ProGEO NEWS

No.2 1999

Sella massif, famous geosite in the centre of Dolomites: the base of the rounded massif is a carbonate, well bedded series of Ladinian age; in that time the area was a giant reef similar to today Bahamas. On the top some outcrops of "Dolomia Principale", Norian age.

Dolomites: a future "Geopark"?

The fascinating geological landscape of the Dolomites has attracted the attention of many generations of geologists and the eyes of millions of visitors for almost two centuries. Many of the early geological studies had a profound impact on the understanding of growth of carbonate platforms, on facies change interpretations, on concepts of Permo-Trias magmatism, on detailing the erosional features of carbonate rocks.

The Dolomites contain a big number of different geotopes, from Paleozoic to recent times: over an area of about 100 x 70 km, east of the highway Trento-Bolzano and to the Belluno province (Dolomites of Cortina d'Ampezzo-Dobbiaco), probably there are geological and social elements here to create a future "Geopark".

Now we describe five of the more popular geotopes, going from east to west.

The **"Tre Cime di Lavaredo"** , few kilometers NE from Cortina, are three huge towers of Upper Triassic dolomitic rock with a top elevation of 3.000 m. The Dolomites are full of spectacular erosional features, needles, towers, pinnacles but the Tre Cime di Lavaredo, high about 600 m over a platform of easily eroded varicoloured claystones (Raibl formation), are really majestic. The perfectly marked horizontal stratification of the Upper Triassic rock (Dolomia Principale) is the result of cyclic deposition in alternating environments, marine and subaerial, on a vast carbonate shelf. Many fossils, among them the famous Megalodon, a big lamellibranch, are in the marine strata. The walking tour of the geotope begins from the "Rifugio Auronzo", at 2.300 m, where it is easy to arrive by car. In Cortina d'Ampezzo there is a small but nice paleontological-geological museum.

The **Sella** massif, in the centre of the Dolomites area, is one of the most famous mountain of the Eastern Alps: it is a rounded carbonate massif with peripheral vertical precipices; it seems a giant medieval square castle. Its flat top reaches 3.152 m at Piz Boè; at the four cardinal points there are 4 important Dolomites passes: Pordoi Pass to the south, Campolongo Pass to the east, Gardena Pass to the north and Sella Pass to the west.

The Raibl claystone formation horizontally cuts the Sella massif in two parts: the upper one is constituted by the well bedded "Dolomia Principale" (the same of the Tre Cime di Lavaredo). The lower part is a carbonate platform, about 8 km across, with a mean thickness of 500 m, of Ladinian age. There are typical features of the "progradational" genesis of the Sella reef, i.e. giant strata of basal "megabreccia" which outcrop near the Pordoi Pass.

From the same pass it is advisable to arrive with a cableway at "Sass Pordoi" (2.950 m), where the best geological landscape view over all the Dolomites peaks is, especially the Marmolada glacier just in front of you.

Torri del Vajolet (Vajolet Stacks). Among the many stacks in the western Dolomites, the thin "Torri del Vajolet" are the highest and the best-known. The site is in the N-S range of Catinaccio, at an elevation of about 3.000 m between the Val di Tires and the Val di Fassa. Many visitors (too many in summer) arrive from the latter valley, reaching easily the Rifugio Gardenaccia from Pozza di Fassa (only with "Comune" minibus) and then the Rifugio Vajolet. Less mountaineers arrive from the other, quieter valley (Val di Tires); the path begins near Passo Nigra and it needs about 3-4 hours to arrive at the site.

The stacks are three, are high about 400 m and the rock is a Ladinian dolomite; they are very thin (a geotope at risk) and this is its fascination; somebody called the Torri del Vajolet "a poem in the sky".

"Piramidi di Terra" (Earth Pillars) of Segonzano (Trento). Earth pillars are formed by the denudation carried out by rainfall and surface water over moraines, in which large boulders are embedded. The

Tre Cime (Three Towers) di Lavaredo: one of the most popular geosite in the Dolomites. The highest of the towers reaches an altitude of 3.000 m and is high about 600 m. The rock is Upper Triassic dolomite in perfectly marked horizontal strata.

latter tend to protect the loose material below, while the surrounding moraine is gradually eroded away.

