) European Geoparks and the Zhangjiajie National Geopark in China.

Figure 7 The signing in Sicily, Italy, of the "Madonie Declaration," the latest formal agreement between UNESCO and the European Geoparks Network.

natural heritage issues in Europe between ecological and geological topics. It has helped raise awareness of Earth Science issues at the local, regional, national and transnational level. It has been asked to nominate members to new global initiatives created by IUGS and IGU such as the IGU Geoparks Taskforce. Perhaps most significantly it has, and continues to succeed, in creating jobs within disadvantaged areas through the sustainable use of our geological heritage. The network continues to expand, drawing in new expertise and knowledge from all parts of Europe. Many new membership applications are pending and members from across the network are assisting these territories in their membership bids to ensure the overall high quality of services the network insists on is maintained. The network is still young and the coming years will continue to be one of great challenge. With our partners in the Global Network of Geoparks, the European Geoparks Network will continue to assist UNESCO in bringing the geopark concept to all parts of the world, especially to the developing world where sustainable tourism, such as that developed within geoparks, could lead to job creation in local rural communities for the benefit of those communities. For more information on geoparks why not look at *www.europeangeoparks.org* or contact the coordination unit at *sy.giraud@free.fr*. An important date for your diary is the Second International Conference on Geoparks which will be held in Belfast (N. Ireland) from September 17–21, 2006 (*www.geoparks2006.com* or contact *info@geoparks2006.com*).

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