



No.4

2000



*The highest situated shingle field is at 260 m above sealevel.*



## The World Heritage List

### THE HIGH COAST OF SWEDEN

At the meeting in Cairns November 2000, the World Heritage Committee decided to include the High Coast on the World Heritage List. At present, the High Coast is the only World Natural Heritage in northern Europe and it is a Geological World Heritage. Lapponia in Sweden is a mixed property (natural and cultural).

The High Coast is the finest site for the study and understanding of the important processes that formed the glaciated and land uplift areas of the Earth's surface. The long-standing scientific studies of the High Coast mean that it is an area of global significance with respect to the

intrepretation of the geological as well as biological and culture-historical effects of the great inland ice sheets and land uplift. The area with its well-documented and dated geology, its record of shoreline displacement, 285 m, over the course of 9,600 years, and the distance between the highest and the present shore, 2–3 km, is outstanding. There is no other area of glacio-isostatic rebound comparable to the High Coast to be found anywhere in the world.

The Swedish Government decided in June 1998 to nominate the High Coast along the Bothnian Sea for inclusion on the World Heritage List. The Swedish Environmental Protection Agency, the Västernorrland County Administrative Board, and the Geological Survey of Sweden have jointly elaborated the application.

The magnificent bedrock landscape has been formed during millions of years of weathering, glaciations and littoral processes. The morphology in many places clearly



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*Till-capped hill with a forested top above the wave-washed zone marking the highest shoreline.*



*Raised beaches on a large shingle field down to the coast. The bedrock consists of a red granite.*



*An inlet and an isolated lake in the background.*

reflects the underlying lithologies. The area has attracted great attention in connection with geological congresses and symposia, and during national as well as international excursions. The High coast is a key area for the understanding of glacio-isostasy.

The High Coast is an almost 100 km long coastal area of the Bothnian Sea between the bay of the river Angermanälven in the south and the city of Örnsköldsvik in the north. The High Coast is the only hilly area around the Baltic Sea. The rolling highland terrain of the northern Swedish inland here reaches all the way to the shoreline. The area displays considerable differences in elevation and depth, with peaks up to 350 metres and the seabed in the archipelago as deep as 120 metres. The main character of the High Coast is a scenic bedrock coast of hilly peninsulas, islands, narrow valleys and inlets, deep bays and straits as well as ongoing processes due to the land uplift such as isolated lakes in the inlets.

The high topographic relief and the well-exposed wave-washed shores offer good opportunities for studies of the rocks and their structures. The area has long had great scientific value with its rich variety of well-exposed examples of e.g. various intrusive rocks, their contact

zones, metamorphism, sheeting, igneous layering and lamination plus faulting.

The area was deglaciated about 9,600 years ago according to the Swedish geo-chronological time scale. The ice margin receded westwards (to the interior). The ice-free parts of the High Coast area were exposed to the waves of the Yoldia Sea, an early stage of the Baltic. The highest shoreline is marked by till-capped hills with a forested top above the wave-washed zone. Below this, wave-washed sediments – shingle, gravel and sand – form a more or less continuous cover on many slopes and are often concentrated in pronounced beach ridges. These deposits may be exceptionally thick, up to 20 m. Large shingle fields occur in the massif of the easily weathered rapakivi granite.

By an extraordinary piece of field work, Gerard De Geer (1858–1943) completed a map of the "Uppermost marine limit" in 1888 and 1890. On the map, the isobases for 60, 120 and 180 m showed a concentric pattern with an elliptical central area between Oslofjorden and the northern part of the Bothnian Sea. The isostatic effect, after the deglaciation, was thus elucidated and a longstanding controversial question was settled. Later



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A 200 m long, 40 m deep and 7 m wide cleft in the Rapakivi granite.



The wild dolerite coast of one of the islands



studies show that the centre of the land uplift is situated in the High Coast area and that the highest shoreline reaches the highest position in Scandinavia as well as in the world, 285 m above sea level. From there it falls in all directions. The total uplift, ca. 800 m, reaches its maximum in approximately same region as the highest shoreline actually reaches its maximum level.

