



Field application - Sanpetru - beds with dinosaurs bonest

Progeo Working Group 1 Meeting In Romania September 2003.

Since 1995 when it was established, the ProGEO Working Group¹ of South-Eastern Europe has met frequently the last three years, holding annually meetings. It has been a friendly competition among the countries in the region for organizing the group meetings and we should say, after attending most of them that the hospitality of the organizers have been at the very high level in all the countries, Bulgaria, Greece and Turkey.

For me, it demonstrate the common willingness in intensifying the activity, based on a firm belief that by working together and sharing ideas and experiences the "lost time" in geoconservation during the communist regimes that except Greece and Turkey, domi-

nated all the other countries in the region, will be easier and sooner recuperated.

This year the annual meeting of WG1 was held in Romania under the organization of the National Society for the Conservation of the Geologic Heritage with support from the Ministry of Education and Research, Ministry of Environment, University of Bucharest and the Council of the Hunedoara County. The meeting was sponsored by RomAqua Group-Borsec, National Geographic Romania, SC Hidroconstructia Retezat, Geocomar and the Town Hall of Hateg. 35 participants from 6 countries: Albania, Bulgaria, Greece, Serbia and Muntenegru, Turkey and Romania attended the meeting.

The WG1 workshop was opened at the Museum of Geology in Bucharest the 22th of September. Here the participants were welcomed by representatives from the Ministry of Environment, Romanian Academy of



The field party at Sanpetru - beds with dinosaurs bones

Science and the University of Bucharest. Bill Wimbledon spoke on the role played by WG1 in the context of the whole ProGEO Association in developing cross-border cooperation. Dusan Mijovici as the WG1 Chairman spoke on some specific activities that demand urgent actions from all the countries members like the Balkan list of GEOSITES in a more concise form. After this introductory part, representatives of each participating country presented short reports focused on the activity progress since the last meeting in Ankara.

The next morning the participants left Bucharest for Santamaria Orlea, a commune close to the Hateg town, a 400 km long journey, most of it close to the picturesque views of the Southern Carpathians. On the way we stopped at the "Women Cave", impressive by its various and beautiful spaeleothems as well as by the numerous remains of *Ursus spelaeus* and other Pleistocene cave mammals. It was the place where we had to explain to Nizamettin Kazanci and his Turkish colleagues why a large stalagmite structure with a particular shape was named "the Turck".

In Santamaria Orlea we stayed for three nights in an 18th century old castle that has been converted into an inn. It is located in the center of the "Hateg Basin", known especially for its reach fauna of dwarf dinosaurs from the end of the Cretaceous.

Two GEOSITES with dinosaur remains, both of an exceptional scientific significance were visited, one at the Sibisel River, near the village of Sanpetru and an

other near the village of Tustea, from where several clutches with dinosaur eggs were collected. The same day the participants also visited two places with high historical and cultural value, the Sarmizegetusa, a large military castrum built by Romans after they conquered Dacia (1st century AD) and the Densus church from the 14th century, the oldest Orthodox church in Romania still in function.

The visits to these mixed sites of geological. Historical and cultural significance, demonstrated an interconnection which the project "The Dinosaur Geopark of the Hateg Country" is based on. The project was initiated three years ago by a small team from the University of Bucharest and it has grown year by year, now involving tens of students from different specialties, local authorities (including all the mayors of the 12 localities of the "Hateg Country"), local firms and enterprises.

The experience that was gained by us in developing this project that try to link geoconservation with local development, was presented during the visit in the field and by a video show commented by Alex Andrasanu during the opening session of the workshop. Thursday 25 September was mostly dedicated to debates on the common activities of the group members. Among the issues was the need for intensifying the efforts by all



*Bill Wimbledon in action at the-
Costesti Trovanti Museum*

the group members in order to finalize the “Geoconservation Manual”. All the participants agreed that without slowing the progress within the activities re-

lated to inventories, geosite descriptions and databases, our Group should step forward to the practical measures for the proper organization and management of the GEOSITES, ensuring their protection and use in environment education and geotourism.

