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Iconic Sites for Alpine Geology and Geomorphology

Rediscovering Heritage?

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Iconic Sites for Alpine Geology and Geomorphology

Rediscovering Heritage?

Emmanuel Reynard, Fabien Hobléa, Nathalie Cayla and Christophe Gauchon

- 1 Throughout the nineteenth century, the geology of the Alps provided the focus for the numerous scientists active in the region in the wake of the accounts produced by the first modern travellers in the mountains. Such natural philosophers struggled to unravel the complex processes of Alpine tectonics; while, at the same time, research into the ancient extent of glaciation in the region demonstrated the importance of the Alpine massif to understanding global climate history. Associated with the popularity of certain “picturesque” Alpine sites among aristocratic tourists and with the earliest large-scale quarrying, this double preoccupation – for alpine orogeny and for the glacial history – gave rise to the first wave of established geological and geomorphological heritage sites during the second half of the nineteenth century. This interest in abiotic natural phenomena subsequently lessened, replaced by the movement for the protection of a nature predicated overwhelmingly on its biological components.
- 2 Over the last twenty-odd years, however, we have witnessed a renewed vigour in the establishing of geological and geomorphological heritage sites, a vigour underlined internationally by the inscription of numerous geological locations as Global Heritage Sites, by the development of a network of European Geoparks and by programmes of large-scale improvement and promotion, such as the Via GeoAlpina. Nor has action at the local scale been less energetic, marked by the proliferation of heritage initiatives involving a wide range of protagonists drawn from both institutions and civil society.
- 3 Let us to begin by examining these developments diachronically through an analysis of the historical development of the heritage status of certain specific sites. This will enable the demonstration of what constitute the significant signposts in the process of establishing the heritage status of sites. Then as a second step, we shall focus more closely on the contemporary renewal of the heritage process so as to show that rather than it constituting the emergence of new heritage sites, it consists in new forms of heritage

creation. Finally we will show that geoheritage can produce new territorial resources for Alpine valleys.

From “picturesque” to “geoheritage”: the history of geoheritage in a few emblematic sites

- 4 What will be described here are the “heritage-creation itineraries” (“itinéraires de patrimonialisation” (Gauchon, 2002)) or the “heritage trajectories” (“trajectoires patrimoniales” (Portal, 2010)) of a small number of emblematic geosites in the Alps. The aim is to identify the chief stages of the process that led to those sites acquiring heritage status – i.e. to their being recognized as representing a heritage value to society – and even to their losing that heritage status (“dépatrimonialisation” (Gauchon, 2002)) and then regaining it. Our study will focus on three specific cases: erratic blocks in Switzerland, caves and canyons in France and two paleontological sites in Italy and France.

Erratic blocks in Switzerland: a conserving sacralization

- 5 Scattered over virtually all of Switzerland by the great glaciers of the Quaternary, erratic blocks gave rise during the first half of the nineteenth century to lively scientific controversy about their origins (Schaer, 2000). It was, paradoxically, only after those origins had been firmly established as being caused by glaciation, around 1835, that such blocks began to be exploited commercially for the needs of construction in Switzerland’s then expanding urban regions. In response to the rapid disappearance of what was at the time considered to be the principal indicator of ancient glaciation, the geological community mobilized so as to protect some of the threatened blocks (Reynard, 2004). The movement was led by the geologists Alphonse Favre and Bernhard Studer, who in 1867 published their *Appel aux Suisses pour les engager à conserver les blocs erratiques* (Call to the Swiss to Join in the Conservation of Erratic Blocks). Their appeal provoked considerable enthusiasm for the cause throughout the country and various forces (scientific societies, government authorities, schools, etc.) mobilized to carry out inventories, draw up maps and, eventually, to place some of the blocks under protection – often by purchasing them or bequeathing them to associations or museums (Reynard, 2004).
- 6 This first wave of heritage undertakings was to be renewed between 1905 and 1908 by the campaign to save the *Pierre des Marmettes* (Monthey) (fig. 1), the largest erratic block in Switzerland, which was situated on private property and was earmarked for quarrying. Again it was the commitment of the geological community – through the support of public bodies and the raising of a national subscription – that allowed the block’s purchase and then bequeathing to the Swiss Natural Sciences Society (Reynard, 2004). These blocks were forgotten during the twentieth century, only to be rediscovered during the course of the establishment of the National Inventory of Geosites (1996), or through initiatives such as the “Living Geology Days”, organized nationally since 2007 to promote geosciences among the general public.

