Protection of Geological Heritage: A North American Perspective on Geoparks

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Introduction

The First International Conference on Geoparks was held in Beijing, China, in June 2004. At that conference we were immersed in the UNESCO (United Nations Educational, Scientific, and Cultural Organization) concept of geoparks for the first time. As North Americans, we take for granted national, provincial, and state parks, which are scattered throughout the continent and provide recreational and educational opportunities. The concept of parks is a long-standing one in North America, whereas the UNESCO concept of geoparks is relatively new. In this paper we compare the two kinds of parks and explore the value of both as sites of geoscience experience and education.

North American parks

Parks have been an integral part of North American life for more than a hundred years. The first national park in the United States, Yellowstone, was established in March 1872. This marked the first occasion when public lands were set aside and administered by the federal government for the purpose of preservation, recreation, and education. The government of Canada likewise has set aside national parks and national park reserves for a variety of special purposes, including recreational use and preservation of wilderness. In 1885, it established the country's first national park, at Banff, Alberta.

The long history of parks in North America has given rise to a tradition of family camping holidays that are part recreation and part education. Over the last hundred years millions of North American children have developed their first taste of the natural environment from a visit to a national or provincial park. As a result, parks have become major centers of environmental, scientific, and cultural education.

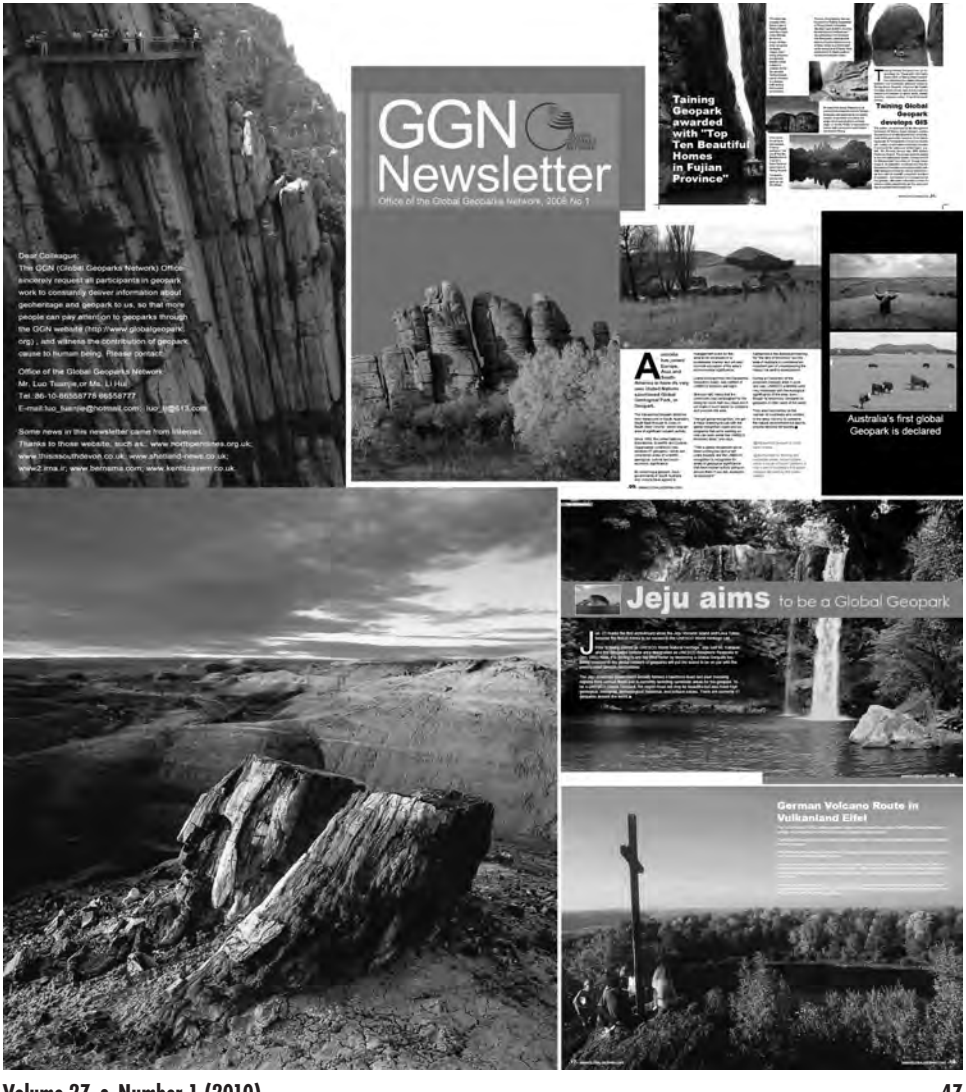
The UNESCO concept of geoparks

The concept of a geopark, as outlined in the operational guidelines published by UNESCO in 2002, is to serve the three goals of conserving a healthy environment, educating in the earth sciences, and fostering sustainable, local economic development. The ultimate goal of UNESCO's geoparks program is to provide for a better understanding of geological heritage and wise use of the earth.