A special debate concerned some new initiatives for enhancing the cross-border actions, among which: development of school and university curricula to include geoconservation in relation to geosciences, increasing the number of students involved in geoconservation and of professional geologists full time employed in these activities, development through agreements of the neighbor countries of geotrails crossing national borders, the first beneficiaries of such trails being the students in Earth Sciences. The representatives of the countries in the WG1 meeting agreed to cooperate closely in creating Geoparks, as a important measure for more visibility of the significant GEOSITES and for promoting geoconservation in relation with local development, a strategy that suits especially the countries from the Balkan region acceding to the European Union.

The debate was concluded with the elaboration of the “Hateg Declaration”, signed by all the country representatives. It is intended that this “declaration” that reaffirm the willingness of the ProGEO WG1 members to develop concrete actions for conserving of the

GEOSITES, will be handed over to the governmental authorities of the involved countries for undertaking the needed measures.

Dan Grigorescu

Mineral collecting and conservation – hammering out a future?

16th April 2003, University of Salford.

This one-day conference was co-convened by English Nature, The Geological Society of London’s Geoconservation Commission and The Russell Society. The conference aimed to provide an opportunity to share views and identify and discuss the issues surrounding mineral collecting.

Eight speakers gave different viewpoints on the issues surrounding mineral collecting, from the perspective of the landowner, the conservationist, academic and amateur collectors, the mineral dealer and the museum curator. The conference concluded with an open debate and delegates were invited to submit written statements, giving their views on mineral collecting issues

The proceedings volume includes ten papers, a brief summary of the debate and the written statements. If anyone would like a free copy of the proceedings volume please contact:

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International Borders and Geoconservation

In 2001, the scientific communities of four international global change research programmes – the International Geosphere-Biosphere Programme (IGBP), the International Human Dimensions Programme on Global Environmental Change (IHDP), the World Climate Research Programme (WCRP) and the International Biodiversity Programme (DIVERSITAS) – accepted The Amsterdam Declaration on Global Change, in which is recognized that a new system of global environmental science is required. The system will draw strongly on the existing and expanding discipline of global change science; integrate across disciplines, environment and development issues and the natural and social sciences; collaborate across national boundaries on the basis of shared and secure infrastructure; intensify efforts to enable the full involvement of developing country scientists; and employ the complementary strengths of nations and regions to build an efficient international system of global environmental science.

Geological boundaries usually do not coincide with international borders. The use of subsurface resources, pollution of groundwater, or changes in land use near the margin of one country can influence the subsurface environment of its neighbour. There is, therefore, a vital need to encourage and promote interdisciplinary cooperation across international borders (onshore and offshore) for the efficient application of geoscientific information in environmental planning, ecosystem monitoring and environment impact assessment in cross-border areas, thus securing sustainable use of subsurface resources, the quality of the environment and the mitigation of geological hazards.

Cooperation in cross-border territories is of particular importance in the implementation of the principles of spatial development policy and could contribute to a reduction in environmental pollution and help secure



Bahanovo, Poland

Cooperation in cross-border territories is of particular importance in the implementation of the principles of spatial development policy, promotion of tourism

environmental quality of regional and international significance.

In order to promote interdisciplinary cooperation across international borders (onshore and offshore) for the efficient application of geoscientific information in environmental planning, ecosystem monitoring and environment impact assessment in cross-border areas the Working Group on International Borders – Geoenvironmental Concerns (IBC) has been established by the IUGS Commission on Geological Sciences for Environmental Planning (COGEOENVIRONMENT) 23rd October 2002.

Objectives of the IBC:

- to increase awareness of the relevance of geoscience to land use planning, subsurface resources management, and sustainable development and management of cross-border areas.
- to inform planners, managers, developers, policy makers, lawyers and other appropriate groups concerned with cross-border areas of the importance of geoscience to their activities and interests;
- to develop practical and user-friendly geoscience-based approaches, techniques and models for use by all involved in cross-border environmental management issues;
- to inform and/or train geoscientists on the use of these approaches, techniques, and models in relation to planning, land resource management and sustainable development of cross-border areas;
- to draw together the geoscientists of neighbouring countries where the current level of activities is different.

The geoconservation is one of very important field of the cross-border geoenvironmental cooperation. This includes identification of geological heritage, compilation of joint data bases, geotouristic maps and other activities that could contribute for promotion of better understanding of and protection of the geological heritage.

An important milestone of activity of IBC will be an General Symposium "International Borders and Geoenvironmental Concerns", included into the programme of the International Geological Congress, August 2004, Florence (Italy). The symposium (G - 3.11) will include oral and poster sessions and panel discussion. All interested in development of cross-border cooperation in the field of environmental geology, including geocoervation, are kindly invited to contribute to this Symposium.

