ProGEO NEWS

No.3 1999

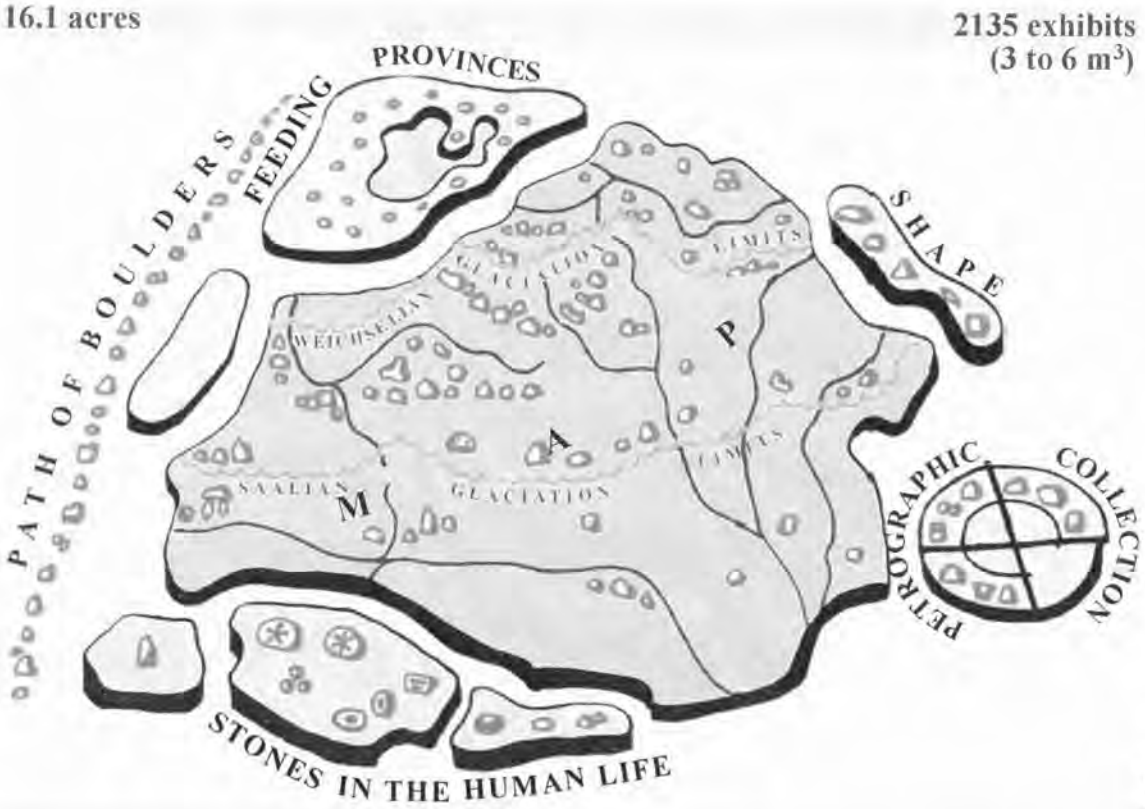
The Belarussian Park of Stones, The Institute of Geological Sciences NAS of Belarus in the background.

Belarussian Stone Park

An unique monument of nature

Landscapes are permanently changing, humans eliminate from their point of view, useless landforms - hills, ridges and similar, regarded as obstacles for people's economic activities. Glacial boulders are a target of an especially intensive extermination because they hinder land cultivating, construction of houses, etc. An establishment of a Stone Park was conditioned by the intensive anthropogenic impact and thus the threat to these boulders.

Boulders are referred to as relics of glacial epochs and processes that occurred in the areas of ancient continental glaciation of Europe. They are character elements of the natural landscapes of Belarus. During the last 0.8 million years the territory of the country has been influenced repeatedly by continental glaciations, which left thick deposits. The glaciers brought a tremendous amount of debris of crystalline rocks belonging to Archean - Proterozoic complexes of Mid Sweden, Åland and other Baltic islands, Southern Finland and Karelia. The spectrum of erupted and metamorphic rocks of mentioned complexes is wide. It includes granites, granodiorites, diorites, syenites, gabbro, pyroxenites, diabases, porphyry and porphyrite, gneiss, crystalline shale, amphibolite, quartzite, etc.