Moraines are very distributed around the Alps; it is not clear why Earth pillars form only in very few sites. Probably it depends from the synergy of different factors: right proportion in clay and boulders, right valley steepness, absence of wind, etc.

The more spectacular groups of "Piramidi di Terra" in the Dolomites are near Segonzano, NE from Trento; other important groups are in the Renon area, west of Bolzano at the west border of the Dolomites. In both geotopes the boulders are of Permian volcanic rock ("porfido quarzifero"), a very hard, reddish ignimbrite which constitutes the very large basement (2.000 sq. km.) of the western Dolomites.

In Segonzano, near the site, there is a small geological park, with a guide, specially-made paths, maps, explanatory booklets (it is also possible to taste a marvellous "polenta e salsicce" with the famous local wine).

Dinosaur footprints at Lavini di Marco, few km east of Rovereto. We are at the SW border of the Dolomites. These are the finest of the very rare tracks discovered until now in the entire Alps. There are more than one hundred footprints which belong to two Dinosaur species; one is a biped of the Ornitischia order, about 5-6 m high. They lived here about 200 million years ago. The strata with the tracks belong to the "Calcari Grigi" formation, Lower Trias age. The surface was exposed by the detachment of a mass rock; the biggest Marco landslide (locally landslide=Lavini) occurred about 1.300 years ago and is mentioned in Dante Alighieri's "Divina Commedia" (Inferno, canto 12).

In the site there are signals and a path but no guides; in Rovereto there is a small Natural Science museum o contact.

Raniero Massoli-Novelli & Marco Petitta

ProGEO On the net

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

Pro GEO 2000

The annual meeting of Pro GEO in the year 2000 will be arranged in the Czech Republic 1st - 10 th of June 2000. The first circular with a preliminary program and an initial registration form are sent out. The program will take two forms:

a) Three days of talks, including a formal business meeting of ProGEO
b) Five days of excursions to the Lower Paleozoic, Upper Creataceous and Cenozoic of the Bohemian Masif.

Priority will be given to the national representatives and regional chairmen of the ProGEO. If it will be possible to accommodate additional participants then it will be strictly on a first come, first served basis.

Contact

Dr. Jiri Kriz PhD, Czech Geological Survey, P.O.B. 85, Praha 011, 118 21, Czech Republic

GeoTRIP 99

for more information if you have not received the first circular.
This year it is GeoTRIP year again. The national excursion activities are planned for the week 38 including the weekends. Excursions, lectures, etc. can help to bring earth sciences and geoconservation closer to the general public and the policy makers. It helps to increase the support for an official geoconservation policy, nationally as well as internationally.

Reports of the activities can be send afterwards to:

Gerard P. Gonggrijp , Odinksveld 1, NL-7491 HD DELDEN, The Netherlands. Tel/fax: ++31 74 3761234

(E-mail address is not available at the moment. It will be published in the next Newsletter).

From the President

Dear ProGEO Friends,
I am pleased to contact you again. I hope that all of you and your families are well and doing well. I do not doubt that you never forget ProGEO and all of us work as best as we can for its prosperity!

I will concentrate on three main tasks for ProGEO in 1999.

First is the III International Symposium (ProGEO) on the Conservation of the Geological Heritage, which will be held in Madrid, Spain on 23-25 November 1999. As you are already well informed by the Organisers and ProGEO Executive Secretary, the things around Symposium are going very well, and I do not doubt we will have our next very successful Symposium this autumn. Going back to the past, I remember with great satisfaction the first and second Symposiums of ProGEO in Digne (France) and Rome (Italy) respectively. Essential results from them directed the future development of ProGEO as an association. I hope very much that the III Symposium in Spain will be the next important step to our progress. We will get the oppertunity of further discussions on the scientific basis, inventory and cataloguing, educational and interpretative, planning and management, legal and administrative, and similar important tasks for geological heritage conservation, as well as to discuss recent and future ProGEO development. I really hope you will attend the Symposium and will make your contribution to secure its success.

The second main ProGEO task for 1999 is the planning of the next Regular ProGEO Meeting. As you are already informed our association will bring together its members every second year. After providing contacts and discussions in 1998 between ProGEO Executive Committee and the Czech Geological Survey, I am pleased to inform you that the ProGEO'2000 Meeting will be held in the Czech republic. It will be organised by the members of the National Group for ProGEO. The ProGEO'2000 Meeting is very important not only because we are going into the 3rd Millennium and have to plan our future activities according to its requests, but also as an election meeting. Our Czech Friends are eager to show us both the geological heritage of their country as well as samples of its culture, wine, beer, etc. I have many times visited the Czech republic and know very well their organisation talents and possibilities and do not doubt that it all will be organised, as usually, perfectly. I hope to meet you in Prague next year, dear Friends.