A QUESTIONNAIRE (see below) , is developed and aimed to identify cross-border existing and potential problems related with geoenvironment. Incoming data will be very useful for planning of activities in the IBC, such as workshops, publications or projects and similar. You will be invited to join these activities. Any use of the data will be properly acknowledged.

J.Satkunas, M.Graniczny

New look for ProGEO NEWS

Due to changes in software and computer, the lay-out of ProGEO NEWS has changed. You will now find it more like the layout of the web-version of the newsletter which you will find on the ProGEO homepage.

The editor

QUESTIONNAIRE

Identification of cross-border existing and potential problems related with geoenvironment

1.	Most important geoenvironmental issues existing in the cross-border area.	yes*	no
2.	Ongoing cross-border geoscientific cooperation activities (results and practical application).	yes*	no
3.	Existing cross-border monitoring systems (groundwater etc.).	yes*	no
4.	Capacities of geoscientific contribution to regional development (e.g. Euroregions).	yes*	no
5.	Frameworks of inter-institutional cooperation, legal frameworks, Transboundary agreements.	yes*	no

*If "yes", please give short information

Return please this QUESTIONNAIRE to:

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The Dniester River Valley A Geopark candidate in Ukraine

Introduction.

This paper represents the Dniester River Valley as one of most important georegions of Ukraine. It is based on the National Geological Monuments List (Zaritsky, 1985). Now the State Geological Survey of Ukraine develops this list by sponsoring a national geological prospecting (scale 1:200 000) and at the same time searching, exploring and describing new geosites in order to compiling a national data base.

The Dniester River Valley have many different potential geosites candidates for the International Union of Geological Sciences global inventory of the Earth's geological heritage, or GEOSITE database (Johansson et al., 1998). We work to identify areas of special geological interest, which by conservation and management will contribute to the conservation of the national as well as European geological heritage. Most of the geosites represent are of stratigraphical importance. The key Vendian and Silurian sections were studied and



Fig.1. In the Jampil sandstone plates numerous imprints of softbody Vendian fossils were found: "Nemiana", "Tirasi-ana", "Medusinites" and others. The picture shows a very good preserved examples of their settlement. Here both positive and negative casts are present. From a quarry created near the Yaryshiv village.



Fig.2. The Yarouga regional series correspond to the Wenlockian and Ludlovian of the International Stratigraphic Chart. This outcrop show bedded nodular limestones of the Ternava Formation and a hard plate of limestone from the lower part of the Bagoviitsa Formation. Right bank of Ternava river near its mouth.

described by Velikanov et al. (1983) and Tsegelnyuk et al. (1983). Almost all valleys from Yampol village up to Ivane-Zolote village has beautiful exposures almost without interruptions.

The Dniester river canyon is partly flooded by reservoir waters. Its depth reaches near fifty meters at its maximum. Many of the stratotypes and geological sequences are thus covered by water, but others still remain visible. Additionally erosion by the waves in the reservoir is creating new exposures. The special geological and geomorphological setting allows different type of geosites to be identified.

- Stratigraphical geosites (stratotypes of regional series, Formations, sub-Formations and international parastratotype of boundary between Silurian and Devonian).
- Other geosites represent paleontological localities with fossil fauna and flora which give us information on development of prehistoric life.
- Some mineralogical geosites (for instance, N631: outcrops of Vendian deposits which contain concretions of phosphorite with ore mineralization).
- Karstic geosites with caves.

Historical background

In the middle of the 19th century geological investigation of Upper Silurian and Lower Devonian of this region began. It was connected with the investigations of St. Staszic, E. Eichwald and K. Malevsky, whose results were summarized by R. Kozlowsky (1929). There were studies in pre-Skalian deposits and its fauna (Wenjukov, 1899). Regular and extensive examina-



Fig.3. Outcrop of the upper part of the Malynivtsy regional series. The green vegetation belt is connected with springs which flow from the cover of volcanic ash beds (now bentonite clays). The left bank of Dniester river near Malynivetska Sloboda village.

tions of the oldest sedimentary rocks started in the 1920-1930s. For a long time this was a field of interest mainly for Russian and then Ukrainian scientist (Tsegelnyuk et al., 1983, Drygant 1972 and others). An international geological significance of this region has recently been more evident because of:

- the occurrence of large outcrops which represents different facies and abundant high quality fossils,
- the almost total absence of folding, weak influence tectonic breaks and metamorphism,
- the general development and need for international cooperation.