Map over the stone park

These rocks compose boulders related to the last three glaciations. Boulders brought by the Saalian (Dnieper) Glacier are common in the Southern Belarus. Boulders in the Central and Northern parts of the Country originate from the Sozh (stage of Dnieper Glacier) and Weichselian (Poozerie) glacier activities correspondingly. Study of boulder composition and regularities in their distribution allows to determine the feeding provinces as well as to obtain more specific information about the direction of ice flow and the borders of maximum glacial extend. Investigations allow to find similarities between the relief pattern and it's origin, as well as to correlate remote geological sections, to specify the directions of glaciers' motion and limits of their spreading, and to forecast locations of mineral deposits. The majority of glacial boulders contain nickel, chromium, cobalt, vanadium, copper, magnesium, titanium and other microelements. The amount of these elements in boulders are tens times higher than in surrounding soil. Therefore boulders being as a natural concentrators enrich the soil with microelements. There are mosses, lichens, and even algae (some of them belonging to relict species) can be found on the boulders.

In the early 70´s academician G. Goretsky paid an attention of specialists to the fact that amount of boulders on the surface decreases every year. Moreover the most endangered boulders are those which possess the greatest value in terms of their composition, shape and historical and ethnographic importance. Many people have understood the dramatic state of these specific elements of Belarussian landscapes. Goretsky put forward and stood for an idea on creation of a geological museum in open air. He proposed to preserve the most valuable stones in such a museum. A search expedition was established in the Institute of Geological Sciences in 1977. It was equipped with special machinery (trucks and cranes). The main task set for the expedition was to find, study, select and ship to Minsk the unique glacial boulders. The author was a head of that expedition during six years, being involved immediately in collection of samples. Carrying out this big task met a lot of difficulties, because a job like that had not been done in the country before. First of all the rational search for the interesting objects was organised. In winter time the archive materials and literature related to future objects and areas of investigation were studied. Processing of recent and historical materials on topography allowed to make up preliminary lists of objects of investigation and to narrow the area for search. The oral information from local villagers on the locations of boulders made a good contribution to the data collected. It allowed to study and select some interesting exhibits.

The boulder material is distributed irregularly on the surface. The gatherings of boulders are drawn in general to the frontal moraine landforms, which are the locations of glacier stops. The total volume of surface boulders is approximately equal to 10 million m^3, and the stony areas covers only 9.4 % of the country. In the same time the

stony areas occupy up to 18% of some regions (in Minsk region for example), and up to 68 % in some districts (Miadel district). Such areas cover 15% of Grodno region, and 71% of Diatlovsky district. The stony areas occupy only 1% of southern regions of the country, because they are situated far from the glacier edges.

Some of the expedition members (V. Vinokurov, E. Runets, 0. Zimenkov, etc.) became familiar with additional professions and got rigger professional skills. As a result, geologists worked on not only search and study of interesting boulders, but also loaded them on trucks using cranes. On the first stage the boulders (the weight of some boulders reaches 10-15 tons) selected in different regions of a country were moved to Minsk by trucks. But this led to the big time losses. Therefore it was decided to accumulate boulders at the railroad stations, and to deliver them by special platforms to Minsk. 47 railway platforns loaded with boulders were delivered to the museum.

In order to preserve boulders and taking into account their scientific importance the Stone Park was opened in 1985 at the Institute of Geological Sciences NAS of Belarus (the first part of Experimental base of glacial boulders or Geological Museum in the open air). The Park exhibition is situated in the Eastern outskirts of Minsk (Uruchie microdistrict) in the area of 16.1 acres. It includes 2135 exhibits of the main exposition. The scientific concept of exposition was elaborated by academician G. Goretsky (the head of a team), S. Astapova, V.Vinokurov, academician R.Goretsky, Ev. Runets, R. Shempel, E.Levkov and others. The Park territory itself is a complicated engineering structure. It includes drinking and watering water supply systems, rain sewerage, electric lighting system. The territory is greeneried with grasses, bushes and trees.

The Park of Stones consists of 6 sections (architects R. Knauer, R.Baranovsky, L.Saurova, T.Vlasava). The central exposition, "the Map of Belarus" (11 acres) represents the model of geographic map of the country with horizontal scale 1:2500 and vertical scale 1: 100. The Map shows the major frontal highlands, planes, lowlands, river network (represented by paths), and two pools (simulating Naroch Lake and Zaslavskoe man-made reservoir).