Fig. 1. The *Pierre des Marmettes* (Monthey), the largest erratic block in Switzerland. The block has been “saved” from destruction between 1905 and 1908. He is currently the property of the Swiss Academy of Sciences (SCNAT) and is situated in the parking of Monthey hospital.



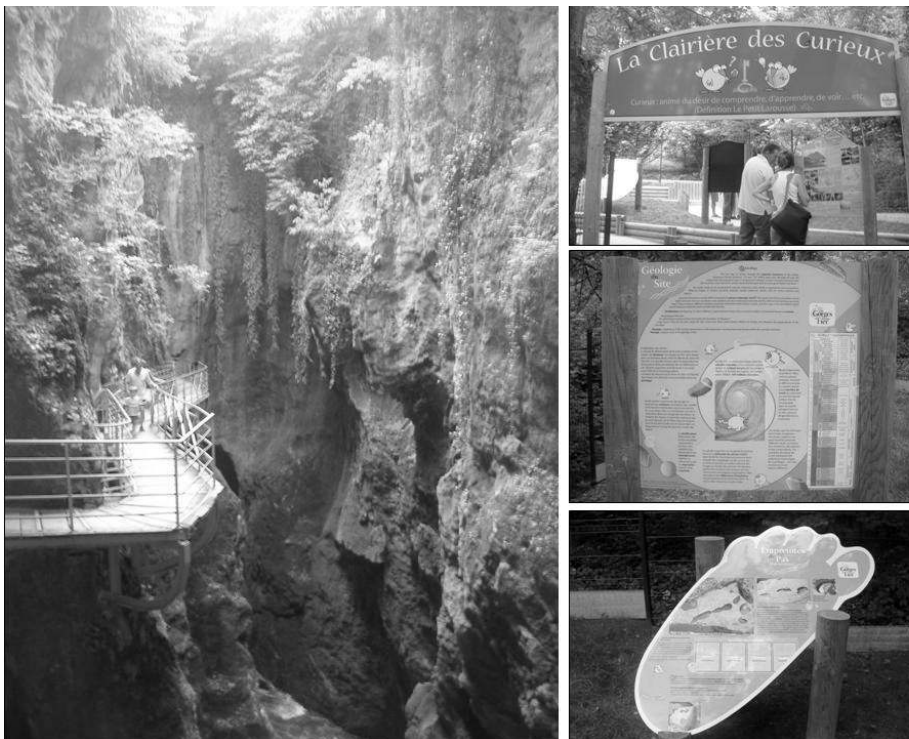
Photo: E. Reynard.

The heritage status of caves and canyons in France: initially driven by economic and cultural considerations

- 7 Karstic forms and phenomena produce some of the world's most characteristic and unusual landscapes. Following the precepts established by C. Gauchon's doctoral thesis (1997), the histories of several heritage-significant karstic cavities were researched. This demonstrated that strong interactions existed between tourism development at the sites and their heritage status (Aven d'Orgnac (Ardèche), Biot & al., 2007; Choranche Cave (Vercors), Gauchon & al., 2006).
- 8 For our part, we will examine the heritage histories of some less well-known canyons in the pre-alps and peri-alps of the Savoie, using as examples the Fier Gorge (near Annecy) (fig. 2), the Pont du Diable Gorge (Chablais) et the Sierroz Gorge (near Aix-les-Bains). Because of their steepness and narrowness and of the turbulent acceleration of the waters running through them, these constitute eminently spectacular sites and are dangerous to enter unless they are appropriately equipped (walkways). In contrast to the erratic blocks of Switzerland, their heritage status owes nothing to any intrinsic scientific value. It is due rather to their picturesque appeal, first mentioned in travel narratives and then taken up by nineteenth-century guidebooks. Tourist activity (from 1800 for Sierroz, 1869 for Fier and 1893 for Pont du Diable) preceded and prepared the way for institutional heritage status (1908 for the Pont du Diable Gorge (listed site), 1910 for Sierroz (listed site), 1943 for Fier (registered site). Thus, the heritage process applied to sites that were already extensively equipped, famous and popular and were presented in terms of being "national monuments". Nor did the process hinder their cultural appropriation: as for example occurred in the Sierroz gorge – at the time a tourist attraction associated with neighbouring the baths of Aix-les-Bains – when on 10 June 1813, Adèle Baroness de Broc,