A geopark is a geographically defined area containing one or more geoheritage sites selected on the basis of scientific importance, rarity, or scenic quality, or its relation to geological history, events, and processes. An added impetus of the geopark concept is to connect with local archaeological, ecological, historical, or cultural values.

One of the great strengths of geoparks is that they are all linked under one international program sponsored by UNESCO. A visitor to one geopark will be made aware of all other such sites in the world, akin to the recognition afforded to World Heritage sites (Figure 1). Another strength of the geoparks concept is that it fosters socioeconomic development in a region. The guidelines stipulate that this development must be culturally and environmentally sustainable, while encouraging local businesses and cottage industries and, ultimately, the creation of new jobs, including in geotourism. The intent is to improve living conditions and the rural environment and, in doing so, strengthen the connection of people to their land.

Figure 1. Global Geopark Network publications provide local sites with international recognition and publicity. Images are courtesy of the Global Geoparks Network website (www.globalgeopark.org).



Conservation of sites of geological interest is a core value of the geoparks program. Obviously this aspect of geoparks needs to be evaluated in the context of national and regional government regulations and in consultation with an appropriate national or regional geological survey. Once a geopark is established, it is managed by an agency or group that is responsible for the conservation of the area, including any physical maintenance.

A basic tenet of the geoparks program is to provide educational opportunities for visitors. The educational scope is broadly defined and includes not only scientific explanations of geological features but also education on broader environmental issues and sustainable development. A key element of an application for geopark status is the pedagogical program that is planned for the park and target groups.

Perhaps the most interesting aspect of geoparks is that their administration involves a broad cross-section of the community. Public authorities, local organizations, private interests, and research and educational bodies all have a say in the design and running of the park. The intent is to stimulate discussion and encourage partnerships between the different groups involved, thus developing a sense of community and empowering the local population.

In the following section we will compare the geopark system with the system of parks that has long existed in North America.

Comparison of park concepts

Parks in North America have been established to protect the natural environment or historical heritage from development. When Europeans first arrived in North America, they saw almost completely undeveloped and unspoiled lands. Parts of this undeveloped land were initially protected as parks. As development has moved to more remote areas, such as the Canadian Arctic and Alaska, the establishment of new parks has continued. In many other parts of the world, where population density has been much higher over a much longer period of time, little or no land remained undeveloped, thus there was no opportunity to protect it. This simple fact is, in essence, the difference between park development in North America and elsewhere.

The availability of undeveloped land for protection means that the philosophy of North American parks is partly different from that of geoparks. Parks in North America are areas of complete protection with only small areas set aside for development. The protection is strong and complete, and any activity to be undertaken in the park is subject to scrutiny and permitting. In this philosophical environment, the socioeconomic development that has taken place was a by-product of the process rather than something inherently favored by it. In some cases, development has reached such an extent that there is now strong debate about allowing it to continue. In Canada in particular, the amount of development that is taking place at the townsite of Banff, Alberta, which is part of the Rocky Mountain Parks World Heritage Site, is being vigorously debated. By contrast, sustainable socioeconomic development is encouraged in geoparks in Europe and China and is considered in the way the park is developed. This is a highly significant difference and allows development of parks in concert with socioeconomic concerns in the region.

A second fundamental philosophical difference is that the entire local community is

engaged in the development of a geopark. Local administration, business, educational, and research organizations all play a role. When a new national park is established in Canada, people may be moved out of the area because the philosophy is to return the area to its natural state and not to consider human interaction with the land.

A third difference between North American parks and the geoparks system is that all geoparks are interconnected, each providing reference to the others. In North America, parks have separate and different origins, which depend on the level of government that supports them. They range from the better-known national parks, to provincial and state parks, and municipal parks. There are many different categories of parks and recreation areas, and the degree of protection afforded each is different. Some, like national parks, have strong preservation and conservation focuses, whereas others allow limited forestry and oil and gas development, as well as recreation. Both North American parks and geoparks play similar roles in terms of their mandate to protect geoheritage and to educate the public. Interpretive signs and tours are hallmarks of both kinds of parks.

Scope for geoparks in North America

North America is well endowed with parks of all sorts, but we believe there is scope for geoparks in the United States and Canada. Most existing parks in North America are located in areas of exceptional natural beauty or significant historical heritage. There are, however, many other places with significant geoheritage located far from the normal tourist haunts. Many of these areas are economically depressed. The decline of the rural economy in recent years has meant the depopulation of many small towns. Such areas could benefit enormously from the establishment of geoparks. Examples include places with exceptional fossils, rocks or minerals, areas with a rich history of mining or energy development that is now complete, and remote communities in northern regions. Establishment of a geopark could increase tourism to the area and help to reverse a declining economy.

A significant advantage of geoparks over traditional North American parks is that the primary motive for establishing them is an aspect of geoscience. The park thus serves primarily as a vehicle for geoscience education. By contrast, many North American parks that are located in areas of interesting geology focus more on the ecology and biology of the area than on the geology.

