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Preserving the Earth's Geological Heritage*)

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2 Text-Figures

Earth's History
Geological Heritage
Preservation

Contents

1. Definition and Significance of the Geological Heritage 95
2. Damage to the Geological Heritage 95
3. Means of Action 96

Why talk of protecting the geological heritage at a colloquium entitled "Apocalypse Now?" Trying to estimate possible future scenarios for our planet can be done only with proper knowledge of its past, and historian Fernand BRAUDELS famous phrase, "A present without a past has no future", is just as applicable to today's civilizations as to our own planet.

1. Definition and Significance of the Geological Heritage

We geologists are here to try and understand and recount the Earth's four-and-a-half-billion years history.

To read this history we only have the Great Book of the Earth, made up of pages of stone, covered not with letters and words, but with fossils, current marks, sedimentation rates, etc. To be able to piece together this history, it would be best to have all the pages. Thus, each missing page, each geological site destroyed, leads to the unrecoverable disappearance of a part of that history.

The Earth's history is what is internationally considered today as a heritage in itself: the geological heritage. This heritage is common to the Earth, to mankind and to all the life forms that make up what we call the "Memory of the Earth".

In 1991, after the First International Symposium for the Protection of our Geological Heritage, held in Digne, France, under the patronage of UNESCO, the one hundred fifty participants from more than thirty countries unanimously adopted a basic text entitled: "International Declaration of the Rights of the Memory of the Earth". This declaration, which has now been adopted by nearly one hundred national Geological Societies or Academies of Science, is at present a basic text defining, fortunately in rather poetic terms, the geological heritage to be protected. I propose to recall articles 6, 7 and 8 of this declaration:

Article 6: Just as an old tree keeps all the records of its growth and life, the Earth retains memories of its past... A memory inscribed both in its depths and on the surface, in the rocks, in the fossils and in the landscapes, a record that can be read and translated.

Article 7: We have always been aware of the need to preserve our memories – our cultural heritage. Now the time has come to protect our natural heritage: the environment. The Earth's past is no less important than that of human beings. Now is the time for us to learn to protect, and in so doing learn about the past of the Earth, to read this book written before our advent: that is the geological heritage.

Article 8: We and the Earth share a common heritage. We and governments are but the custodians of this heritage. Each and every human being should understand that the slightest depredation mutilates, destroys and leads to irreversible losses. Any form of development should respect the uniqueness of this heritage.

This geological heritage, the memory of the Earth, is beginning to be taken into account by a large number of nations in Europe and on the other continents.

2. Damage to the Geological Heritage

In all countries, the damage undergone by this heritage is practically always the same; it can be divided into two categories: depredation due to erosion and depredation

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due to human actions. First, the depredations connected to erosion. They are obvious, and the protection of the geological heritage may entail instituting specific structures to ensure long-term conservation of exceptional sites or outcrops. Here, for instance, is a museum built on a site in southern France to protect the skeleton of a Toarcian-age ichthyosaur. Depredations connected to human action may be divided into two categories: accidental and intentional. Fortuitous human actions are one of the major threats to this heritage, mainly connected to land development: road building, housing construction, quarrying, dumps, etc. They can often cause irreversible destruction to geological sites of great interest. In spite of this, we must not forget that some of this work has revealed the existing of important new sites.

Intentional human actions, depending on the countries, may have a major impact on this heritage.

Mankind has always been fascinated by fossils and minerals and this fascination has led, and still leads, in some countries to looting and irreversible damage to many fossil-bearing sites. The first reason for this damage is unquestionably connected to the rising price of fossils. Besides an easy way to make money, "treasure hunting" against the background of the generalized economic crisis encourages the development of unacceptable marketing and sale of such elements of the geological heritage. Motivated more by passion than by vital interests, some amateurs and collectors may also manage to destroy sites by repeated or excessive visits and collecting. Finally, we must admit that some professionals (academics, museums, etc.) for their research on teaching may sometimes also be to a certain extent responsible for the disappearance or exhaustion of some sites.

3. Means of Action

For more than fifteen years now, many countries, usually western countries, have begun to show concern for this heritage. Our British colleagues were precursors in this area, the first to set up a specific policy for their entire national territory in the fifties. In this brief presentation, I will not have time to dwell on the legal specificities in the various nations. So I will limit myself to naming two works distributed internationally and which will allow you, if you so desire, to have a detailed view of existing national legal measures in the area of protection of the geological heritage.

They are, first:

- The Proceedings of the First International Symposium on the Protection of the Geological Heritage, held in 1991; Special Memoire of the Geological Society of France, published in 1994, and
- "Earth and Landscape Conservation", the Proceedings of the Second International Symposium held in Malvern (GB) in 1993, published by the Geological Society of Great Britain in 1994.

In spite of the uneven degree of effort on the national level, it seems obvious to me that protection of the geological heritage can be truly successful only through strong international action, pooling all the national actions to build a single general policy.

On the European level: Since 1988, a European association was instituted, now called the "European Association for the Conservation of the Geological Heritage" (ProGEO). It is an association of all kinds of conservation practitioners and all types of geoscientists involved in conservation as planners, members of our State's heritage, in geological surveys as managers and interpreters of sites, as museum curators, educators and as those concerned with tourism. This association works towards the promotion of protection of the rich geological heritage of Europe and implementation of a European policy on this problem.