one of Queen Hortensia's young ladies-in-waiting, accidentally drowned there as the queen looked on. The story of the tragedy, widely reported at the time, rapidly rendered the site an obligatory stop for Romantic tourists (Pomini, 2008). The cultural dimension of other geosites grew up through analogous events (Panizza & Piacente, 2003); and today constitutes, as it were, added value to listed sites (Reynard, 2005). The example of the Sierroz Gorge also shows how the achievement of institutional heritage status is not necessarily enough in itself to guarantee the perpetuation of the site's use: in 1980, the obsolescence of its infrastructures caused it to be closed to the public.

Fig. 2 The site of Fier Gorges (Lovagny, Haute-Savoie). Left, a view of the canyon equipped with a pathway for the tourist visit. Right, the "Clairière des curieux" is an interpretation area developed in 2009. Its preparation has involved the private operator, students and university professors, professionals of scientific interpretation, and specialists of open-air stage design and it opens the site to a new geotourist dimension.



Photos: F. Hobléa.

- 9 From these examples, it can be seen that initial protection measures and added cultural value combine to produce the tourism development of sites. Naturalist scientific interpretation follows only later, usually in a marginal way, to reinforce a pre-existent product (table 1).

Paleontological sites protected by their development for tourism

- 10 Fossil-rich sites have long owned a significant place within the culture of geology. Fossils enable the establishment of a relative chronology for geological events and lie at the basis of evolutionary theory. We are currently witnessing an acceleration of the process of according heritage status to certain such sites. Here are two case studies:
- 11 Situated some twenty-five km to the north of Verona, the Monte Purga di Bolca presents an exceptional concentration of fossils dating back 46 million years. Leonard da Vinci

(1452-1519) was one of the very first to describe petrified fish discovered here. Girolamo Fracastoro (1478-1553) surmised that these “marvellous stones” constituted the remains of ancient marine organisms (Gaudant, 1997). The commercial extraction of specimens began relatively early on. In 1817, the Cerato family obtained the right to exploit the site from the Antonio the Marquis Maffei, renting the site from him. Later, they purchased the site and went on to “invent” the profession of fossil quarrying. This institution as a commercial activity had the advantage of considerably limiting uncontrolled extraction, it continues moreover to this day – as a means of the sustainable development of the resource – and a new quarrying site was recently inaugurated. More than forty thousand visitors are drawn to the site every year and an information centre managed by the Lessine Regional Nature Park has been opened to increase its attractiveness to visitors. In this case then, more than five hundred years elapsed between the original discovery and scientific investigation of the fossil vein and the institutional process leading to its acquiring heritage status, followed rapidly by its development for tourism.

- 12 The Balme Cave at Collomb in the Chartreuse Regional Natural Park, is visited by thousands of tourists every year because it is located on the route that leads to the summit of Mont Granier. In 1998, a cave mouth, obstructed by a landslide, was discovered. Once the blockage removed, and the interior of the cave revealed, a deposit of cave bear remains, extending over some 3,000m² was discovered. Subsequent excavation and extraction produced nearly 12,000 bones, indicating that the cave had been occupied over a period extending from 45,000 to 24,000 BP. Aware of the extraordinary significance of the find, local authorities immediately undertook the administrative protection of the site and, following that, organized its development as a tourist attraction. Thus the Chartreuse Cave Bear Museum, located in a village at the foot of the Granier Massif, opened to the public in 2002 (fig. 3). It hosts some 22,000 visitors a year, whereas the cave itself is only rarely open to the public in order to ensure its conservation.

Fig. 3. Reconstituted cave bear skeleton, exposed at the Bear Cave Museum in Chartreuse.