New projects are developed, for instance a Grate Britain NERC project directed into Vendian environments.

Geomorphological conditions

The region generally corresponds to the Podolian uplands. The relief is characterized by slightly hilly plains, highly hydrographically dissected with gullies. The upland declines to the south and the relief can be characterized by a combination of vast flat interfluvies and canyon-like valleys oriented almost meridional and falling towards the Dniester River. A ridge called the Tovtry hills is an important element of the landscape east of Kamianets-Podilsky. This fossil barrier reef of the Middle Miocene Sea forms a whimsical strong rock formation very resistant against weathering and destruction.

Geological setting

The area belongs to the south-western and western slopes of the Ukrainian Shield. Geologically the Middle Dniester area corresponds to the Podolian edge of the south-western part of the East-European Platform or Podolian plate. Sedimentary complexes are separated

one from another by regional unconformities. All complexes are developed as monoclines on the west Slope of the Ukrainian Shield. The Vendian unit inclines westwards and south-eastwards at an average angle of 20 up to 50. The Khmelnytskyi Formation (Cambrian) is represented by a glauconitic sandstone outcropped near the Kytaigorod Village. The lens-like bodies of the Ordovician are represented by two (Goraivka and Souboch) formations of the Molodove Regional series (before named as Molodove horizon) with a total thickness less than ten meters.

Especially important is the sequence from the Silurian (except the Llandoveryan) up to the Lower Devonian, which represents the most complete section of these units in platform facies in the world. Only the Silurian total thickness varies from 295 to 470 m. The Lower Devonian is represented both by marine facies (Tiverrian Regional Series – 300-400 m) as well as terrestrial ones (Dniestrovian Regional Series – near 500 m), corresponded to Late Lochkovian-Lower Emsian. There are terrigenous beds of “Old red sandstone” facies which contain Placoderms. Mezo-Cenozoic complex is also represented by the Albion-Turonian deposits (flints, silicilites, limestones) separated by a hiatus from Neogene (clayey deposits and limestones). Alpine complex has practically horizontal bedding.

Geosites of Silurian part of the Silurian - Vendian Sequence

The middle part of the Dniester river basin covers the Khmelnytskyi, Tchernivtsy and Ternopil districts of the Ukraine and is characterized by a platform type structure of the Earth's crust. The crystalline Archean-Proterozoic basement exposes in the eastern part of the Podolian plateau. Non-metamorphosed sedimentary cover consists of the Vendian (fig.1), achieve up to 400 m thickness, Lower Cambrian (up to 120 m), Mid



Fig.4. A special rolling texture in “old red sandstone” deposits of the Dniester Regional Series near the Ivane Zolote village. Right bank of Dniester river.



Fig.5. Soil slide near the Khoudykvitsy village from the left Dniester valley slope represent geological process diversity.

dle-Upper Ordovician (up to 6 m), Silurian sequence thickness up to 450 m (fig. 2, 3), Lower Devonian sections account near 900 m of sediments (fig. 4) and Mezo-Cenozoic (up to 30 m).

Conclusions

At present, many scientists and geologists propose to include the Valley of Dniester River to the European list of Geological Heritage (Gritsenko et al., 1995, Wimbledon, Gerasimenko et al., 1999). In addition, we propose to create an European Geopark here, based on the described Geosites and the general geological quality of the area which includes specialities of high European interest. The territory is close to the Dniester Valley and form a narrow band of nearly 200 km length. The variety of the area attracts many visitors. The concentration of more than fifty geosites represent different types of Geosites such as Stratigraphical, Paleontological, Paleoenvironmental, Sedimentary-Lithological, Mineralogical, Tectonical, Geomorphological, Hydrogeological, Volcanic, Geo-Archaeological, Geo-Cultural, and Geo-Economical. The middle Dniester river valley is of great interest and potential for Geological and Natural History education. The region is an arena where geo-hazard processes are common: land-slides, mud-slides, stream rise (fig.5) is occurring frequently and in some places human disturbances (soil and water pollution and consequence effects) adds to this in a way has great educationally potential.