The highest hills (up to 3.5 meters) represent the Minsk Highland with the highest altitudes of the country Dzerzynskaya (Sviataya - Saint) Mount and Lysaya (Bald) Mount, 346 m and 342.7 m above the sea level accordingly. The smaller hills show the other main highlands: Grodnenskaya, Novogrudskaya, Oshmianskaya, and so on. The chain of stones (0.5 - 0.8 meters in diameter) marks the limits of two last glaciers distribution. They divide the territory of Belarus into three regions: Poozerian, Central Belarussian and Polessian. The boulder material of each region reflects a composition of three different glacial flows (North-Westem, Northem and North-eastem). The feeding of these flows was carried out from the centres of the glaciations in Sweden, Finland and Karelia.

Peculiarities of petrographic composition of each glacial flow are reflected in the composition of boulders. The rocks of Sweden and Baltic feeding province are predominant ones in the North-Westem region, of Finish province - in Central

A specimen of a land-mark stone. Belarussians carved such signs approximately 2 – 2.5 thousand years ago on the land-mark

region, and of Karelian - in Eastem region. The 'Map" shows more than 600 boulders arranged according to geographical characteristics (the volurne of boulders ranges from 5 to 6 cu.m, the weight - from 10 to 12 tons). The gatherings of boulders are common not only for the frontal highlands, but also for the moraine plains. The peculiarities of distribution of boulders within such planes are shown on an example of Pribugskaya and Central-Berezinskaya lowlands. An exhibition of area "Pribugskaya lowland" is arranged as an oval composition of boulders with three stones in the centre grouped as a gate. There were a lot of structures like this within the territory of our country. They were formed due to the process of glacier degradation. The analogous structure remained near the city of Vyborg in Leningrad region in Russia. Initially the boulders were situated in the ice body as raisins in a bun, and than after ice melting they formed such a composition. There are index-rocks from Northern Sweden, Åland Islands and from the bottom of Baltic Sea predominant here. An exhibition "Central Berezinskaya Lowland" composed of the number of concentric boulder strips and large stone in the centre. Shales and other rocks common for the Southern and Central Karelia are frequently met here. The Map is oriented to the part of the world, and its borders are underlined by the short bushes.

The other 5 sections surround the central exhibition.
The exposition 'Teeding Provinces" displaying the source of boulders - Fennoskandia, Baltic Sea and Finnish Bay occupies the northwestem corner of the Museum. The Baltic Sea with Botnic and Finnish Gulfs is shown as a U-shaped deepening in the middle of the flat area. The contours of deepening are followed by boulders. So-called index-boulders are represented here. They consist of rocks which occur in situ within defined and limited in area sites.

The 'Tetrography Collection" section is situated in the south eastern part of the Park. It is arranged as a circle surrounded by a pathway. Magmatic, Sedimentary and Metamorphic boulders allocated in separate sectors of a circle. Such an arrangement of exhibits symbolizes a circulation of matter in the Nature, that led to the forming of these rocks. Rapakivi granites are remarkable ones among the magmatic rocks. The size of feldspars in rapakivi granites indicates their origination from different feeding provinces. The sedimentary rocks are characterised by representatives from quarts sandstone's, boulder conglomerates and karelian shales. Metamorphic rocks are presented by migmatites, gneiss, and quartzites of different types.

The exposition named "Shape of Boulders" in the eastern part displays a variety of boulder shapes. Glacial boulders amaze by diversity and uniqueness of their shape. There is ironshape, round, flat and convex boulders, with hatching and polished one or two edges in the exhibition. A number of causes influence condition the final shape of a stone. The first of them are an initial shape of debris before the glacial processing. Glacial processes affect more strongly the edges of boulders. Change in the shape is a slower process, depending on the rock properties (hardness, bedding, brittleness, granularity, etc.). The shape depends also on the distance and conditions of boulder transport in the glacier body.

The section "Stones in the Human Life" is situated in southern part of the Park. It shows original cult stones and boulders used by people: stone with signs (1 AC), idol-cross (IX - X AC), Stefan Batory Cross (XVI century), millstones (XVIII - XIX centuries), stone - defender (amulet) (XIX th century) and others.

"Boulder Alley", situated in the western part of the Park is the main pedestrian path connecting transportation stops, Uruchie Microdistrict and the Institute. The Alley is a sense continuation of previous section. The scenic view of a Park with hills, planes and scattered different in shape, composition and colour boulders is seen by one side of Alley. The other side is followed by the sinuous chain of large round and flat boulders. In some places the chain makes glades with large stones in the centres. The stones are raised above the surrounding exhibits. These stones will be supplied with bronze bas-reliefs, displaying the scenes from folk legends (sculptor V. Januslikevich). More than hundred such legends about turns of people, animals and even villages into boulders are still alive in different comers of our country.