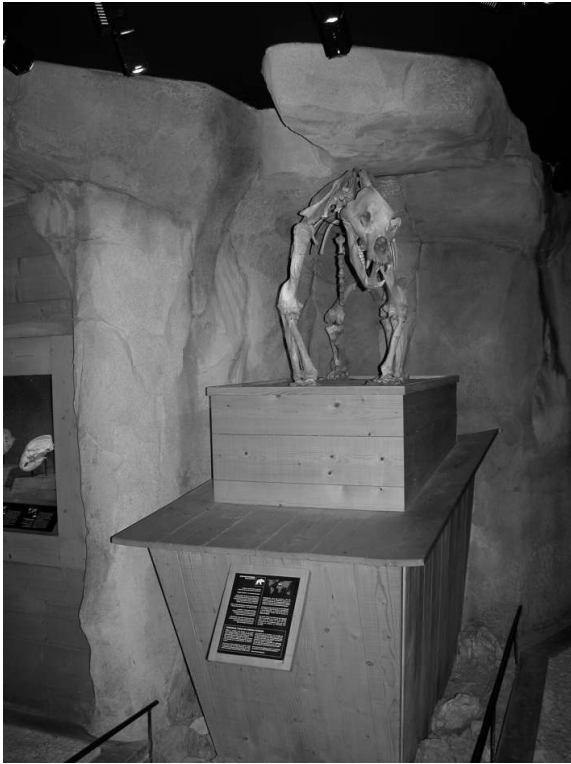


Photo: N. Cayla.

Table 1 – Heritage history of some Alpine geosites (F/T: F = First Steps; T = Tourism Development; I: Institutional heritage status: by listing (maximum intensity) or registration (intermediate intensity); V = recent geotourism improvements and promotion).

	1800	1825	1850	1875	1900	1925	1950	1975	2000
Sierroz Gorge (Aix-les-Bains, Savoie, France)									
F/T									Lost to tourism
I				1910					
V									
Pont du Diable Gorge (Chablais, Haute-Savoie, France)									
F/T				1893					
I				1908					
V								2008	
Fier Gorge (nr. Annecy, Haute-Savoie, France)									
F/T		1869							

I						1943			
V								2009	
Pierre des Marmettes (erratic block, Monthey)									
F/T		1867							
I				1908					
V								2010	
Monte Burga di Bolca Quarry									
F/T	1817								
I									
V									
Balme Cave at Collomb									
F/T							1988		
I									
V								2002	

Emergence or resurgence?

- 13 Comparative analysis of the heritage trajectories of these exemplary Alpine sites (table 1) reveals a relatively old and evolving heritage process of which the current wave of activity is but a part. In this regard, one can speak of heritage renewal in the case of the Swiss erratic blocks, or even of heritage resurrection at some sites. The case constitutes a very early process of heritage institutionalization (end of the nineteenth century), despite the fact that the first legislative measures for natural protection date from only 1966. Indeed the story of the erratic blocks is essentially predicated on objectives concerning their protection, whereas their cultural and heritage enrichment have only gained importance during the last decade. The examples provided by the canyons of Savoie on the other hand show how identical forms can generate completely different heritage histories, as these are frequently predicated on outside contingencies (proximity to a tourist or urban centre, natural hazard, etc.). The Savoie sites are exemplary of first wave of heritage creation (up to the first half of the twentieth century). More often than not, these were driven by tourism-related factors based on considerations of the aesthetic and picturesque aspects of the sites in question (Gauchon, 2002; Portal, 2010). Finally, the case of the paleontological sites demonstrates the subtle balance between a commitment to conserve and a desire to optimize the exploitation that exists at many geological sites.

- 14 Most of the sites presented here, along with many other alpine geological and geomorphological sites, have benefitted in recent years from significant interest in heritage issues. This is cognate with the development of a new type of heritage site over the last twenty-odd years: an official heritage category within that of the general class of natural heritage sites that recognizes the value of remarkable geological and geomorphological objects (geotopes, geosites, geoheritage sites). This collective recognition bears witness to a new awareness of the importance of the role played by landforms and geological structure, both in the ecosystem – which remains central – and in our daily experience of interaction with the natural world.
- 15 Thus, whereas the spectacular and aesthetic aspects of sites (the “picturesque” that for so long dominated in decisions concerning the heritage status of abiotic sites) have been relegated to the rank of “ancillary value” (even if these are the ones frequently emphasized when it comes to promoting the sites, especially for tourist purposes), it is now those intrinsic characteristics of landforms and geological structures illustrative of Earth history and climate and biological evolution, coordinated within a “scientific” perspective, that are put forward as the principal justification in the present wave of heritage undertakings (Grandgirard, 1997; Reynard *& al.*, 2009).

