

Geological Heritage

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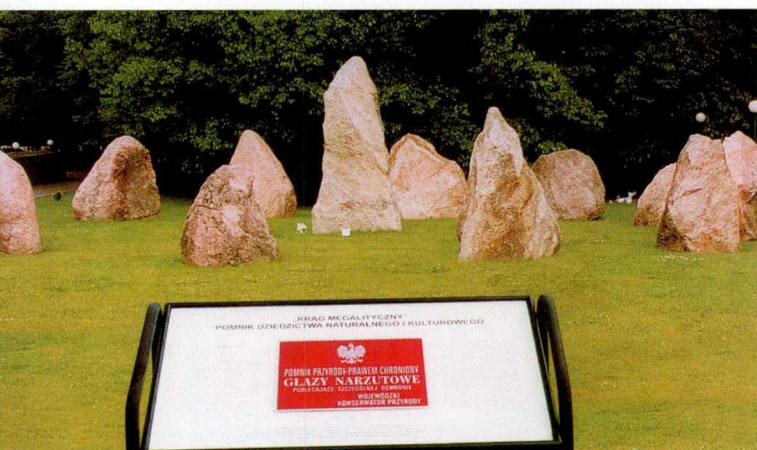
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A new project aiming to protect geological treasures of an inanimate nature

In the last decade there has been a steady rise in recognition for the concepts of geological heritage and modern geoconservation. Unique rock formations comprise a fundamental, non-renewable natural resource, one that is also a testament to the geological history of the Earth and its processes, as well as an indisputable link between geo-diversity and biodiversity. The evolution of life, including the natural history of Man, cannot be reconstructed without considering its geological basis. However, in spite of

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the importance of geology for the environment, there was little acceptance for the necessity of geoconservation. An excellent means for increasing public awareness of this idea came with the International Declaration of the Rights of the Memory of the Earth (Digne, France, 1991). The best recapitulation is this elegantly worded quote: "We have always been aware of the need to preserve our memories



Megalithic circle made of unmodified erratic boulders in Warsaw demonstrates one possible way to protect geological objects in an urban environment

Examples of Polish geological heritage

Słowiński National Park - classical active coastal dunes, one of the largest areas of this very rare kind on the Baltic coast.

Crystal Caves in the Wieliczka Salt Mine - a world-class, legally protected underground nature reserve, with unique crystalline covers; one of the oldest salt mines in Europe and the oldest still in operation, listed by UNESCO as a part of World Cultural and Natural Heritage.

Krasiejów (near Opole) - abundant late Triassic vertebrate fossils, containing rare specimens of early dinosaurs; a unique documentary site of profound scientific importance.

Krzemionki Opatowskie (Świętokrzyskie Mountains) - a nature and archaeological reserve; a perfectly preserved Neolithic flint mine, the largest in Europe; protected also as a National Monument of History.

Trygław Stone (north-eastern Poland) - the largest erratic boulder in Poland, possibly the biggest in the European Lowlands (ca. 50 meters in perimeter).

- our cultural heritage. [...] Now the time has come to protect our natural heritage. [...] It is time for us to learn to protect this Earth Heritage, and by doing so learn about past of the Earth, to learn to read the 'book,' the record in the rocks and landscape, which was mostly written before our advent". These ideas are not just a topic for theoretical analysis, they also pave the way for practical solutions, which map out the development of modern geoconservation in accordance with mainstream nature conservation, including sustainable management of natural resources.

The innovative and ambitious GEOSITE project, initiated in 1996 under the guidance of the International Union of Geological Sciences (IUGS), and coordinated by the Global Geosites Working Group, has become one of the most interesting projects in earth sciences. GEOSITE's focus is on the identification and selection of geologically significant sites and areas around the world, and the further compilation of comprehensive national and international inventories of World Heritage. Effective protection of the most valuable geoscience sites also means safeguarding the best resources for research.

Mapping the treasury

The initial stages and pilot studies of the GEOSITE project in Europe have been carried out under the joint auspi-

ces of the IUGS and the European Association for the Conservation of the Geological Heritage (ProGEO). Poland is actively taking part in the project, especially in the Central European Working Group, lead by the Polish Academy of Sciences' Institute of Nature Conservation in Kraków. As a result of effective collaboration by geoscientists from Central and Eastern European countries, the first draft candidate lists of geosites representative of Central Europe were published in 1998 and 1999, being supplemented and verified in the following years. The latest Polish list of representative geosites was published in 2003. This

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list contains 149 site-sets and individual key geosites reflecting the diversity of geological formations in Poland, which were selected using an agreed scientific evaluation scheme and proposed for the European List of Geosites.

The legally established geoconservation effort in Poland currently includes 70 inanimate nature reserves, more than 1600 inanimate nature monuments and about 90 documentary sites of inanimate nature. Additionally, important geological features and sites are incorporated in national parks, wildlife reserves and landscape parks, specifically for their intrinsic character and scientific value. Many other sites of purely geological importance, however, are not adequately protected by the law.

Currently, research on Polish candidate geosites is coordinated jointly by the Polish Academy of Sciences' Institute of Nature Conservation and the recently established Center of Excellence: Research on Abiotic Environment (REA) of the Polish Geological Institute (PGI). The PGI has launched many important initiatives, especially detailed geological mapping as a basis for selecting representative geosites, as well as the Geoenvironmental

Exposed basaltic pillars in Myślubórz – a spectacular and rare example of Tertiary volcanism in Eastern Europe



Bożena Rudnicka

Map of Poland (1: 50,000). An international conference entitled "Geological Heritage – Concept, Conservation and Protection Policy in Central Europe" was held in Kraków in October 2003. This conference summarized the current stage of work and science-based assessments of proposed geosites from different parts of Europe.

Nature's movable monuments

The concept of geoconservation has undergone a huge shift in recent years, from the traditional protection of selected geological phenomena towards the preservation



Krzysztof Jakubowski

Gigantic halite (NaCl) crystals in the Crystal Cave in the Wieliczka Salt Mine. Single crystal edges can be up to 40 cm long

of geodiversity, based on more systematic research and a broader approach. This has given specialized geological museums and multidisciplinary natural history museums containing earth science collections (mineralogical, palaeontological etc.) a new significance and a new role to play. Many such collections are kept in museums because of the need to protect valuable and unique minerals, rocks and fossils found at the most important geosites. This is often the only way to preserve these artifacts, called "mobile monuments of inanimate nature" or "movable geological heritage."

The idea of establishing a strong connection between the role of museums and the protection of inanimate nature has a long tradition at the Polish Academy of Sciences' Museum of the Earth. Research in this field plays an important role in the Museum's educational activity. Through special exhibits, it aims to stimulate public awareness of the need for geological heritage conservation. ■

Further reading:

Geological Heritage Concept, Conservation and Protection Policy in Central Europe – International Conference, organized by REA and PAS, Kraków, Poland, October 3-4. *Abstracts and Field Guide-Book*. Polish Geological Institute, Warsaw 2003.