We will propose that the next ProGEO conference in 2006 could be held in the Kyiv with a field trip visiting the best Ukrainian geosites in the beautifully Dniester river basin.

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Volodymyr P. Grytsenko



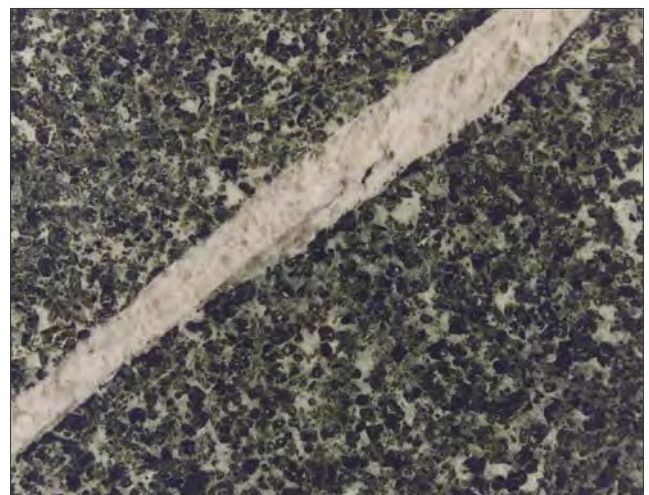
Čizlakite – a petrologic curiosity from Slovenia

On the southern slopes of Mt. Pohorje in the northern part of Slovenia, at the Čezlak village near Oplotnica, a locality with a dark-green grainy igneous rock occurs. This rock was studied before the Second World War by the mineralogist and petrographer Prof. Vassily Nikitin. According to its composition, the rock was not described before.

It was named **čizlakite**, after the neighboring village. It belongs to the gabbro group and consists of light-green augite, hornblende and plagioclase feldspars, but also some orthoclase, biotite, quartz, epidote, chlorite, pyrite and a few other minerals. The rock occurs in the form of an irregular lense with the size of about 250 x 110 x 100 m in the enclosing granodiorite. The composition of the lense is not very homogeneous. The proportions of the various minerals, their sizes and secondary alterations are variable. The rock is cut by aplite veins of various thicknesses. Dating by potassium-argon method indicate that the čizlakite was formed about 18 million years ago.

Owing to its noble dark green color, excellent stone-cutting properties and applicability, čizlakite is one of the most beautiful natural stones of Slovenia. Its beauty comes best to expression in the interiors of buildings, where it is protected from atmospheric agents. Its production started in a limited extent at least 160 years ago. Among other stones, čizlakite has been used for the decoration of the façade of the Slovenian parliament building. It would be appropriate to protect a part of its outcrop as a natural monument.

Jože Vesel, Andreja Senegačnik, Rajko Pavlovec



IUGS meeting in Utrecht

The IUGS convened an invitation-only meeting in Utrecht on 28-29 November. This meeting was advertised as a brain-storming session with the objective of promoting geotourism.

The meeting included officers of IUGS, an officer from UNESCO, one from the International Union of Geographers, with all the rest individuals from single countries, including China, Namibia and Malaysia. ProGEO was the only NGO or geoconservation NGO present: and it was represented by the President and Executive Secretary.

We are still thinking over what the meeting in Utrecht meant and means, but we are sure we can say that after the Utrecht nothing is changed for our association. The content of the meeting was to promote a new IUGS way of thinking, or, more correctly, to provoke actions in others, on geoparks and geotourism, but after two days of discussions the "-why, -what, -where, -who does what" and especially "who pays", were not explained.

We for ProGEO spoke of the range of activities that our association has done and what is done also in the countries, for we are an NGO and the countries are paramount. We also stressed that we will continue with our own programme, including geosites, trails, tourism, education etc, following aims set in our publications, articles, leaflets and at our four International Conferences.

We agreed, as we have always agreed, that geotourism is a very good thing in the right setting. The aim of the IUGS hierarchy at the meeting was to promote

tourism and that through the channel of geoparks. But geoparks were described by others at Utrecht as several things, and there was some disagreements and friction over definition, choice, control, authentication, rules etc. We were not in that argument! It was mentioned that UNESCO's council had not accepted geoparks as a programme and there was no funding. Disappointing, when ProGEO first lent its support for the idea at its 1998 Belogradchik conference.

