



Tertiary reef structures overlying gently dipping Precambrian and Palaeozoic sediments at the bank of the Dnistr reservoir.

International symposium, ProGEO 2006.

European conservation policy of Geological Heritage. Theory and Practice.

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The symposium was held in Ukraine (Kyiv) 4-5 September, followed by field trips and field discussions in the area around Kamianets-Podi'lsky. It was attended by participants from large parts of Europe with a majority from the eastern parts. The theme of the symposium was divided into several sessions:

- Geoconservation, geosite protection
- Geosites, classification and databases
- Geoparks – geotourism

- Geological and cultural heritage: geoschool

and covered large parts of the modern development within geological heritage. For me it was particularly interesting to get an updated review of the status, thoughts and development in Ukraine and Russia.

The presentations covered many issues and it is clear that ProGEO have an important role to play in dissemination and discussion of experiences from very different management systems.

The program contained 18 oral presentations and several posters. The meeting was arranged with simultaneous translation which worked fine. As a conclusion a short declaration was accepted by the symposium supporting ProGEO activities in Ukraine.



Fossil-rich rockwall at a walking path in a canyon, Kaminets-Podol'sky

The post-symposium excursion was held in an entirely different part of Ukraine, in the district around the city of Kamianets-Podol'sky, near the boarder to Moldova.

The terrain has a character of a plateau which elevation falls to the south. The relief is characterized by the combination of vast flat interfluvies and canyon-like valleys falling into the Dnister River. The tectonically position of this area is defined as belonging to the province of the joint of the south-western and western slopes of the Ukraine Shield (named as the Podolian plate) and the Dnister zone of the pericratonnal depression of the East European platform. There are distinguished two structural mega-complexes; the lower crystalline basement (mainly supercrustal and ultrametamorphic rocks of the Archaean and lower Proterozoic ages) and the upper sedimentary cover (two main complexes: the Upper Precambrian- Lower Palaeozoic and Mezo – Cenozoic with a distinct gap in sedimentation between them).

Especially fascinating for me was a day boating cruise on the large water reservoir of the river Dnistr. The mighty river valley was dammed and formed a long and narrow lake over a distance of 93km. The lake reached a level up to the vertical cliffs high in the valley sides. The bedrock was gently dipping, often almost flat-lying, and the cruise offered magnificent views of sections stretching from Precambrian (Vendian) over Mesozoic and with spectacular tertiary reefs forming small mountain tops along the route.

The cruise showed a beautiful, but artificial landscape on this man-made lake. It was mentioned that several good geosites has been drowned, but it would have been nice with a more principal discussion of the environmental impacts of the dam. It was clear that it had a major impact for settlements, cultural heritage and landscape as well as the impacts on geosites. How impacts of this scale are understood locally as well as nationally is an important part of the understanding of environmental management systems.

It was also very interesting to see the city of Kaminets-Podol'sky. The city has a rich cultural heritage in a plateau landscape with impressing canyons and gave an ideal setting in demonstrating the meeting point between cultural- and geological

heritage. A nice walk traversing one of the canyons gave good views geologically as well as touristically.

In Ukraine the State committee for Nature protection (part of the ministry Nature Resources) has the responsibility of policy development and management practice within geoconservation. The problem is that geological projects have difficulties getting support, and there is a major lack of cooperation between Zoologists, botanists, geographers and geologist within nature management.

This is a problem that many other countries in Europe experiences and seems as a major task to overcome in the future. Let us hope that the 2006 symposium in Ukraine has contributed in this process.

Geo-trails along cultural GEO-SITES in Attica (Pilot application on planning and promotion of alternative tourism, Geo-tourism).

Galanakis D., Theodossiou I., Demertzi V., Koutsouveli A., Alexouli A., Fermeli G. – corresp. Corresponding e-mail: ren@igme.gr (Abstract from ProGEO 2006, Ukraine).

