



# NEWS

No. 1

1997

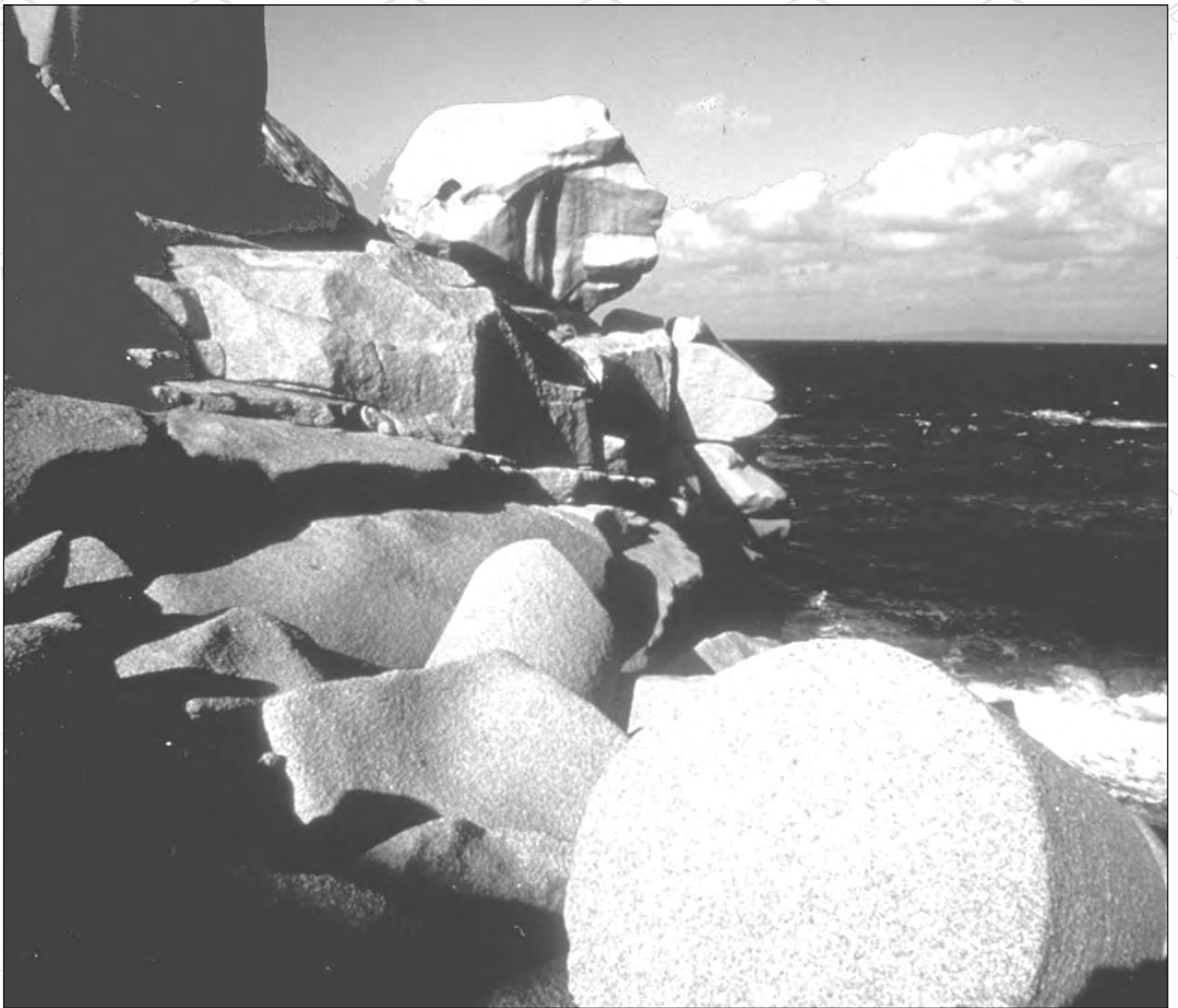


Fig.1 Capo Testa: We are in the extreme north of Sardinia island; the Hercynian granite basement is here shaped by the sea in astonishing figures. The Romans 2.000 years ago got here the columns for the Pantheon in Rome.