The third main task is to play more active role in the final preparation and future realisation of the new Geoparks UNESCO Programme. As ProGEO President, I have already attended one of the UNESCO Meetings in Paris this February and Bill has attended one of the earliest Meetings. After the Bulgarian ProGEO'98 Meeting some of ProGEO members played a very important role in preparing this very good UNESCO idea, and I hope to see it ready and accepted by the UNESCO Headquarters soon. The Programme looks very promising. ProGEO will be one of the most important organisations with respect to practical development of the Programme and I see many opportunities for ProGEO activity here.

1999 is a also a year of many regional and national meetings. First in the Meeting of the ProGEO WG 2 of Nordic countries in Vilnius in the beginning of May are coming up. A week later the Bulgarians ProGEO Workshop in Varna at the Black sea cost is sheduled. Then the ProGEO WG 1 of SE European countries plans to have a meeting in October in Greece. Our Kazakh Friends do also plan a national meeting. Furthermore I see good opportunities to present the results and at the same time to popularise ProGEO and its activity during external meetings such as the International Earth Sciences Colloquium on the Aegean Region between 25-29 Sept. 2000 (IESCA-2000) in Izmir, Turkey, and indeed also during the 31st International Geological Congress in Brazil in August 2000.

I would like to inform you that the Proceeding volume of the ProGEO'98 Meeting in Bulgaria is already in the Publishing House for printing and I hope to distributed it to the participants soon.

I do not doubt that we will find many other good news in this ProGEO NEWSr Issue. I would, however, like to ask again all ProGEO members to send short informations about their activity to the Editor more often. He needs that,

The Dolžan Gorge

The Dolžan gorge in the valley of the Tržiška Bistrica river north of the town of Tržič, Slovenia, cuts deep in the Karavanke Mountains. From the geologic point of view, this is one of the most interesting and most well known parts of Slovenia not only owing to the scenic geomorphology (gorge, rock-pyramids), but also owing to the profile cut through Carboniferous, Permian and Triassic beds, and especially owing to numerous fossils. In the northern part occur Upper Carboniferous shales and quartz sandstones with intercalations of black limestones. In limestones occur numerous fusulinids, among others *Rugofusulina alpina, Quasifusulina longissima* and alga *Anthracoporella spectabilis*. In the Upper Carboniferous beds also bioturbations and carbonized plant remains can be found.

The initial part of the Dolžan Gorge.

In recent times to Upper Carboniferous also the quartz conglomerates are attributed. They consist chiefly of white quartz. In the riverbed large boulders of this rock lie, and water forms rapids over them. Above the conglomerates follow dark limestones and shales. In the middle part of the gorge occurs the grey to reddish Dolžanova gorge limestone. In the abandoned quarry in former times numerous fossils were collected. The fossil hunters did a good job, so not much can be found here nowadays. In limestones are remains of fusulinids, brachiopods, crinoids, bivalves, snails, cephalopods and very rare trilobites. Here more than 80 brachiopod species were found, among them 21 new ones also *Karavankina schellwieni* and others.

In the narrow part of the gorge outcrop black bedded limestones that interbed with shale. In these limestones *Sphaeroschwagerina carniolica* was first described, and named after Carniola, a part of Slovenia. In certain areas of these beds occur corals. They are especially abundant in the second rock pyramid above the gorge. There among other species also *Carinthiaphyllum kahleri* was found. Black limestone is exposed also in that part of the gorge where the road passes through a tunnel.

The Tarvis breccia named after the town of Tarvisio in Italy alternates with red sandstone. The breccia contains abundant fragments of the Trogkofel limestone. In the part of gorge more to the south crop out the Middle Permian beds of Gröden formation that consist of sandstones, conglomerates and claystones. Follow the Lower Triassic brown, violet and grey marls, limestones and oolitic limestones. In them occur the bivalve *Anodontophora fassaensis* and the snail *Holopella gracilior*. Above lie Anisian dolomites and beds of the Ladinian stage.