Parks and geoscience education

Whatever its origin, a park presents an opportunity to educate the public if it contains significant geoheritage (Figure 2). North American parks allow for communicating many geoscience issues to the public. But how much high-quality communication occurs? And what are the messages that are communicated to park visitors? Most park educational programs focus on ecology and biology, and, on average, much less attention is paid to geology. On the other hand, geoparks are dedicated to the interpretation of geology, albeit with recognition of the ecological and cultural values in the area. The average visitor to a North American park has little understanding of earth sciences because it is not widely or consistently taught in schools. Much to the amusement of the rest of the world, we still struggle with the teaching of evolution in many areas.

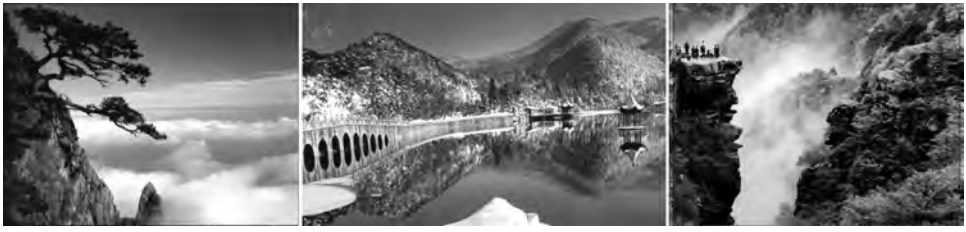


Figure 2. The hallmark of a global geopark is excellence in geoconservation, sustainable tourism development, and education of the public. Photos of the Mount Lushan World Geopark in China are courtesy of the Global Geoparks Network website (www.globalgeopark.org).

One of the difficulties in communicating geoscience issues is that geology tends to get lots of negative news. Perhaps a volcanic eruption or earthquake has devastated an area and caused substantial loss of life, or maybe there has been a catastrophic flood, a landslide has blocked an important highway, or an oil spill has polluted the ocean. None of these stories provides a positive image of geology. The challenge is to provide necessary background information to people so that they come to understand earth processes better. It is important to show that earth processes, like the seasons, affect our everyday life.

A second key issue to explain to the public is the degree to which people rely on earth resources in their everyday lives. The lack of understanding of the relationship between well-being and natural resources is particularly acute in developed countries, especially among the inhabitants of large cities. Rural people, who are closer to the land, have a better intuitive understanding of our relationship to resources and the earth. Ironically, parks are commonly places where resource extraction or other land disturbance is prohibited. This, in itself, leads those with an interest in the environment to develop a negative attitude to resource industries, but the fact is that all humans rely on the extraction of resources.

We need to pass on the message that earth resources are precious and should be used wisely, and to show that they are localized such that natural processes, not human choice, dictate locations of gravel pits, mines, and oil wells. We must indicate that earth's resources are limited and should be conserved and recycled wherever possible. We should state that in many parts of the world earth resources are too cheap for us to value them properly. For example, car fuel has been so inexpensive in North America that people have bought larger and heavier cars than in the past. Now, with rising fuel prices, people are beginning to understand how much energy they use.

A teacher can play the game of "find the resources" with schoolchildren, in which the challenge is to find something in the classroom that is not made from a resource that came from the earth. In this game it is easy to demonstrate that everything in the classroom comes from the earth. This is the type of activity that should be conducted with families in parks so that they get a better understanding of their reliance on earth materials and learn to respect all aspects of the issue, from exploration to exploitation to clean-up.

What better place to begin this process of education than at parks of all sorts? Geoparks have an advantage over traditional North American parks in that their philosophy of preservation includes human interaction with the earth. Indeed, some geoparks, e.g., the Copper Coast in southeastern Ireland, are based on the historical extraction of minerals from the area.

At least three groups of people can be educated through parks. First, there are the politicians who make decisions on the preservation of park land. It is very important that geoscientists provide information to politicians so that they can make better, more informed decisions. In Canada, we work the legislatures and try to connect with politicians in their electoral districts. In the United States, geoscientists have taken politicians on field trips. Such trips provide an opportunity to cultivate productive working relationships between scientists and decision-makers. The second group is the general public, which is the largest group of park visitors and yet perhaps the most difficult to educate. It is difficult to reach everyone in such a diverse group, thus it is probably best to focus on the third group, children, who are, after all, the planet's most important natural resource.

Parks are wonderful places to provide hands-on activities for children, providing experiences that they will remember through their adult years. There is a long tradition of park interpreters providing programs for families in North American parks but, sadly, these are much more limited than they used to be. Many park interpreters are formidable musical or dramatic performers that amuse and educate at the same time. Parks are also wonderful locations for teaching teachers, which is perhaps the most cost-effective and least time-consuming way of getting important geoscience messages out to the public. Each teacher who understands something about the earth can pass that information on to his students. If they are passionate about what they teach, they will leave an indelible mark on the generation under their instruction.

In all the educational activities that take place in parks we must let people know that earth scientists do sophisticated work to locate resources, understand earth processes, and develop plans for the environmentally responsible and sustainable development. Our profession needs more respect on the world stage.

Interpretation of the earth through parks of all types can result in a number of societal benefits. These include a better-informed electorate that is more sympathetic to science, better-informed decision-makers, people who live in greater harmony with the earth and use earth resources wisely, and children that grow up to be more attuned to the earth, its resources, and processes.

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