## Geosites in Sardinia

Sardinia has an extraordinary richness and variety of geological formations and geomorphological features. From

lower Cambrian until recently stratigraphic sequences, intrusions, foldings, volcanic cycles, paleogeographic events succeeded, producing a great number of geosites. A considerable (1.849 km) extension of the coast line and long periods of strong erosion permit a good exposition of the geological rarities.



Fig. 2 Corropu Canyon, near Nuoro, middle Sardinia: a tectonic-erosional deep canyon in the Supramonte plateau (Mesozoic limestones). One of the wildest areas in the Mediterranean region.

The Regione Sardegna, with the regional law no 31/1989, pointed out a first list of 22 geological monuments. The protection of 15 geosites was afterwards established by «Assessorato Difesa Ambiente». They, indicated with their town, province and short geological data, are:

- 1 Pan di Zucchero e Faraglioni di Masua - Iglesias (CA) - Cambrian limestone islet with faraglioni.
- 2 Perda Liana - Gairo (NU) - Jurassic limestone tower (alt. 1293 m).
- 3 Capo d'Orso - Palau (SS) - Hercynian granite outcrop with tafoni.
- 4 Perda Longa - Baunei (NU) - Coastal pinnacle, Cretaceous limestone.
- 5 Texile de Aritzo - Aritzo (NU) - Jurassic limestone tower (alt 975 m).
- 6 Le Colonne - Carloforte (CA) - Cenozoic ignimbrite columns

7. Punta Goloritzei - Baunei (NU) - Coastal pinnacle (143 m), Mesozoic limestone.
- 8 S'Archittu di S. Caterina - Cuglieri (OR) - Coastal natural tunnel, Miocene limestone.
- 9 Su Sterru - Baunei (NU) - Sink-hole (270 m deep), Mesozoic limestone.
- 10 Su Sercone - Orgosolo (NU) - Large collapse doline, Mesozoic limestone.
- 11 Monte Pulchiana - Tempio (SS) - The greatest granite inselberg in Sardinia.
- 12 Basalti colonnari - Guspini (CA) - Old quarry with columnar basalts.
- 13 Domo Acquafredda - Siliqua (CA) - Andesite dome in the center of a plain.
- 14 Scala di S.Guorgio - Osini (NU) - Canyon in Mesozoic carbonate rocks.
- 15 Crateri vulcanici Meilogu - Giave (SS) - Cenozoic lava and pyroclastic flows.

**The 7 geosites not yet protected are:**

- 1 Arco dell' Angelo - San Vito (CA) - Valley in Hercynian granitoid rocks.
- 2 Canal Grande Nebida - Iglesias (CA) - Inlet, Cambrian Strata with Trilobites.
- 3 Colata Basaltica Gollei - Dorgali (NU) - Plateau with columnar basalts.
- 4 Valle Rio Pardu - Gairo-Ierzu (NU) - Valley with schists and Jurassic limestones.
- 5 Tronchi fossili Zuri - Tadasuni (OR) - Petrified forest (Miocene).
- 6 Grotte Litoranee Baunei - Baunei / Dorgali (NU) - Coastal karstic grottoes.
- 7 Vette dei Settefratelli - Sinnai (CA) - Thor and tafoni in Hercynian granite.

Many other geosites need a regional project for their characterisation, listing and conservation. The inventory must regard not only geomorphological and lithological types, but stratigraphical, tectonic, mineralogical and paleontological ones also. Therefore we suggest the introduction of Geosite concept (IUGS-UNESCO) in the Sardinian environmental legislation.

Raniero Massoli-Novelli  
(text and photos)



## President's square

When you see this you have hopefully received another invitation and call for papers to ProGEO '97. Soon it is June, and we look forward to meet in Estonia. The preparations for ProGEO '97 go on with an increasing intensity and a continuous accuracy. It is my pleasure to experience the work of Rein Raudsep and his colleagues among geoscientists and nature conservationists in Estonia. They have very much to show.

Other good news is that the Swedish Environmental Protection Agency has decided to give strong financial support to plan, perform, document and evaluate ProGEO '97. This intends to make it possible for friends from Eastern Europe to come and take part. ProGEO '97 should be a model of international knowhow conveyance with special regard to geoconservation. There are also chances to get funds from Finland to Karelian and Russian friends, and from Norway to finance participation of friends from South-eastern Europe.