I am pleased to bring my contribution to this association, in which our friend Hans-Peter SCHÖNLAUB is very active and also our colleague. If you would like more information on this structure, you should be able to find some brochures in the room.

On the international level: After the Second International Symposium in Malvern, an international task force for Earth Science Conservation was set up by all the participants. It was entrusted with three main missions:

- furthering the creation of regional networks to protect the geological heritage (North America, South America and the Caribbean, Africa, the Mediterranean, Australasia);
- proposing the draft of an international charter to be presented at the Third International Symposium scheduled for 1997;
- organizing the basis for an international structure for protecting the geological heritage, which should be set up after the 1997 meeting.

What I have just presented bears essentially on regulations and policy aspects, but it seems obvious to me that as long as our respective populations have not assimilated the value of this heritage, and thus the interest in protecting it, we will have great difficulty in succeeding. For me, the only way to achieve real protection of the geological heritage must go through raising public awareness.

Many colleagues in Austria and in various countries, are actively working in this direction. I would like to illustrate this, if you will excuse me, with examples from my own experience in France. Public awareness of the significance and value of this heritage, acts on different levels. First, on a national level, with the implementation of vast communications operations.

Thus, I would like to present the example of an experiment conducted in 1989 in collaboration with the Ministries of Research and Environment, the French Geological Survey and the French SPOT satellite.

Its purpose was to raise awareness as broadly as possible through a major advertising campaign. The principle was quite simple, based on the trilogy: past, present and future. For the past: we explained that, nearly two thousand years ago, the Nazca culture in Peru had wanted to provide an image of its environment as viewed from Space and, to that end, had drawn huge outlines of flowers and birds on the ground.

For the present: we asked the question: how, in 1990, could mankind have a similar undertaking, present the environment to be viewed from Space? The answer we suggested was simple: today we must assert our planet's identity and, for that, we proposed tracing on the ground, over an area of 380.000 m^2, the alchemic symbol for the Earth, which as you know is the female symbol reversed. This symbol was to be photographed from space by the SPOT satellite.

The third part of this action bore on the future, where we explained what I presented at the beginning of this paper: that the future of our planet is conceivable only through perception of its history and, so, by the development of the Earth Sciences ... and protection of the geological

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heritage. This operation, while contributing to a series of tests for adjusting the SPOT satellite, was one of the first successful Space Art operations, combining art, scientific research and technology. It was broadly diffused both nationally and internationally.

On the local and regional level: to achieve protection of the geological heritage, it is essential, I believe, that the public be able to make this history of the Earth, as told by geologists, its own. In fact, geologists are only the translators of that history. And that is why it seems necessary to me that, at a certain level, the Earth's history, once told by scientists, be taken over and borne by others, who alone can contribute to making the geological heritage an inalienable component of a cultural heritage shared by all.

For example, at this time we are organizing in southern France a vast operation over a one-year period. This operation, called "Memory of the Earth", aims to draw together, around a group of scientists, all sorts of people involved in various cultural activities: artists, philosophers, film-makers, writers, photographers, theatre in the street. All were invited to express themselves on a series of six themes running through this operation. Each theme lasts for a two-month period and is based on pairing with the Earth: Man and the Earth, Life and the Earth, Shape and the Earth, Movement, Transformation and the Earth, Time and the Earth, Space and the Earth. For each theme, lectures and many contemporary art exhibitions are organized. Books on art, photography, literature, science and philosophy are being printed by various publishers on the theme "Memories of the Earth". Similarily, works by famous contemporary artists are created in the context of this operation: in particular the New York sculptor Tom SHANNON, the Land Art creator Andy GOLDSWORTHY, French painter Pierre ALECHINSKY ... Various shows and entertainment, some of which draw audiences of 5.000, have been and will be scheduled.

Through such operations that touch a broad part of the population and, of course, the work of raising awareness that must be pursued in the schools, we hope to be able gradually to encourage our compatriots to extend their own roots so as to make the history of the Earth an indissociable part of their own story. Thus, by such approaches, the geological heritage may be intelligently perceived and therefore protected.

In conclusion, I would like to tell you what is, in my mind, the true message of the geological heritage and its protection. By enabling us to study and recount the Earth's history, it allows us to foresee future possibilities. But, especially proper knowledge of this heritage leads us to imagine new relationships between mankind and the Earth. Relationships in which Man could forget the temporal anthropocentric interpretation of our planet and integrate into daily life another temporal reading: that of the Earth's time span. A way towards the notion of relativity, not the truth of the world, and a basic opening up to tolerance, which it is so important to recognize and cherish in the context of our contemporary societies.

Aware of the importance of this geological heritage and the means necessary for achieving its protection, I also believe that we should ask ourselves about the function and positioning of the geologist in the future, and especially the geologist's function in society.

Let us not forget that we have a fabulous profession, we have the rare privilege of travelling through time to attempt to translate those four and a half billion years of the Earth's history. We have a very great responsibility, that of reading and interpreting the Earth, and especially that of being able to "make the Earth speak". Let us simply hope that we will be able to find the right words ...

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