The Dolžan gorge was proclaimed natural monument by a decree of the Tržič Commune. It has been known for long. The Austrian geologist

Rock pyramids with Lower Permian corals.

F. Teller was the first to collect the fossils aided by the local people. Brachiopods and other fossils were studied by E. Schellwien. The first publication appeared in 1898, and the most important one in 1900. Owing to very detailed descriptions of brachiopods, this work became a basis for later studies of the Lower Permian brachiopods in the Southern Alps. F. Heritsch in 1933 described the corals and revised the brachiopods, and found the first trilobite *Phillipsia oehlerti.* Fusulinids were studied by F. and G. Kahler (1937). The Dolžan gorge used to be so famous in the geologic sense that in 1903 one of the field trips for the World Geological Congress in Vienna was lead here by F. Teller. The Dolžan gorge was for the second time visited by a field trip of the Geological World Congress in 1971 when it was held in Krefeld, Germany.

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Rajko Pavlovec

Urgonian Profiles

Conservation of Urgonian Profiles - a Part of Eastern Serbia's Geoheritage (Yugoslav Carpatho-Balkanides)

The term Urgonian (Urgonian formation) implies a specific biosedimentary system - carbonate rocks of the Upper Barremian - Lower Aptian with specific biological elements. Urgonian carbonate rocks constitute the former vast unstable shelf of Tethyan geosincline, known in literature as Urgonian Carbonate Platform. Urgonian sediments in eastern Serbia have a wide geographic distribution. They form the mountain massifs of Homolje, Kucaj, Rtanj, Tupiznica, Ozren, Devica, Svrljiske Planine, Suva Planina, and Stara Planina. Considering their occurrence with regard to other Mesozoic formations of eastern Serbia, Urgonian sediments have not been sufficiently systematically investigated.

Urgonian geosites of the central part of eastern Serbia have been examined during a long-term research in the project Paleoecological Studies of Lower Cretaceous *Echinoidea* of Eastern Serbia. After the list of candidate sites meriting conservation had been narrowed down, the site Faca Vajali/ neighbourhood of Boljevac was chosen as the most instructive. The site was selected on the basis of the following characteristics:

- The site contains all sedimentological and biological elements typical of Urgonian formation on a comparatively small area: *e.g.* lateral and vertical succession of various sediments is readily observed, characteristic representatives of fossil macro- and micro-associations have been recorded.
- The site is representative, with an immediate visual impact, accessible and available for the prosecution of geological science;
- In view of the difficulties in defining the Barremian - Aptian boundary, this area affords opportunities for further geological investigations and re-examination of the existing theories.

Site description. The site Faca Vajali comprises 3 profiles: Faca Vajali/ the Mouth of the Arnauta, Faca Vajali/Panorama, and Faca Vajali/the Spring, named after geographic markers.

- The profile Faca Vajali/ the Mouth of the Arnauta (GPS co-ordinates 4858,900-7576,25) is composed of 12 sediment packets, bioclastic W/P, G, and W. The profile is a huge lumachella containing pachyodont shells solely. The dominating genera are *Toucasia*, *Matheronia*, *Requienia*. The micro-association comprises algae, different foraminifer species, and mollusc detritus.
- The profile Faca Vajali/Panorama (GPS co-ordinates 4859,900-7575,100) contains massive bioclastic W. The macrofauna consists of shells, gastropods, brachiopods, and echinoids. The micro-associations is comprised of algae and orbitolines.
- The profile Faca Vajali/the Spring (GPS co-ordinates 4859,050-7574,275) encompasses nine sediment packets over 100 m thick. Bioclastic W, W/P, G, and P succeed one another laterally and vertically. Micro- and macro- associations of fauna and flora are remarkably rich and well preserved, which is not usually the case with Urgonian fauna. So far, 15 echinoid species, 10 bivalve species, 8 gastropod species, 4 coral species, etc. have been determined from this profile.

The selected profiles comprising the geosite Faca Vajali are part of the inventory of the Working Group for the Cretaceous at the National Council for the Conservation of Yugoslavia's Geoheritage. The profiles are likewise the first candidates for the conservation of Mesozoic geosites on the territory of eastern Serbia. In the conserved geomorphological site complex in the immediate vicinity (Bogovinska Pecina cave, the Canyon of the Zlotska Reka R) it is only with the selected profiles that there begins the conservation of the basic values - rocks wherein the morphological structures had been cradled.