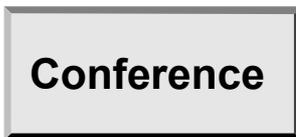
The highest shoreline in Norway is 220 m above sea level in the Oslo area. The present rate of land uplift in the High Coast area is ca. 8 mm per annum.

The High Coast has the greatest glacio-isostatic land uplift in the world. A comparison with all land uplift areas in the world after the latest glaciation shows that the only comparable area is at the south-eastern part of the Hudson Bay area in Canada where the equivalent uplift is 272 metres. The other areas with glacio-isostatic land uplift reach substantially lower levels. Furthermore, within many of these areas the glacio-isostatic land uplift can be difficult to distinguish from tectonic uplift.

Due to the undulating terrain the distance between the highest shoreline in the High Coast area and its present shoreline is only approximately 2 km whereas at Hudson Bay the distance is roughly 50 km. The land uplift's geological and biological impact is therefore exceptionally evident and concentrated in the High Coast.

The High Coast is widely described as beautiful countryside, a landscape with steep hills and breathtaking views, a landscape that constantly catches the attention of visitors with "high hills and deep valleys, hidden inlets and serene lakes".

*Curt Fredén.*



## ProGEO

### Russia Open Conference

**Krasnoyarsk, September 8-14, 2000.**

Field excursions to Natural Reserve Stolby, Cave Oreshnaya, Carboniferous plant and Jurassic plant and insect localities around Krasnoyarsk are planned.

Contact person: A.V. Lapo (vsegei@mail.wplus.net)



## The World Heritage List

The Kursiu Nerija - Curonian Spit National Park was officially included into the World Heritage list. This decision was taken by the UNESCO Heritage Committee meeting held November 30 2000 in Australia. It was stressed that the Curonian Spit, as cultural landscape is reflection of the sustainable interaction between humans and nature.

ProGEO WG No 3 has contributed actively in May 1999 protesting against development of the airport threatening to coastal habitats, dune system and water intake in Nida. Lets hope, there will be no big airports and ecotourism will be prevailing action of the visitors.

Everybody who want know more about the Kursiu Nerija can take a look in ProGEO WG website - the excursion description.

*Jonas Satkunas*



## Geological, historical and biological sites in Lep-pävaara, Espoo

In the last ProGeo Annual Meeting held in Prague, a paper on geological, biological and historical sites of Lep-pävaara (Espoo) Finland was published in the Abstract Volume edited by Dr. Budil. As I was unable to present my work personally in that meeting, I wish to tell you that a popular article was published in the Finnish environmental review Suomen Luonto (Finnish Nature) during the summer, both in paper and electronic version and there are some figures on it. Unfortunately the article is in Finnish, but electronic version has a short summary also in English. The internet version is found at the address:

Eerola, T. & Rahkonen, J. 2000 Rocks reveals the past (in Finnish). Suomen Luonto, 59 (7)  
(<http://www.suomenluontolehti.fi/lehti.php3?id=14>).

The English summary:

<http://www.suomenluontolehti.fi/artikkeli.php3?a=31>

*TONI EEROLA*



## From the President

Step by step the year 2000 becomes past. I do not doubt you will all agree with me that this was an exceptional year. Firstly, the year 2000 is the last year of the 20<sup>th</sup> Century and the Second Millennium. This happens ones in a thousand years! We are all happy to celebrate this year, to live and work in it and to enjoy it. What a remarkable combination, isn't it?

Secondly, the year 2000 is successful for ProGEO. ProGEO not only grows one year older but also gives evidence that it will soon become the most important European Association dealing with the problems of conservation of the geological heritage of Mother Earth. ProGEO has already established its position amongst the numerous associations, organisations, foundations, etc. in Europe, and, I suppose that after its official registration in the end of this year it will develop further and will play significant role in all aspects of the conservation of geological heritage in Europe. And why not in the whole world? I will be sincere to say that this is an old dream of mine and I will be happy to see it realised.