Geoheritage sites: an innovative concept for innovative realities

- 16 The term “geoheritage” denotes those abiotic constituents of the planet that are subject to the administrative establishment of heritage status (collective recognition, protection, infrastructural improvement). The term designates those geological areas needful of preservation because of their scientific, cultural and aesthetic values and is relative to issues of geodiversity (Gray, 2004), geoconservation (Bureck & Proser, 2008) and of geotourism (Newsome & Dowling, 2006). The community of European geoscientists organized itself during the nineteen nineties to be able to lobby effectively. This resulted in the objectives of geoconservation being incorporated in relevant legislation. During the same period, the promotion of geoheritage among the various strands of society gave rise to numerous innovative actions and initiatives that stand as markers of this latest wave of heritage undertakings. Initiated more-often-than-not by geoscientists, such projects have been widely taken up by territorial protagonists and decision makers and adapted to the socio-cultural specificities of the various Alpine countries.

New markers of the heritage process: from local initiatives to international recognition

- 17 It is impossible to list here all the geoheritage initiatives undertaken across the international scale of the entire Alpine range (Cayla, 2009). Suffice it to mention a few of the trends corroborative of the idea that an underlying, non-cyclical movement indeed exists across the whole Alpine territory – though one presenting variations. Over the last few years, a number of sites have been accorded World Heritage status on the basis of their paleontological (Monte San Giorgio), tectonic (Sardona) and geomorphological (Jungfrau-Aletsch, Dolomites) value. In the case of the last of these, it was the site’s geomorphological diversity (Panizza, 2009) that constituted the principal argument

leading to the eventual success of its candidacy; this following an earlier attempt which failed because it was too centred on issues of biological values. All the major Alpine nations, moreover, are currently in the process of drawing up inventories of geosites, the goal of which is the identification of those sites most emblematic of geoheritage (table 2). In the region's federally structured nations, cantonal (Switzerland) or regional (German *Länder*) inventories are also being established. All this activity has to a certain extent allowed the distance by which abiotic heritage has fallen behind its biological equivalent to be made up. In a number of countries (France, Switzerland and Italy, notably) inventories are currently being carried out in existing or planned regional and national parks. It should, however, be noted that these inventories are being produced by the scientific community alone without any official basis in law, nor any funding. This is the case in Switzerland, where, in contrast to many biological objects (marshy, alluvial or dry grassland sites), the abiotic heritage still has no statutory place. In France, on the other hand, a National Inventory of Geological Heritage has been instituted by means of the Proximity Law of February 2002. From 2011, moreover, the legislative and regulatory code for the environment entitled Grenelle II makes provision for prefects to issue geotope protection orders.

- 18 Alongside such initiatives aimed at the identification and conservation of sites, the Alpine region in its entirety has spawned a multitude of geotourism projects (Cayla, 2009), whose goal is explicitly the promotion of knowledge about geoheritage and geoheritage sites through the development of “geotourism products” such as thematic footpaths, signposting, brochures, museums, etc.. Not all of these products meet the highest standards, and the scientific community is currently investigating ways in which a better fit between geoheritage supply and tourist demand may be achieved. Thus the scientific community has begun to operate a certification process for such geoheritage initiatives – as has recently been the case in Canton Valais (Switzerland). Beyond the scope of all these local projects, mention should be made of the Via Geoalpina project (www.viageoalpina.org), whose goal is the development and promotion of all the geological, geomorphological and hydrological heritage present along the route of the Via Alpina from Trieste to Monaco. And recently a number of Geopark projects have been launched in a variety of Alpine regions, some with the aim of joining the European Geopark Network. These will undoubtedly enable the map of Geoparks at the European scale to be properly completed, for it is presently poor as far as mountain parks are concerned.

Table 2 – Principal legislation concerning geoheritage and the inventory of geosites in Alpine nations (website viewed, 18 May 2011).