The Experimental base has been established to study glacial boulders, to help in solving a number of geological problems, to find the ways of efficient use of boulders, and to popularise geological and local lore knowledge. The Base has had a status of Nature Monument of State significance since 1989. Perfection and widening of Park exposition is hindered currently because of economic crisis in the country. Nevertheless there are detailed programs and actions targeting future development of the Park elaborated and available. For example, it is planned to build rest areas with benches and litter receptacles, to set up pointers and schemes showing an arrangement of exhibits, names of rocks, etc.

V. Vinokurov
The Institute of Geological Sciences NAS of Belarus

ProGEO **Important web-sites**

http://www.sgu.se/progeo/

http://www.tilesa.es/progeo/

http://www.snh.org.uk

Conference

Earth science and the natural heritage: interactions and integrated management

Scottish Natural Heritage's 7th Annual Conference , 4-5 November 1999, Dynamic Earth – Edinburgh

The rocks, landforms and soils of Scotland are linked closely with most other aspects of the natural heritage. They form the basis of our distinctive landscapes and provide the diversity of habitats for our biota. Physical processes drive many habitat changes, as in river and coastal environments. They also moderate other reactions and energy flows that impinge on ecological processes, as in the retention or release of pollutants in soils. Rocks, landforms and soils constitute an economic resource that is utilised by the minerals industry, for food and timber production, and for recreation, tourism and education.

At a time when interest is growing in sustainable use of natural resources, landscape interpretation, geotourism and integrated management based on a knowledge of physical processes, it is timely to address more explicitly the broader links of the earth sciences to ecosystems and landscapes. In addition, the earth sciences have practical value in resource management, land management, local authority planning, environmental education and geotourism.

This conference will, for the first time, bring all these issues together under the common focus of sustainable and integrated management of our natural heritage, for the benefit of practitioners and decision makers.

Conference programme

Thursday 4 November
0830-0930 Registration
Session 1 Opening
0930 Welcome and Opening address
0945 Keynote address - Biology and the earth sciences: a new synthesis
Professor Aubrey Manning (Professor Emeritus of Natural History, University of Edinburgh)
Session 2. Earth science and natural heritage: the links
1015 The geological inheritance of Scotland
Dr Nigel Trewin (University of Aberdeen)
1040 The landscape inheritance of the Quaternary
Professor Geoffrey Boulton (University of Edinburgh)
1105 Coffee
1135 Montane landscapes in Scotland: are these natural, artifacts or complex relics?
Professor Colin Ballantyne (University of St. Andrews), Professor Des Thompson (SNH) and Professor John Birks (University of Bergen)
1200 Freshwater environments
Professor Chris Soulsby (University of Aberdeen) and Dr Philip Boon (SNH)
1225 Coastal environments
Dr Jim Hansom (University of Glasgow) and Stewart Angus (SNH)
1255 Discussion
1305 Buffet lunch and posters
Session 3. Sustainable use of Earth resources: pressures and management approaches
1400 State of the Earth heritage in Scotland: pressures, trends and issues
Dr John Gordon (SNH) and Dr Colin MacFayden (SNH)
1425 Sustainability and use of minerals resources
Ian Lindley (Tarmac Quarry Products Ltd), Alan McKirdy (SNH) and Andrew McMillan (British Geological Survey)
1450 Sustainable use of soils
Dr Toby Willison (The Scottish Executuive Rural Affairs Department), Dr Geeta Puri (SNH), and Dr Paula Woolgar (Scottish Environment Protection Agency)
1515 Sustainable use of freshwater resources
Dr Katherine Leys (SNH) and Ian Fox (Scottish Environment Protection Agency)
1540 Discussion
1550 Tea
1620 Coastal and marine resources
Dr George Lees (SNH), Dr John Baxter (SNH) and Professor John McManus (University of St Andrews)
1645 Climate change and its potential implications for Scotland's natural heritage
Dr John Harrison (University of Stirling) and Dr Hilary Kirkpatrick (University of Stirling)
1710 Energy
Howard Johnson (British Geological Survey) and Dominic Counsell (SNH)
1735 Sustainable use of Earth's resources
Professor Roger Crofts (SNH)
1800 Discussion
1815 Tour of Dynamic Earth
1915 Reception and buffet supper