In June 2000 we had our Biennial ProGEO Meeting in Prague, Czech Republic. It was the last ProGEO meeting, which was very successful as usual. It included the election of a new Executive Committee for the next two years, a scientific session with really new and very interesting results and excellent geological excursions to some of the most significant geosites in the country. New ProGEO Friends from the CIS countries attended the meeting as well. They were pleasantly surprised at our important work and promised to involve themselves seriously in our activity. The Czech Friends in the face of the Ministry of the Environment Dr. Kuzvart, of the Director of the Geological Survey Dr. Ruzicka and Dr. Kriz made their best to help and I think the last ProGEO meeting will leave a trace in the history of the Association. ProGEO has already said its "Thank you very much" to all Czech Friends, but I will take this opportunity to thank them again.

The second important detail in ProGEO activity during the year 2000 is not less important than the above. Following the resolutions of ProGEO'2000 Council and of the meetings of the Executive Committee our Swedish Friends Lars K. and Gunnel R. registered ProGEO in Sweden as a non-governmental organisation (November 2000). The registration has put an end to ProGEO's semi-legal existence and, as I have already mentioned, the Association has a real chance to become the most important organisation dealing with the geological heritage conservation of Mother Earth.

The third important detail is the increasing popularity of ProGEO in the European countries. Some weeks ago some members of ProGEO Executive Committee and myself were informed by our enthusiastic Portuguese Friends that a National Group with 39 (!) ProGEO members had been established in Portugal with plans, programmes, etc. Another piece of good news comes from Ankara, Turkey. As a result of the organised by ProGEO Workshop in Izmir in the end September this year a Turkish ProGEO National Group has been established with a plan to organise, in the beginning of the next year, a national conference on geological heritage conservation. Nice news, aren't they? Congratulations to both countries and cordial wishes for accomplishment of their first ideas! They are most welcome to the big ProGEO Family!

The fourth detail is that ProGEO Working Groups have also been more or less active during this year. I am sure they will continue their useful work on all the problems of the conservation of geological heritage in different European regions. I hope very much a South Group of ProGEO will be established soon and some of the countries will become again as active as they were in the past.

Unfortunately in the beginning of January we lost our Past President Dr. Walter Krieg. He passed away in the most active years of his life but we will never forget his contribution to the establishment and development of ProGEO as a whole. Our Friend from Bashkiristan lost his wife. Let's remember these and all the other ProGEO Friends who have left us.

My big personal regret for a promise I could not keep. I did not succeed with the preparation of the instructions for the questions/problems for the papers related to the book "Geoconservation in Europe", a project I had planned to recover. But I will continue to work on this important for ProGEO Project and I hope very much that we will inform the European authorities and the world about all we have done by now in the field of geoconservation.

In the end I will say I am a little (only!) disappointed that the development of UNESCO Geopark Programme did not follow its preliminary intentions and scheme and is still not adopted. I think this Programme is a very important document supporting the realisation of many interesting Projects in Europe and the world. I hope the competition between different associations, organisations, foundations and some personal oppositions will be overcome and the Programme will become again the uniting document to which ProGEO has special interests and would like to be involved for further development of the conservation of geological sites and parks.

In conclusion I think I can report the year 2000 was successful for ProGEO and its Members, and give my Season's greetings to all ProGEO Members and Friends and their families with wishes for good health, personal luck and prospective New 2001 Year, New 21<sup>st</sup> Century and New 3<sup>rd</sup> Millennium! Good chance to every one of you, Dear Friends!

**Todor**



### EUG-Meeting in Strasbourg 2001

#### Symposia : "Geological conservation, public awareness of geosciences and the image of geologists"

I wish to inform all of you that proposal "Geological Conservation, Public Awareness of Geosciences and the Image of Geologists in the New Millennium" was recently accepted as symposia L9 in the Other Symposia-session of the European Union of Geoscientists (EUG) Meeting to be held at april 2001 in Strasbourg. I wish also to apologise, because when proposed, I was not aware about the decision made recently in Prague, in order to limit the number of meetings concerning the geological conservation. When I knew that, I tried to eliminate the topic of the symposia, but unfortunately it was too late - the second circular was readily in press. In all cases, please see details of the symposia below:

L9 Geological conservation, public awareness of geosciences and the image of geologists in the new millennium

Convenor: Toni Eerola (Helsinki)  
tonieve.eerola@kolumbus.fi

This symposium will reveal some of the important current issues for professionals of geosciences and their relationship with society, from different perspectives.