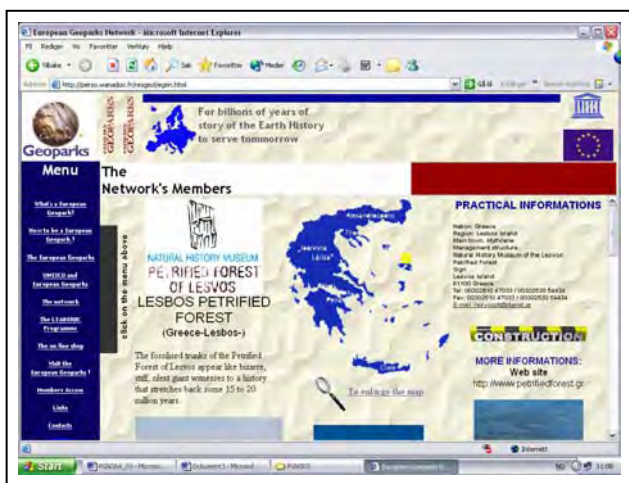
There were mentions of restrictive methods being used. One person called the European geopark group a "private club", others complained that the UNESCO method was bureaucratic and ineffective thus far. Some promoted freedom and independent country-generated geoparks. We heard Germany is keen on that idea and people there already have created their own. That is something our members already work on.

At the end, for us, it not clear what the role for ProGEO will be in any meetings/programme, probably it will become clear from the next meeting in Peking. During the meeting we underlined what has been and what will be the activity of our association. We were at pains to stress that geoconservation involves many things and not just exploitation of touristic focuses. At present there is, at different scales, the necessity to promote geology, protection and the geoparks: geotourism could be a one good manner to promote education in geology towards citizens of different ages.

In Utrecht, we supported this tourism mechanism, of course, but found little support for the idea that there is a bigger picture and that touristic focuses do not cover all the many sites that are of value and worthy of protection. We opposed the strange idea of IUGS to define the use of words and try to impose these on all: There are more productive things to work on. It was also necessary to say several times that all countries already have both laws and cultures and they cannot be dictated to, by IUGS or any NGO.

It is clear for us that also a variety of geosite-, geopark- and natura-I and national park projects can all contribute in parallel to the same kinds of targets. And research goes on and we must take into account this advancement in protecting 'new' heritage. And sustainable management of sites is not to be forgotten.

ProGEO was and will be in the IUGS thoughts, and will give its contribution, if it is requested, but it is also very clear that we have many serious activities and researches of our own to develop, that we know to be good programmes, and these allow us to be present in IUGS and in other international structures.



The home page of the European network of Geoparks, one of the major geotourism initiatives in Europe over the last years.

Decisions made in Utrecht were as follows:

- IUGS do not intend to form a new constituent IUGS body for geoconservation. IUGS officers stated that was not their intention - separate or under COGEOENVIRONMENT
- But it was agreed by those in Utrecht to form an independent "consortium", the word used, of all interested groups. This includes ProGEO for Europe.
- ProGEO was recognised as the organisation representative for Europe. Invitations for the next meeting will be sent to relevant international bodies, not just those in Utrecht.
- It was suggested, by others, that there needed to be a ProGEO for other Continents
- The consortium should meet at a geotourism meeting already scheduled in China in June 2004.
- To get the independent consortium started, IUGS will (initially only) contribute \$5000 to cover meeting costs, and it hopes IGU and UNESCO may do the same.
- There are three definitions of geoparks, none of them official or governmental: UNESCO geopark, the European geopark (allowing one or two per country), and the country geoparks that all are free to choose and promote. All may pursue their own definition of geopark!

F. Zarlenga (President) & W.A.P Wimbleton (Executive secretary)

New Newsletter from Serbia

The Institute for Protection of Nature of Serbia are now sending out a newsletter in English. The Newsletter contains information about activities of Institute and actualities in the nature conservation in Serbia (researches, actions, publications, projects, seminars...). If you want to see the newsletter contact the Institute for Nature Conservation of Serbia, nature@net.yu.



Lidija Amiszc

Geoconservation and biodiversity in Belarus.

In Belarus a booklet was published last year in the series: natural (geological) monuments and within the framework of the implementation of the national strategy on preservation and sustainable use of biological diversity. The booklet was published by the Ministry of Natural Resources and Environmental Protection in the form of booklet, basically for internal use, but it has also been distributed externally. It contains a small text about geological natural monuments in our country and 20 photographs.