Friday 5 November
Session 4. Earth awareness and education
0915 Development of integrated educational resources: the Dynamic Earth experience
Dr Stuart Monro (Dynamic Earth) and Dee Davison (Dynamic Earth)
0940 Millenium connections: fostering healthy earth science education and industry links
Jim Milross (Mining Association of British Columbia Education Program)
1005 The role of geotourism
Alan McKirdy (SNH), Rob Threadgould (SNH) and John Findlay (John Findlay Associates)
1030 Landscapes from Stone
Dr Patrick McKeever (Geological Survey of Northern Ireland)
1055 Discussion

1105 Introduction to Workshops and Aims
1115 Coffee
Session 5. Key Issues for the 21st Century: Workshops
1140 Parallel workshops on:
1. Sustainability and minerals development
2. River and floodplain management
3. Coastal management: defend or abandon?
4. National Soil Protection Strategy: Scottish perspectives
5. Earth science education: resources and needs
1245 Buffet lunch and posters
Session 6. Key Issues for the 21st Century
1400 Reports of workshops
1450 Discussion: Earth heritage in the 21st century - developing a strategic plan for Scotland
1530 Tea
Session 7. Synthesis
1600 Synthesis
Professor Michael B Usher(SNH)
1630 Closing remarks

Saturday 6 November
FIELD EXCURSION -EDINBURGH AND FIFE
The purpose of the excursion will be to demonstrate and discuss examples of management issues and solutions raised during the conference relating e.g. to coastal management, quarry restoration management and earth heritage interpretation.

Posters
Poster presentations will form an integral part of the conference. Extended abstracts of posters will be considered for inclusion in the Conference Proceedings. **Abstracts of posters must be submitted by 24 September.**

Accommodation
The registration fee does not include accommodation. Participants will be responsible for arranging their own accommodation. A list of hotels, guest houses and B&B establishments in Edinburgh will be sent on request.

Travel to Edinburgh
Edinburgh has excellent air, rail and road links. A map showing the location of Dynamic Earth will be sent to all registered delegates at least 3 weeks prior to the conference. Limited parking may be available at Dynamic Earth.

Booking
A booking form is attached. Booking forms together with payments must be returned by **24 September 1999**.

Further information
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The Slovenian national territory is small, but of high diversity and interest from the geologic point of view. It

Preservation of Geologic Natural Heritage at Šentilj, Slovenia

extends in a region between the Eurasian and African lithospheric plates, respectively on the smaller Adriatic-Apulian plate, near the contact of geotectonic subunits of the Northern and Southern Alps, Dinarides and Pannonides. On the surface igneous, sedimentary and metamorphic rocks and exposed, of Paleozoic, Mesozoic and Cenozoic ages. They include many interesting geologic structures, geomorphologic peculiarities, beautiful minerals, and even much more various fossil remains. In the recent times much has been done for preserving the natural geologic heritage. Unfortunatelly, for several geologically interesting objects and many mineral and fossil localities this care came too late. Among the minerals only a few world rarities were discovered, but they are much more frequent among the fossil remains and other geologic objects of interest.

As in old times, also today most of collectors of minerals and fossils are not geologists, and collecting for them is hobby. Almost everywhere in Slovenia live a few of such inspired enthusiasts. They usually start by searching minerals and fossils in neighboring natural outcrops, on old mine dumps, in active or abandoned quarries, around any diggings for building purposes on the surface or below it. As a rule they are not satisfied by repeated

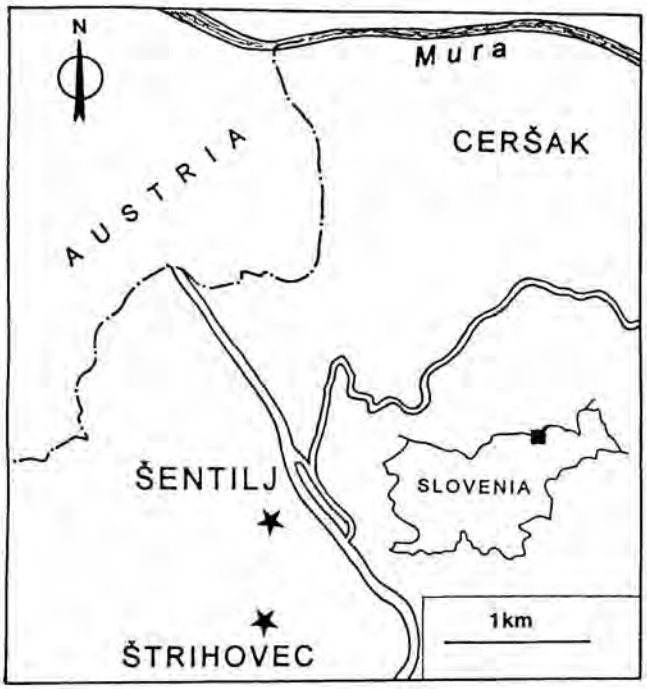

Figure 1. Location sketch map of a rare Miocene fossils and septarian concretions near Šentilj and Zgornji Štrihovec, NE Slovenia.