It was in the late 1980's, when geologists all over the world started to concern about the great need for public awareness of geosciences. In the 1990's, this concern was increased by increasing global environmental problems for which geology could offer solutions, crises affecting public funding for geological research, and restrictions for mining activities. Increasing pressure on the environment by economic activities caused concern also for preservation of geological heritage and efforts for conservation of geological sites started at a European level.

To improve the image of geologists and to increase general appreciation of the need for geologists, there is a need for education of the general public, decision-makers and the industry, to be offered by geologists. This should be made through campaigns and popularisation of topics related to geological sciences.

The symposium will try to give an overview of related questions, to discuss case studies and different methodologies used to promote public awareness and geological conservation at a European level. The symposium will also try to propose solutions and guidelines for the future.

The web information on the EUG website:  
<http://eost.u-strasbg.fr/EUG>

I hope there will be a good participation of the ProGeo members and other interested in public awareness of geosciences. Let's see in Strasbourg! And once again, I'm sorry for that!

Toni Eerola



### Brazil

#### Brazilian Commission of Geological and Paleobiological Sites

I participated recently on the 31st International Geological Congress in Rio de Janeiro and there was a Special Symposia dedicated to Geological conservation. Session was very interesting, with several important contributions from all over the world. Among them, Dr. Diógenes de Almeida Campos presented a current situation of the geological conservation in Brazil. I had also a pleasure to met other of two Brazilian convenors of the session, Dr. Emanuel Teixeira de Queiroz from the National Department of Mineral Production – DNPM and integrant of the Brazilian Commission of Geological and Paleobiological Sites (Comissão Brasileira de Sítios Geológicos e Paleobiológicos – SIGEP). So, our Brazilian colleagues have also been mobilised to promote geological conservation in their country under the UNESCO's World Heritage Committee. If you are interested in SIGEP's activities, please check their web-page on

<http://www.unb.br/ig/sigep/index.htm>

Beginning from the next year, I will be working in Brazil and I hope to be able to contribute to Brazilian work on the geological conservation, as well as to inform the ProGeo about its progress.

Toni Eerola



### ProGEO Web

<http://www.sgu.se/hotell/progeo/>



# NEWS



## Vth National Meeting, Spain

Vth National Meeting of its Geological Heritage Commission

The Sociedad Geológica de España (SGE), in collaboration with ProGEO, has pleasure in announcing the Vth National Meeting of its Geological Heritage Commission, to be held in Molina de Segura (Murcia, Spain) from 16 to 19 May 2000.

Oral communications and posters about different issues such as Geological Heritage and Natural Parks; Legislation; Scientific, the cultural and educational value of Geosites; Management of the Geological Patrimony; Geotourism, Geoparks and Museums; Inventory and Cataloguing of the Geological Heritage; Conservation and the uses of the Geological Heritage and Geoconservation initiatives will be presented.

Three field trips, on 15, 17 and 20 May, are planned to examine the important Geological Heritage of the Murcia Region.

Information and registration forms in: <http://www.um.es/VReunionCPG>.

*Francisco Guillén Mondéjar*



## Portugal

It is with the greatest pleasure that I announce the formal establishment of a committee and national ProGEO group for Portugal (list below). We all met colleagues from Portugal at Madrid and were impressed by their enthusiasm for geoconservation. I am pleased to announce that Dr José Brilha is to be the new group's representative on the ProGEO Council: welcome to him! Through him, I have welcomed news members on your behalf.

Several colleagues joined the association in Madrid, but you will be interested, and I hope very encouraged, to learn that thirty seven (yes, 37!!!!!!) colleagues from Portugal have simultaneously paid their membership subscription in recent days. An example to us all.

Now ProGEO Portugal is formally constituted, we can look forward to our colleagues playing their full part in the Southern Working Group and ProGEO as a whole.