NATION	GERMANY	AUSTRIA	FRANCE	ITALY	SLOVENIA	SWITZERLAN
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Principal laws	1907 - Natural monuments 1935 - Protected zones 1992 - Inventory of geotopes	Federal Legislation, province by province	1913 - Historic monuments 1930 - Natural Protected zones 1976 - Nature reserves	1909 - Rosadi Law 1919 - Croce Law 1939 - Bottai Law 1985 - Galasso Law	1921 - Protection Law 1924 - Alpine Park 1945 - Heritage	1914 - National Park 1966 - Law for protection of natural landscape (LPN) 2007 - LPN revision
State of geosites inventories	Official and complete	Official and complete	Official and underway	Official and complete	Official and underway	Unofficial, currently revision
Chief implementations	2002 - Earth Day 2000 - 100 Bavarian Geotopes	1999 - Austrian geological service inventory	2002 - SRU law instigating the inventory to be carried out by DREALS	ISTRA heavily involved		Inventory carried the Swiss Academy of Natural Sciences
Internet sites	http://www.lfu.bayern.de	http://www.geologie.ac.at/geo_exkursionen/start.htm	http://inpn.mnhn.fr	http://sgi2.isprambiente.it/geositi/		http://www.geosciences.s

Issues, drivers and roles: the new dispensation aligned to sustainable development

- 19 The current modalities and drivers of heritage initiatives as described above are broadly in accordance with the imperatives of the sustainable-development paradigm applicable to mountain territories –considered to be of priority, pioneer and driving significance according to the Rio Conference’s Agenda 21 (Messerli & Ives, 1997). Alpine geoheritage sites are thus located at the heart of those issues pertinent to developmental activities within mountain territories. At an historical moment in which the skiing industry is under question, threatened as it is, particularly at mid-altitude, by commercial and climatic uncertainty, geoheritage sites occupy a privileged place within the range of available diversification and seasonal redistribution tools.
- 20 In this regard, the case of the listing process concerning the Choranche Caves and Coulmes Plateau (Vercors Regional Nature Park, France), initiated in 2005 by the French Environment Ministry, is a good indication of the kinds of territorial difficulties that may confront heritage initiatives (Hobléa & *al.*, 2008). Because of stiff opposition from an influential sector of local opinion – among which numbered local landowners affected by the listing – the French state at length abandoned the project on the grounds that forcing

the issue would be at odds with that governing principle of sustainable development which insists that the opinions and free assent of local populations should be respected.

- 21 With the boot on the other foot, (geo)heritage arguments can be deployed in support of movements opposing certain infrastructure developments and activities (quarrying, transalpine transport lines, etc.) now often viewed as being negative in the context of the sustainable-development paradigm. So it was that at the beginning of the twenty-first century, on the western edge of the Chartreuse PNR and following a highly unfavourable public enquiry informed by lobby groups leveraging geoscience expertise, a proposed quarry situated in the commune of Saint Christophe la Grotte was rejected by the Prefect on the grounds that it threatened the promotion of the Sarde Way and Echelles Cave heritage and tourist site, an important historic and cultural site adjacent to the proposed quarry. The example here demonstrates a clear preference for a new approach to geological resources, one that is far more respectful of the physical and human environment, while still aiming to promote territorial development, albeit in a different way.

Alpine geoheritage serving territories: a win-win strategy

- 22 The example afforded by the Saint Christophe la Grotte quarry project illustrates how the value accorded to quarrying has been inverted. Like geosites, the history of mineral extraction has followed a cyclical trajectory, in which periods of boom and prosperity have been followed by decline and abandonment. While it is the case that most alpine mining sites have today passed from the sphere of industrial resource to that of heritage, the same cannot be said of gravel pits and quarrying. Nevertheless, while this activity was considered only in terms of being a valuable resource until the nineteen-nineties, new installations since have met with the opposition of the majority of local populations and their elected representatives, more concerned with protecting their quality of life and their local landscape. Thus from a logic of exploitation, we seem currently to be passing to a logic predicated on sustainable development, by which the resource is maintained within an environment intact: The idea being to establish a win-win synergy between economic, environmental and social fields.
- 23 This new approach now forms the basis of innovative territorial development strategies that are particularly well adapted to the needs of alpine territories undergoing more-or-less forcible change. The Geoparks concept (Zouros, 2004) is typical of the new approach. The Geopark designation – founded and managed from 2000 on according to strict guidelines by a network of pre-existing areas protected for their geological heritage – is awarded to candidates able to demonstrate their commitment to a genuine territorial project articulated around their geoheritage as a territorial resource. By the end of 2010, four Geoparks were in existence (The Geological Reserve of Haute-Provence and the Lubéron Natural Regional Park in France, the Adamello-Brenta Natural Park in Italy and Eisenwurzen Natural Park in Austria). And the designation would appear to be headed for a successful future given the large number of declared projects emanating from all the countries of the Alpine region.
- 24 In order to achieve its socio-economic development goals, the Geopark concept is betting on the development of a new kind of tourism – geotourism – defined as being an