Figure 2. Calcitic internode of horny coral Keratoisis melitensis (Goldfuss) in the grey sandy marl from Middle Miocene beds near Šentilj. Natural size. Photo: M. Grm

searching of close-by localities, and they use to visit all well known localities across Slovenia. By relentless and systematic search they often come across entirely new localities of minerals and fossils which they like the most, and which they usually also hide from other collectors. Some of them hide their new finds from the professionals also, or they tell of them too late, which of course is not correct.

In recent times in Slovenia new modern highways and sliproads around towns are being built which is very favorable to geologists and collectors. A few years ago a shorter section of highway between Maribor and Šentilj was under construction (Fig. 1). Near the Slovenian-Austrian boundary, where a small hill built of Miocene beds was cut, thanks to the assiduous collectors from Styria an abundance of various macrofossil remains were found. Among them were numerous forms of sea urchins new to this area and remains of horny corals of species *Keratoisis melitensis* that was found in Slovenia first and at this locality only (Fig. 2). Certain species of Miocene sea urchins were up to now known only for the region of Mediterranean Tethys, among them also species *Clypeaster balillai* that was recorded for the first time in the region of Central Paratethys (Fig. 3). In the mentioned locality at Šentilj the most diverse Middle Miocene fauna in Slovenia was discovered. For this reason at that time the locality should have been protected and preserved as a part of geologic natural heritage. This was not possible because of fast progress of construction works, poor knowledge of geology by the participants, insufficient interest of Slovenian conservationists for geologic natural heritage, and because of faulty Slovenian legislature.

About a kilometer south, at Zgornji Štrihovec, numerous oval and spheric septarian concretions were discovered,

Figure 3. Irregular sea urchin Clypeaster balillai (Lovisato) from Middle Miocene sandstones near Šentilj; a. aboral side; b. oral side. Natural size. Photo: M. Grm

Figure 4. The smaller oval septarian concretion "in situ" in brownish marl near Zgornji Štrihovec. Photo: V. Mikuž

and attention to them was drawn again by the same group of Styrian enthusiasts. The concretions, the smaller ones and those two meter across, have a rich mineral paragenesis. In them nine macroscopically distinct crystal forms of minerals were established: ankerite, aragonite, up to 12 cm long barite crystals, up to 5 cm long calcite crystals, pyrite, sphalerite, orthoclase and the zeolites heulandite and ferrierite. According to size and the paragenesis these septarian concretions can be considered a global curiosity. Also they shoud be preserved *in situ*. At that time, however, in the field remained preserved more or less by chance a single septarian concretion (Fig. 4). Several poorer shaped concretions with relatively developed mineralization were transported to Ljubljana to the Geology Department of the University and to the Natural History Museum of Slovenia, while others were broken and inspected by the collectors, and the rest ended in landfill. Much faster than Slovenian conservationists were the Austrian geologists that visited the locality without any permits. They loaded several concretions on trailers and took them reportedly to Graz, Austria. In this case not only the authorities did not their duty, but also the custom officials that »overlooked« the bulky and very unusual load.

Since direct protection of the Šentilj locality was not possible, we proposed in 1996 to the construction and community professional services to assign in the frame of the highway installations near the discovered localities a smaller space for a geologic collection, a museum exhibition of the discovered geologic natural heritage from the mentioned localities. There the geologically memorable finds of this part of Slovenia territory could be shown to local and foreign visitors, and be at the same time preserved from destruction. Unfortunately, the promises were not kept. Our proposal that was in a way of recompensation nature, never was carried out.

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SLOVENIA

ProGEO Working Group No 3

The ProGEO Working Group No.3, North Europe met in Vilnius 7-10 May 1999. The meeting was hosted by the Geological Survey of Lithuania, and sponsored by EAGE - PACE Foundation. After a first part with sessions the meeting continued with an excursion for two days, during which Lithuanian Geosite candidates as well as other interesting geological sites along the road between Vilnius and Palanga were visited and discussed.