This project argues the importance of recording cultural trails with important geological-geomorphologic components for geo-tourism and educational use, in Attica, Greece. A pilot application of such a scheme could be undertaken along a historic itinerary, the Procession Road: from Eleusis (ancient city where the Eleusinian Mysteries, rituals celebrating nature, used to take place in ancient Greece, fig. 1) to the “ Eleusinian in the city” under Acropolis of Athens (fig. 2), via Iera Odos (Procession Road). Known since the time of the Eleusinian Mysteries, the itinerary includes areas of special geomorphologic interest related to cultural events as well as two UNESCO World Heritage Sites (Daphni Monastery and the Acropolis of Athens).



Fig. 1: Eleusis (ancient city where the Eleusinian Mysteries, rituals celebrating nature, used to take place in ancient Greece).



Fig. 2: Schematic representation of the Acropolis in Athens and its geological-tectonic regime.



Fig. 3: Karst and caves in the Eleusis archaeological site connected with the Eleusinian Mysteries (cultural geotopes in Cretaceous grey limestones)

The geo-trail has already been designed and a number of sites/stops of geological interest connected with cultural activities have been identified. These cultural geosites of both historical and tourist value will be subject of interpretation for a geo-tourism guide and an educational publication aiming to provide information and increase public awareness.

The nodal points of the geo-trail are the sites, views or panoramas of geological interest inside both archaeological sites (Eleusis and the Acropolis of Athens), as well as the description of sites along Iera Odos, all of which are thoroughly described.

The interpretation of the sites will be provided through special informative and educational geo-tourist material, such as explanatory signs, booklets and leaflets. The informative material will contain historical data on each site, its potential relation with geological elements (features of rocks e.g. karst, tectonics and geomorphology are connected with the cave of the Eleusinian Mysteries, fig. 3), the use and origin of building materials in ancient monuments and the changes human activities have caused on geo-environment through history.

All the above-mentioned activities aim at raising the public's awareness of the fact that the geological component is a significant environmental and cultural factor.

The project also aims at recording the implementation of such an experience, creating guidelines and compiling a geological-cultural database for further use. The geological elements will be processed with the use of new technology such as G. I. S. Additionally, the data gathered will be available to visitors via MMS, thanks to a pilot application developed by a private company involved in the project.



Dampier Archipelago Rock Art

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On Australia's west coast, about 1500 km north of Perth lies an archipelago of 42 islands. These islands are covered by one of the world's largest collections of rock art. As a student in conservation of monuments and sites at the KU Leuven (Belgium) with a background in geology I participated in a campaign led by the National Trust of Australia to fight for the preservation of this heritage. I got this opportunity as part of my participation in the Sharing our Heritages exchange program between the EU and Australia. The rock art of Dampier Archipelago is endangered by its designation as one of the most important industrial development sites of Australia.

Until around 6000 years ago, due to the sea level rise after the last ice age, a group of hills became what are now the islands of Dampier Archipelago. The islands are mainly composed of granophyre, but there are also occurrences of gabbro, granite and dolerite. These

Fig. 1. Industry disturbing the landscape (Photo: Robin Chapple)

stones form low hills composed of angular boulders that to many people may look like they have been piled up there by the iron ore industry, but actually are the normal weathering form. These boulders are covered with petroglyphs that were made by the removal of material by pecking and engraving. The visibility of these petroglyphs is enhanced by the contrast in colour between the different layers of the rocks. The fresh material is grey, but it does not play an important role in the rock art due to its hardness and the presence of a weathering layer. This weathering layer is several centimeters, softer and pink coloured which contrasts with the very thin shiny red to black layer that forms the outer surface of the blocks through which most of the petroglyphs have been made.

Very little is known about the original inhabitants, as of the Jaburara who were the people living in the area when the Europeans arrived no one survived, in the nineteenth century they were deported or killed by diseases and in a big massacre. But the enormous



collection of rock art they left behind provides evidence for many thousands of years of a now lost culture. Estimates of the amount of art range from 3690 sites to more than a million individual petroglyphs, making it one of the world's largest collections, of which also the diversity and quality are unique. There are images of living and long extinct animals, such as turtles, kangaroos and the thylacine and of anthropomorphic creatures, as well as geometrical designs and many more subjects that probably served both a spiritual and educational purpose. Other forms of rock art present are stones that have been arranged in terraces and standing stones.