Natural monuments include unique non-renewable, ecologically, scientifically, historically and aesthetically valuable natural complexes and objects with the area they occupy. Botanical, hydrological and geological natural monuments are distinguished depending on the features of a protected objects.

Geological natural monuments (outcrops of glacial and interglacial deposits and bedrock, typical landforms, large boulders and their accumulations, other geological objects) are an important part of our heritage. They must be protected to ensure further development of the biological, geological and other Earth's sciences and for the understanding of the natural history of the country. To protect the natural heritage 875 natural monuments of national and local importance, 511 of them being geological monuments, have been recognized. Administrative bodies of the Ministry of Natural Resources and Environmental Protection of the Republic of Belarus exercises control over the protection and utilization of the natural monuments according to the Law.

The life is manifested in diverse forms and provide for the natural wealth and inimitable beauty of every site of our country due to a long evolution process associated with geological events. The territory of Belarus shows a complicated and exciting geological history. The arctic tundra with dwarf birch and polar willow faintly visible under the moss and sedge cover, and inhabited by mammoths and other arctic animals was formerly spread in places, where forests are growing today. During the last million of years such glacial epochs were repeated more than once replaced periodically by warm periods with natural environment very similar to the present-day one.

During the glaciations the area was situated mainly in the marginal zone of the ice sheets. It resulted in a widespread occurrence of very thick (up 340 m) glacial deposits, and many large and small erratic masses, glacial boulders and intricate landforms. Just these formations are the main natural features that are re-

sponsible for the country's morphological aspect and peculiarities. The last glacier retreated from the area about 17-18 thousand years ago and left hills, deep valleys and lake basins together with vast plains. However, its influence upon the plant and animal life was still evident for 10 thousand years. The present-day landscapes formed gradually. Forests replaced bogs and vice versa, meadows became larger or smaller, rivers formed vast valleys, lakes were filled and turned into bogs. Plant and animal communities found the most favourable conditions for their existence, and habitats were created and preserved, but are now changed by man.

This is a very schematic picture of the natural environment evolution aimed to demonstrate that the modern

biological diversity appeared as a result of processes closely associated with the geological history. The relief and surface deposits are parts of the biogeocoenoses, where the modern plant and animal life of Belarus was formed and developed.

Rock outcrops are of special scientific biodiversity importance as they are closely associated with the evolution the ecosystems. Among them there are deposits of old water bodies exposed in the river banks, slopes of ravines or quarries. Similar rocks show well-preserved plant remains (pollen, seeds of herbaceous and arboreal plants, fruits, microscopic green, brown and diatom algae, etc.) and animal remains (mollusk shells, mammal bones, chitinous fragments of insects, etc.). These may be used to determine the geological age of formations, to gain insight into the plant and animal life of that time, to trace the flora and fauna evolution trends in the past and also predict their changes in the future. These deposits constitutes only 5% of glacial strata but are very important to gain a better understanding of geological and biological processes operating over the Earth.

A typical feature of natural landscapes in our country is the abundance of erratic boulders: large, rounded and soled rock fragments more than 10 cm across. The most interesting boulders are preserved as natural monuments. These are valuable relicts of glacial epochs and geological processes. The composition of these old stones and their distribution pattern are used to locate sites, which boulders and other rocks were delivered from, to reveal the ways of movement of glaciers and their maximum limits, to forecast mineral deposits, to correlate distant geological sections. Moss, lichen, fern, etc. grow sometimes on the surface of boulders, these latter may therefore contribute to biological diversity and serve as a lithosubstratum for rare and endangered species.

*V. Vinokurov and F. Velichkevich, Translated by V. Filippova.
Responsible for the booklet: V. Korenchuk.*



Reminder

Remember the topical symposium " T-17.04 Geology - maker of cultural and geological heritage: geosites under threat", at the IGC in Florence, the first independent geoconservation symposium of its kind.

Deadline for abstract submission to the IGC organisers is on the 10th of January 2004!

Submit abstracts on paper on the IGC form (available from casaitalia@geo.unifi.it,) or, electronically on <http://www.32igc.org>.

A new book on Geodiversity

"Imagine, if you can, a very uniform planet. A planet composed of a single monomineralic rock such as pure quartzite. A planet that is a perfect sphere with no topography and where there is no such thing as plate tectonics."