*W.A.P. Wimbledon  
Ex. Sec.*



## Treasury function in ProGEO

**Present state report:**

Following the decision at the Prague meeting in June, several actions in order to establish the Treasury function in Uppsala, Sweden have been taken. Registration of ProGEO as an official non-commercial organisation required some authorised documents; accountancy, Council protocols, auditor's report, a.o. These actions could be initiated in September, and circulation of documents brought us to late October until all necessary documents could be handed over to the Swedish tax authority. Registration of ProGEO became official as from November 8 2000.

Our Organisation Number is **817605-8769**.

The following official message is stated by the tax authority. **You have been assigned an organization number. An organization number is an identity number which legal persons are assigned by law. Your organization number should be given next to your name when you get in touch with Swedish authorities and enterprises.** The official address for the Organisation is :  
**ProGEO  
Box 670 /SGU/  
SE-751 28 UPPSALA  
Sweden.**

As from now, official communication to Chairman, Executive Secretary and Treasurer should be addressed as stated above. Letters will be forwarded to the addressee.

The ProGEO logo/trade mark is being registered as seen in the ProGEO Homepage, and in black and white, which means it covers all possible colour variations. When registered, the symbol will appear next to logo.

At present, several discussions with Swedish banks are underway. Unfortunately, cost for money transfer from member states is so far unacceptable, but returning from discussions with a larger commercial bank, to which we offered sponsorship, we hope the matter will be solved. Not until then will we be able to advise you about bank, bank account, cheapest way of transfer a.o. The Financial committee and Treasurer apologize for this delay and inconvenience this may have caused you all.

To the national representatives in those countries that have discussed reduced member fees, please contact Treasurer with your suggestions as soon as possible.

Gunnel Ransed, Treasurer

Lars Karis, Financial Committee



## Important Web site

The Geosites Documentation Centre's web site at the following link:

<http://www.arch.unige.it/sla/geotopi/index.htm>

Gerardo Brancucci



Screen dump of the home page



## First circular

The European Association for the Conservation of the Geological Heritage, ProGEO

Meeting of the ProGEO Working Group No. 3 Northern Europe.  
Latvia, May 24-27, 2001.

**Aims of the meeting:** to strengthen international co-operation in the field of conservation of geological heritage, evaluate state-of-art of preparation of national and North European geosites lists, introduce with state-of-art of geoconservation and current activities in Latvia.

**Latvian Organizing Committee:** Aivars Markots, (chairman of Latvian ProGEO group, University of Latvia); Inga Gavena (vice-chairman of Latvian ProGEO group, State Geological Survey Latvia)

**Advisory board:** Jonas Satkūnas (Leader of the WG No.3), Carl Erik Johansson (ProGEO Past president), Lars Karis, Gunnel Ransed (secretary), Rein Raudsep.

**Organizations involved and supporting the meeting:** State Geological Survey of Latvia, University of Latvia (Rīga), Geological Survey of Lithuania, Geological Survey of Sweden.

**Meeting place:** University of Latvia, Rīga, Alberta Str.10.  
Tel: 7332566, Fax: 7332704, e-mail: amarkots@lanet.lv

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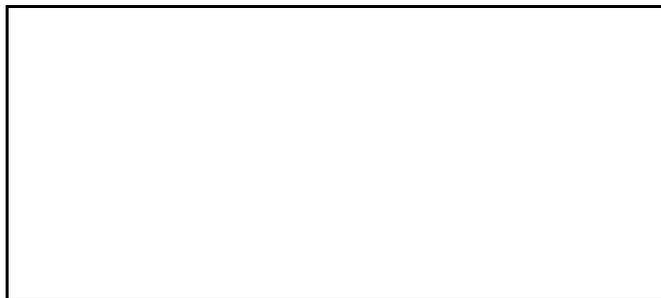
**Deadline for contributions to next issue of ProGEO NEWS: 01.03.01**

**ProGEO:** European Association for the Conservation of the Geological Heritage. Adress: Box 670, SGU, SE-751 28 Uppsala, Sweden. **Treasurer:** Gunnel Ransted. **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.

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