The art is under threat of industrial development since that started in the area in the 1960s / '70s and resulted in the connection of what is now Burrup Peninsula to the mainland, as well as the location of petroleum and chemical industry on the former island. Industry started with the construction of a port for shipping iron ore from the Pilbara. This deep water port also attracted plants for the processing of gas from the nearby Northwest Shelf Project and subsequently large energy consuming chemical industry, producing for instance fertilisers.

Fig 2. The famous climbing men and an archaic face (Photo: Thomas van der Linden)

Air pollution and building activity are the two ways in which industry possibly threatens the art. The pollution of the industry is likely to result in the dissolution of the outer surface layer and thus the loss of contrast and consequently the petroglyphs will be lost when they become invisible. Also 40 percent of the surface of Burrup Peninsula has been allocated for industry, which means that large parts have to be cleared and flattened to accommodate plants. This would involve the moving or removal and thus the loss of the petroglyphs in almost half the area.

Despite its value, by specialists considered to be of world heritage level, the Australian government is very slow in the recognition and actually actively stimulates the destruction of the remains of a now disappeared old culture for short term economical gain. One organisation to recognise the value is the World Monuments Watch who gave Dampier Archipelago a place on its "List of 100 most endangered sites" and provides funds for the campaign for the preservation of the rock art.

The destruction of the rock art of Dampier Archipelago will mean that an invaluable expression of culture will be lost for ever. This policy evidences a lack of respect for the memory of a no longer existing culture that goes back many thousands of years longer than that of the people who destroy it.

The international conference on “Geoheritage for sustainable development”

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This conference, in the spar town of Druskininkai in southern Lithuania (May 27-30, 2006), was held under the auspices of ProGEO (European Association for the Conservation of Geological Heritage) Northern European Working Group, IUGS Commission GEM (Geosciences for environmental management) working group IBC (International borders – Environmental concerns), Lithuanian Geological Survey, Polish Geological Institute, and the Institute of Geology and Geography, Lithuania. It was held under the auspices of INTERREG project 2005/041 (Elaboration of geo-environmental assumptions for ‘Geopark Yotvings’ in the cross-border Polish-Lithuanian area) and IUGS-ICSU project “Application of geoscience for sustainable development of cross-border areas”. The aims of the conference were: to promote better understanding of

geological heritage in Northern Europe and to aim at an increasing level of awareness concerning geological knowledge and related problems in society; to promote best practice on such matters as inventory, on-site management, planning, development of geotourism etc.; to strengthen trans-boundary co-operation and promote initiatives in application of elements of the geological heritage in sustainable development. Over 45 people attended the conference from eight European countries.

Lars Erikstad, Norway, set the scene for the first session on ‘Geodiversity and geological heritage of Northern Europe – from local to international significance’ by outlining difficulties that could be encountered in establishing traditional projects in some European countries and went on to discuss the possibilities of achieving more positive action by linking geodiversity with biodiversity, geoconservation with cultural heritage and geoheritage with landscape planning and tourism. Other papers outlined geoconservation activity in a number of European countries where such co-operation is achieving results. It was clear that ProGEO could act as an important partner in many such projects.

The second session on the ‘Geological heritage and sustainable development in cross-border context’ centred on the Lithuanian/Polish border area, the Suwalki/Suvalkija and Dzūkija region, known for its exceptional beauty and its wilderness. It is a landscape resulting from its geological structure, tectonics, the palaeorelief of the basement, the influence of ice



Photo: Albertas Bitinas, leader of field trip in Lithuania at the stand explaining the geological origin of the Bobos Darzas spring to visitors of the Dzukija National Park.

sheets in scouring and then depositing boulder clay and the subsequent erosional and depositional action of the melt-waters. Jurga Lazauskiene Marek Graniczny & Jonas Satkunas set the scene by exploring how cross-border mapping, monitoring, projects and other issues demonstrate the crucial value of geoscientific data in the sustainable development of the geo-environment in cross-border regions. This, together with other papers, outlined the main goals of the project under the auspices of the INTERREGIII/A initiative as being to determine the area of the geopark and promote an understanding of its geographical and geological characteristics. An atlas for environmental protection and territorial planning has already been published, together with a data base of 200 sites for tourists, schools, local communities, nature conservationists and land-use planners.