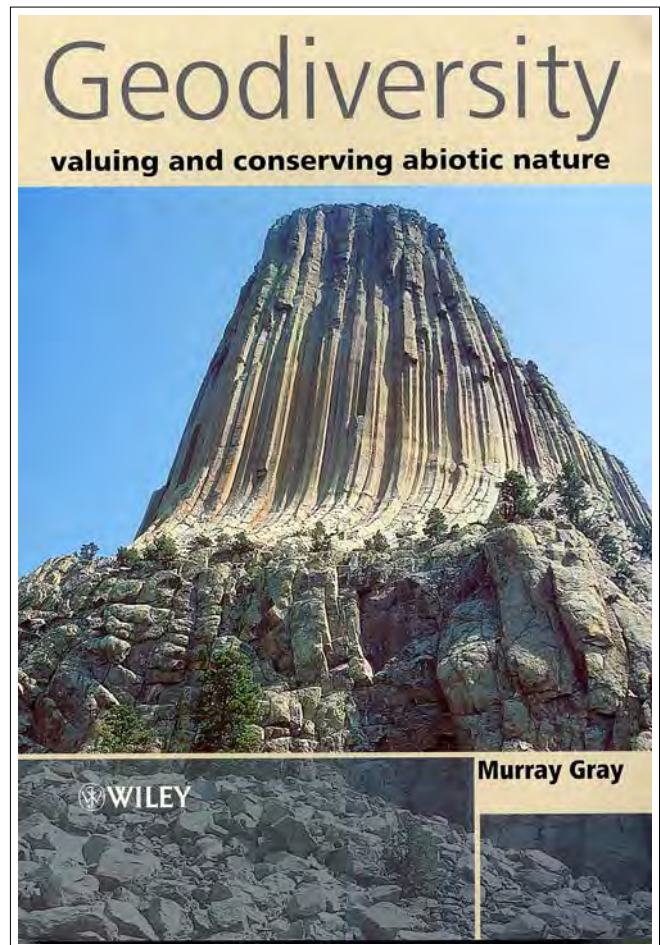
This is the start of a new book written by Murray Gray and published by Wiley: *Geodiversity – valuing and conserving abiotic nature*. It is strange that it is necessary to justify the importance of geodiversity – in many ways it should be obvious. Having said that, Murray Gray does it with brilliance, not only to convince "non-believers", but giving inspiration to us that have worked within geoconservation for a long time. Inspiration to continue the work, and inspiration to adapt new angles in our perspective and testing new approaches.

Indeed it is a major event for geoconservation when a new textbook in our field is published. The field of geoconservation is rather fragmented in its documentation, even if ProGEO over the last years has improved the situation at least within Europe. We do not have to go far to see the consequences of this. The field is thought of as marginal both within, as well as outside the geosciences. The book is a major contribution to fill this documentation gap.

A lot of examples and references can be found in the book, not only within the strict field of geoconservation. The geological foundation to the diversity and the close links between geodiversity and biodiversity is also discussed as well as the diversity of recourses. It has different chapter covering the definition, description and valuing of geodiversity as well as the threats to geodiversity.

A long chapter covering different approaches to conservation is followed by examples of new approaches for managing geodiversity for the wider landscape and comparing and integrating geodiversity and biodiversity. A small but interesting little chapter concludes the book: *Towards a Vision for Geodiversity Conservation*.

Murray Gray writes about a dilemma for geodiversity: on the one hand the subject needs to establish itself as a distinctive, independent and essential field of nature conservation, but on the other there is a growing need and trend towards an integrated approach to nature conservation incorporating geological and biological systems. This may perhaps not be a dilemma; it



may be possible to say with Winnie the Pooh: yes thank you, both. These two approaches may strengthen each other and the fact that we can see and plan for integration is a sign that the field moves towards maturity. We need to accept the diversity of approaches, cooperation and thinking.

The book is recommended, not only to geologists. I myself have ordered a couple as a gift to my contacts within the Norwegian nature conservation (ecologists) in the hope that it will give them something to think about in the years to come.

Gray, M. 2004. Geodiversity – valuing and conserving abiotic nature. John Wiley & Sons: 434pp.

Lars Erikstad

Deadline next issue of ProGEO NEWS: 01.03 2004

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