Aleksandra Maran

This contribution was received this winter and contained originally 4 figures. Because of a corrupt datafile hese figures have been lost. Communications with Serbia from Norway are at the moment impossible. This is the reason why the article appears without figures.

At the same time I feel the need to express the deep concern and a hope for peace on Balkan and a believe that we are able to create a future for Europe with continuos and friendly co-operation between all peoples of the continent.

The editor

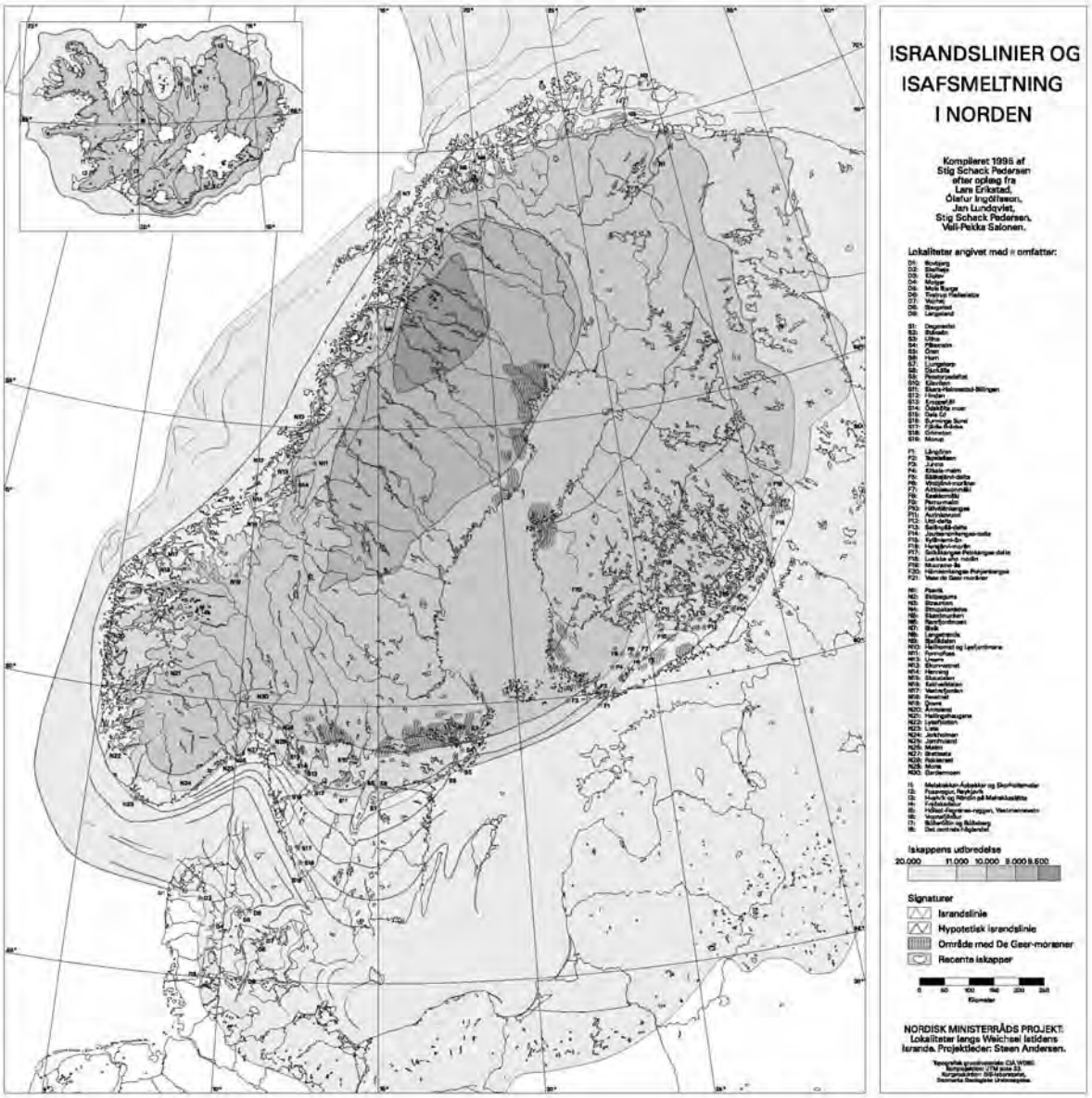
Weichselian ice-limit project

The project "Weichselian ice-limits of the Nordic countries" has now resulted in a published report. The project has been carried out for the Nordic Council of Ministers during the years 1993-1996.