A compilation including the programme of the meeting, list of participants, abstracts of the key lectures and excursion guidebook was presented to the participants at the meeting by the hosts.

As a result of the visit to the Curonian Spit, a letter from ProGEO WG3 concerning a potential environmental threat, has been addressed to the Government and Parliament of the Republic of Lithuania. The area is a Lithuanian National Park and also proposed as a candidate to the World Heritage List. At the moment, there are strong local interests and plans for an increasing tourism to the area including the building of an airport as well as a bridge, instead of the present ferry between the mainland and the Spit. In the letter it is proposed for a controlled thematie eco-tourism and strongly advocated for a careful assessment of the future plans for the vulnerable and unique area.

Among visited sites was the Seskiné esker, an unique element of glacial accumulation relief in Vilnius city. This geomorphologic body also is selected for insert into the

The seskiné esker in Vilnius. Photo: Lars Erikstad

list of representative geosites in Lithuania. This geomorphological form was for the first time described as an esker in 1936, and somewhat later it was described in the Encyclopaedia of Great Britain "Britannica". The esker is a flexuous ridge (has three distinct turns) of embankment shape, stretching from SW to NE. It is 1160 metres long and up to 18 metres high. The esker is formed of obliquely bedded gravel and sand; a lot of boulders >0.5 m in diameter are in the gravel. On the of ridge (crest) a thin (1.2-0.7 m) cover formed of brown loam or sandy loam occurs by spots.

an other important site in the vicinity of Vilnius is the Puckoriai outcrop (approximately 63 m of height) of Quaternary (Pleistocene) rocks openend in the valley of the Vilnia River, a tributary of the Neris River. This outcrop is located in the Pavilnial Regional Park and is proclaimed as a geological monument. Here an imposing escarpment and sight of the Vilnia River winding attract visitors during all seasons of year.

The outcrop is a fragmental section where an interior structure of hill chain formed of push and press terminal moraines can be observed. Such the hills, evidently, were pushed by glacier of the Medininkai (Saalian) glaciation along its edge. This glacier left glacial loam with boulders, gravel, sand, silt, clay, etc. Owing to it, these rocks occur in great disorder, mosaicaly: in some places almost horizontally, elsewhere - obliquely, somewhere else - nearly vertically turned over or with distinct signs of glacial dislocations: folds, lumps, diapir folds (i.e. wedges), domes, blocks. Besides, in such a Quaternary rock mass the inserted blocks of Mesozoic rocks are found.

The excursion later consentrated around the coastal areas of Lithuania and especially the Curonian. The spit was impressing in its dimension and variety of landforms and biogeographical relations. Southwards from Nida at the bottom of high dune ridge descending into the Kursiu Marios Lagoon at the coves of Parnidis and Grobstas, are exposures of clayey gyttja. From XIX century German researchers used to call this rock "Haffmergel". After the analogy Lithuanian specialists named it "rnariu mergelis" - a lagoon marl. According to average data of analysis of composition this rock is like clayey gyttja: prevail organic matter in form of fine detritus (about 50%), pelitic (clayey) particles make up 30% (sometimes up to 60%) and carbonates - 15-20% or less.

Pollen and diatom analysis data of lagoon marl (clayey gyttja) from exposures in Nida show that these rocks exposed at the bottom of dune belong to the Atlantic and Subboreal chronozones and are deposited in the bay of the Litorina Sea. The exposures of clayey gyttja (lagoon marl) seem to be caused by a colossal mass of the dune ridge. The ridge of aeolic sand is slowly moving eastwards

Part of the excursion group in discussion on the puckoriai outcrop. Photo: Lars Erikstad

Eolian landforms and processes on the Curomian spit. Photo: Lars Erikstad

and pressing the coast of the Kurgi4 Marios Lagoon. This cause the deformation of the clayey gyttja beds occurring under the sand and their exposure at the surface.