Two full day excursions took us to many localities in the cross-border Yotvings Belt. Glacial and glaciofluvial deposits cover the largest part of Lithuania, varying from a few meters in thickness in the north to over 200 meters in the uplands. Up to 60% of ground water used for supply and 98% of sand, clay and gravel resources come from these deposits. In the Dzukija and Suvalkija area we saw glacial valleys, glacial deposits, pure water springs, such as the "Bobos Darzas" and the Ulos Akis spring, the suffosion Circus where percolating water has created an enormous void in the continental dune massif, the Bakanauskai Mire formed by ice melt water and the actively moving Gaidžių Galas Dune. In Poland we visited the Hydrological Observation in Sidorówka, in the glacial morainic upland in the eastern border of the Szeszupa Depression, where boreholes show the groundwater to be stabilised at ca 24m in the Quaternary deposits. We viewed the Suwalki Lowland Park from the summit of the cone-shaped end moraine called the Cisowa mountain and from the viewpoint at Smolniki and the Szeszupa Depression where the retreating Baltic ice sheets created moraines, kames and lakes such as the 109m deep Hańcza lake that is the deepest in Poland. The Bachanowo boulders field gave a different view of glacial retreat where about 10,000 erratic boulders originated from the outwash of glacial tills. The final visit was to the core storage of the Central Geological Archive of the Polish Geological Institute that was established during prospecting for magnetite-ilmenite ores.

Volume (pdf file) of the *International Conference „Geoheritage for Sustainable Development“, May 27–30, 2006, Druskininkai, Lithuania: Volume of Abstracts. IUGS Commission GEM, ProGEO, Lithuanian Geological Survey, Polish Geological Institute, Lithuanian Institute of Geology and Geography. – Vilnius: LGT, 2006. –72 p.: iliustr. – ISBN 9986-623-42-1 * 9986-623-42- is accessible on internet
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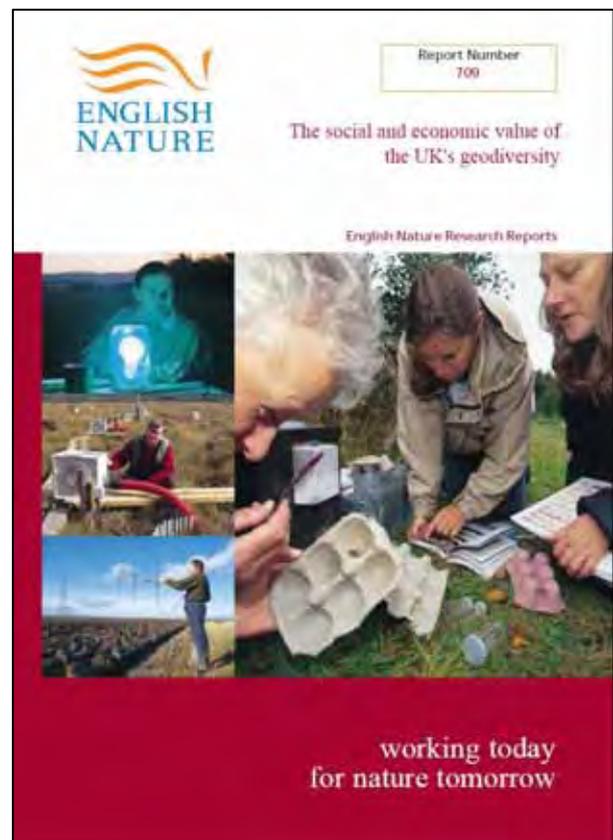
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The value of geodiversity

For all who struggles in persuading their government and different organizations and individuals of the need to give geoconservation some attention, a new publication fro English nature may be of interest:

Webber, M.; Christie, M. and Glasser, N. 2006. The social and economic value of the UK's geodiversity. English Nature Research Report 709. ISSN 0967-876X



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