The geological theme of the project is the melting of the ice cap in the Nordic countries at the end of the last ice age (glacial phase) and, in particular, deposits from the ice margin that demonstrate the shifting position of the ice front through time..

The specific aim of the project has been to select and describe the geological aspects for an assembly of sites that, when viewed together, will provide the opportunity to follow the shifting position of the ice margin in the Nordic landscape.

The selected sites have previously been the subject of research, both in the individual countries and across national borders, and the results of that research



form the basis for the site selection. In the present project the focus has been widened to include administrative aspects for the individual areas, such as the educational value of the sites, and potential threats such as gravel extraction etc. This expansion of the site descriptions reflects an important perspective of the project. Its results are primarily intended to demonstrate to the public, as well as administrative authorities, the obvious geological value of the sites in question and consequently that they should be given protected status.

The melting of the ice cap at the end of last ice age has been chosen as the topic for a co-Nordic project because of its extension through all Nordic countries. Region by region the ice retreated northwards in a concentric pattern that showed no respect for present-day borders. Only by regarding the Nordic countries as an entity, it is possible to make a representative selection of sites.

A considerable part of the project has been the exchange of experiences regarding geological environmental management in the Nordic countries, each with its different traditions and experiences.

Nordic Council of Ministers initiated and financed the project which took place from 1993 to 1996. The participating geologists from each country had different geological and administrative fields of expertise. The participants were: Denmark, Finland, Iceland, Norway and Sweden, represented by Steen Andersen (chairman); Stig Schack Petersen (secretary), Veli-Pekka Salonen, Olavi Selonen, Olafur Ingolfsson, Lars Erikstad, Jan Lundquist and Lennart Vilborg

The project group devised common guidelines for the selection of the sites, for the description of sites and for the content of the final report. Then the geologists in each country made the actual selections and descriptions and finally, the resulting material was edited into a report by the chairman and the secretary.

The projects has also resulted in a set of recommendations:

- The selected sites should be protected and managed.
- Legislation and administrative principles in each country should be examined with the specific aim of enhancing the geological aspect in environmental management especially concerning mineral extraction.
- The present project should be followed by a selection of sites on a regional basis.
- The project should be extended to neighbouring countries that were also covered by the Weichselian ice cap and show related and correlatible ice margin features. The extension of the project should be effected in cooperation with ProGEO, an European association for the projection of geological sites.
- The results of this project should be published as a school book.
- Nordic Council of Ministers should encourage similar projects with different geological themes.

As a supplement to the report a map (see figure) has been drawn, showing the position of the most significant halt stages and marginal deposits of the Weichselian (last glacial) ice sheet. The map also shows the location of the described sites. The large-scale map may also be used as a poster.

Steen Andersen

ProGEO

Geological Heritage Meeting France

Société Géologique du Nord, Musée d`Histoire Naturelle de Lille and Conservatoire des Sites Naturels du Nord et du Pas-de-Calais arranges a two day French National meeting on the geological Heritage in Lille 16- 18 June 1999.

The meeting consists of a public meeting, a conference and a excursion. The theme of the public meeting will be: The geological heritage: a new stake of development, given by Prof. Maurice Mattauer. The conference is split in 4 themes:

- The geological heritage, the stake of development of scientific knowledge
- The geological heritage, the stake of development, culturally and educationally
- The geological heritage, exploitation of resources and safeguarding of the heritage
- The geological heritage, the stake of development stake of develop tourist

More information can be obtained from:
Société Géologique du Nord - Université des Sciences et technologies de Lille - Bâtiment SN 59655 Villeneuve d`Ascq. France.

PROGEO WORK-SHOP
CANCELLED

Varna, Bulgaria, 16-23 May 1999

Following the plan for future activities of the European Association for the Conservation of the Geological Heritage (ProGEO) and in accordance with the new UNESCO Geoparks Programme the National Working Group together with ProGEO Working Group No 1 and ProGEO as a whole has already begun preparation of a ProGEO Workshop, which will be held between 16-23 May 1999 in Varna - Bulgaria.