For more information and references is referred to the excursion guide:

***Satkunas, J.** (ed). 1999. Meeting of the ProGEO Working group No 3. North-west Europe - Vilnius - Palanga 6-10 may 1999. Published byGeological Survey of Lithuania.*

This summer a really pearl of an illustrated book about geoconservation ar-

The clayey gyttja (Parnidis lagoon marl) being squeezed up by the weight of the eolian sand dunes. Photo: Lars Erikstad

Geological monuments of Italy

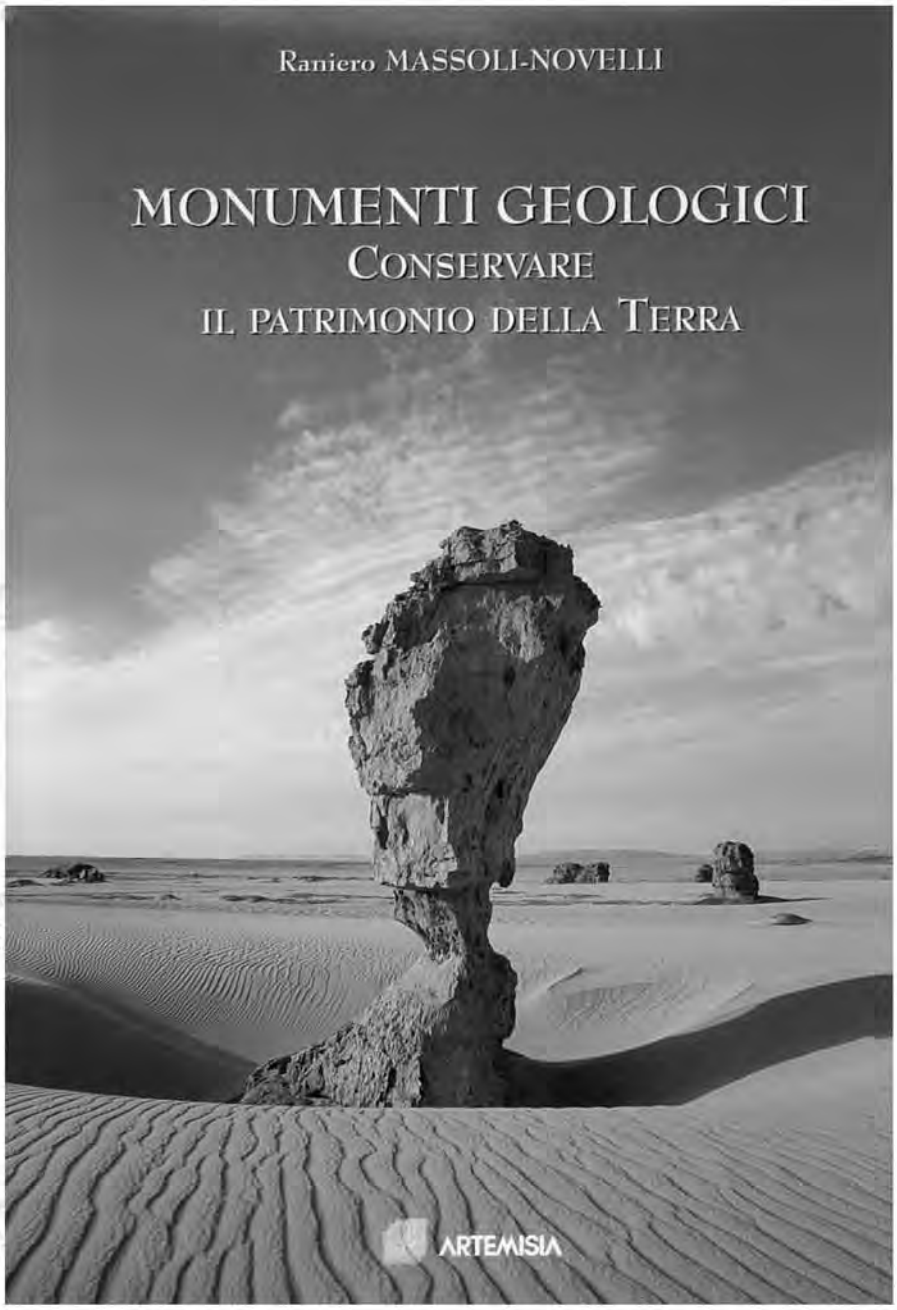
rived the editor. The book is full of illustrations showing geotops from Italia and from elsewhere in Europe.

The only problem is that the text is in Italian which limits the use of the book for us who do not understand that lovely language, but the amount of pictures makes it highly useful.

The book is made by our ProGEO friend Raniero Massoli-Novelli and is a photo-documentation of geological sites.

Looking through the book I remembered a meeting in ProGEo (a long time ago) discussing to make such a book for Erope promoting geoconservation and ProGEO. Well, here we have tha basis of such a book. If translated into other languages and perhaps with some adjustments of the selections of pictures it would indeed be what we asked for.

The editor



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