ensemble of tourism (and leisure) practices and products based on the promotion of local geoheritage elements used as such. This implies a strong synergy between scientists – the producers of the knowledge, methods and tools necessary for the conservation and promotion of these resources – territorial managers and decision makers, planners and cultural and scientific mediators. And even within the scientific community itself, geoheritage requires a multidisciplinary approach, involving not only the geosciences (including physical geographers and geomorphologists) but also the human, economic and social sciences (particularly social and cultural geography). Thus geography finds itself positioned at the crossroads of all these approaches; and we witness in Alpine university faculties, how culturally aware geomorphologists work together with researches issued from the fields of cultural and social geography, or even form that of the geography of risk.

Conclusion

- 25 Without any doubt, the current “heritage proliferation” (Choay, 2006) involves alpine geosites, some of which were initially involved in early heritage initiatives dating back to the nineteenth century. This new wave is characterized by the “scientification” of heritage processes, and has developed its own terminology along with attempts to objectivize and quantify the selection and evaluation procedures for sites involved according scientific values (Reynard & *al.*, 2009). Geology and geomorphology are now the principle criteria of heritage procedures, rather than the landscape which they underlie or its associated aesthetic value; these having been relegated to the role of “ancillary value” along with other emerging tropes such as cultural or pedagogic values (links with and references to the past in service of the present and the future). Yet we are already witnessing a new value slippage: for the cultural field has been presented over the last few years as constituting the major lever for promotion within the geoscience field (Panizza & Piacente, 2003). In this way, geological and geomorphological sites – as much in the Alps as everywhere else in Europe – play their role in that heritage renewal which, in a globalized world, tends towards that large understanding of cultural heritage – including natural values –, which constitutes the specific nature of different territories.

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ABSTRACTS

In the Alps — as with the rest of Europe — renewed interest in geoheritage sites has grown since the late nineteen-nineties. Inventory, conservation and promotional (didactic, tourist) projects for geosites have blossomed at every scale — local, national and international — articulated around the central concept of geodiversity. The present article will demonstrate that far from being an entirely new tendency, this constitutes rather a specific stage in a number of different threads of the history of landscape heritage, on-going since the nineteenth century. What is new, however, is the movement that consists in basing the selection of heritage sites on their intrinsic scientific value with regard to their pertinence to the history of the Earth, rather than for any merely picturesque or aesthetic qualities. This tendency towards the implementation of geoheritage contributes to the general drive for the sustainable development of alpine territories, particularly by means of the establishment of territorial development tools such as Geoparks.

Depuis la fin des années 1990, on assiste dans les Alpes, comme partout en Europe, à un nouvel intérêt pour les géopatrimoines. A toutes les échelles — locale, nationale, internationale — ont émergé des projets d'inventaire, de protection et de valorisation (didactique, touristique) des géosites autour du concept de géodiversité. Cet article montre que ces tendances ne sont pas nouvelles mais constituent plutôt une étape dans des trajectoires patrimoniales diverses, initiées dès le XIX^e siècle. La nouveauté est une patrimonialisation basée sur la valeur scientifique intrinsèque des sites, en tant que témoins de l'histoire de la Terre, et non plus seulement pour leur valeur esthétique ou pittoresque. Ce mouvement de patrimonialisation participe de la volonté de développer durablement les territoires alpins, notamment à travers la mise en place d'outils de développements territorial tels que les géoparcs.

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