The main aim of this Workshop is to bring together the geological heritage conservation experts to discuss genetic, socio-economic, scientific, educational etc. problems of the World famous Pobitite Kamany (Dikilitash) rock forest near Varna, as well as of the St. Konstantin and Zlatni Pyasatsi sand dunes, Kaliakra cliff and caves, Chudnite skali, the Upper Cretaceous-Tertiary geological border (iridium anomaly) at Byala and other beautiful geosites in Varna region as a part of one of the first possible UNESCO Geoparks. Some of the most interesting historical and archaeological places and museums in the region will be visited. The participants will have the chance to cross by bus the whole Northern and Southern Bulgaria, and to experience its geology and landscape. During the Workshop a ProGEO an Executive Committee Meeting will be held as well.

The Workshop participants will be met on 16 May 1999 (Sunday) in Sofia and will be transported back to Sofia on 22 May 1999 (Saturday) evening. The full accommodation fee and transport expenses together with the first and last night in Sofia (hotel and dinner) are included in the total cost of 500 US. It will be no registration fee to attend the Workshop, but there are not special funds to support individual participants. All payments will be made in Sofia.

It is a great pleasure for me to invite you on behalf of The Organisers to attend the Workshop. I hope you will manifest your interest as soon as possible. The formal deadline has expired, but if you are interested contact:

Prof. Todor Todorov by e-mail (<uptech@ttm.bg> or fax (+359-2-75.91.04).

Just before printing the following mail from Todor arrived:

I am very sorry to inform you that the ProGEO Workshop on 16-23 May 1999 in Varna - Bulgaria was cancelled. I hope for a short time only! I cannot explain anything. You will understand us.

Sorry again. Yours always, Todor

In the end of 1998 the illustrated guide-book "Geological Natural Monuments of Russia" was published. It was prepared by The Central Scientific-Researching Geological-Prospecting museum named after the academician F.N.Chernyshev (St. Petersburg) and edited by the Ministry of Natural Resourses of the Russian Federation. This is the first attempt to give a brief summary on the rare and unique geosites of Russia. Its main aim is to attract public attention to the geological objects of a high scientific, educational, historical, aesthetic or recreational value which are to be preserved for the future generations.

The book contains the descriptions of 484 geosites all over the territory of Russia. The geosites are divided into 8 main types: stratigraphical, paleontological, mineralogical, petrological, tectonical, geomorphological, hydrology-hydrogeological and historical ones. The descriptions are disposed according to the administrative subdivision of Russia.

The english version of this volume will be prepared for the Geological Congress in Brazil.

The sandurs of southeastern Iceland, highly active geotopes and part of our geological heritage.
Photo: Lars Erikstad

Various meetings

III International Symposium Pro GEO on the Conservation of the Geological Heritage, Madrid, Spain, November 23-25, 1999.

Internet: http://www.tilesa.es

Earth Science and the Natural Heritage: interactions and integrated management. 4-5 November 1999. Dynamic Earth Edinburgh, Scotland.

Contact: JOHN.GORDON@snh.gov.uk

ProGEO – Working Group 3 for Northern Europe meets in Vilnius, Lithuenia Vilnius, May 6-10, 1999.

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Deadline for contributions to next issue of ProGEO NEWS: 01.08.99

ProGEO: European Association for the Conservation of the Geological Heritage. **Bank-account:** Deutsche Bank Hamburg - bank code number: 200 700 00, account number: 63 14 918. **Membership subscription:** personal: 50 DM/yr., institutional: 300DM/yr. **President:** Dr. T. Todorov, Geological Institute og Bulgarian Academy of Sciences, George Borchov St. 24, Sofia 1113, Bulgaria. **Executive Secretary:** W.A.P. Wimbledon, Postgraduate Research Institute for Sedimentology University of Reading, Whiteknights, READING RG6 6AB, United Kingdom.
ProGEO NEWS - A ProGEO newsletter issued 4 times a year with information about ProGEO and its activities. **Editor:** Lars Erikstad, NINA, Box 736 Sentrum, N-0105 Oslo, Norway, Phone: + 47 23 35 51 08, Fax: +47 23 35 51 01, e-mail: lars.erikstad@ninaosl.ninaniku.no. Contributions prefered on diskette (Word- or ASCII-format) or by e-mail if possible.

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