As stated previously I expect well-prepared contributions, first of all brief abstracts - no novels, please - to be published in the brochure of abstracts. Well-made manuscripts will improve the chances of fine presentations, finally in the proceedings, and constructive knowhow conveyance. Our Estonian colleagues pay much efforts and money to publish the proceedings.

More good news: There is a first inventory of the Geological Heritage - Premier Inventaire du Patrimoine Géologiques - going on in French Nature reserves. The

first preliminary stage has already proved the geological importance of reserves. It contributes to the definition of criteria for the evaluation of the rich French geological heritage. There is much to perform in France according to the ProGEO ideas of Geosites, no doubt.

There was a fine seminar on Quaternary Geology and Nature management, including protection, in Trondheim, Norway. I learned a lot. Norwegians are champions not only in skiing. Seminars like this one should take place in every active ProGEO country, in representative branches of Geosciences. The tree of Geoscientific knowledge has many branches, from the bedrock roots to the recent wind-blown dunes. There is a promising one in Athens this summer. What country will arrange the ProGEO Seminar of the year?

We have just started the Nordic project Geodiversity in Nature conservation. It is supported by the Nordic Council of Ministers. As Gerard Gonggrijp showed once: It's not only biodiversity. The project has strong connections with Geosites. By the way we have a Northern Europe regional ProGEO meeting in Tallin in March. Some results will be presented at ProGEO '97. There will be an important regional meeting in Krakow in October.

Finally, some bad news: Some members have not yet paid the membership fee. Please convert them to good news as soon as possible!

Carl Erik



## Southern Africa joins in GEOSITES

A workshop has been organised for representatives of southern African countries to discuss geosites listings for Africa: application of criteria and proposals.

The meeting will take place at the University of Witwatersrand in Johannesburg on 7th March, hosted by the Geological Society of South Africa and various governmental organisations. ProGEO's secretary will be representing the association and spreading the ProGEO philosophy of collaboration.

Bill Wimbleton



## Elections

Council members eligible to vote this week received their notices on the election of the new Executive Committee.

Members will be interested to see the new team :

ProGEO 1997 Elections 2: Council elects new Executive Committee

New:

Prof T.A. Todorov (Bulgaria) President

(see Election notice1)

Dr Irene Theodossiou Drandaki (Greece)

Dr Ernst R. Look (Germany)

Dr Dusan Mijovic (Yugoslavia)

Remaining:

Dr Lars Erikstad (Norway) ,Vice President

Dr Gerard P. Gonggrijp (Netherlands), Project officer

Dr Alf Grube (Germany), Treasurer

Dr Lars O. Karis (Sweden), Chairman finance committee

Dr Rein Raudsep (Estonia)

Dr Francesco Zarlenga (Italy)(coopted for last year)

Dr W.A.P. Wimbledon (UK), Executive Secretary

Past Presidents (automatically coopted to committee):

Dr Carl Erik Johansson (Sweden)

Dr Walter Krieg (Austria)

Dr George P. Black (UK)

As you can see we propose a balance of former active members and several new colleagues who have made their mark in geoconservation in their own countries and regions. Dr Look and Mrs Drandaki both are taking a leading role in their national geological surveys, promoting the conservation cause. Mr Mijovic has given a considerable impetus to geoconservation work in Yugoslavia.

Thanks go to retiring members of the committee, especially Dr Veli Suominen and Dr Odon Radai, who have played a key role, especially in organising meetings in recent years.

Executive Secretary



## ProGEO '97 in Estonia

The second circular and call for papers to ProGEO 97 in Estonia is recently sent out. The arranging bodies are the Estonian Ministry of Environment, the Geological Survey of Estonia, the Geological Society of Estonia, Tartu University and Tallinn Technical University. ProGEO 97 is supported economically and personally by Finland, Norway and Sweden.

The goals of ProGEO 97 are the General Assembly formal sessions, scientific seminars on site selection, data-banks, geotopes and architecture, general policy of geoscientific nature conservation, business meetings, excursions and field trips.

The scientific programme and General Assembly will take part in the Tallinn Town Hall and Vösu, Lahemaa National Park June 2 - 4. There will be intraconference excursions in Old Tallinn, Lahemaa National Park, in NE Estonia and postconference excursions to previously military Pakri peninsula, and to fascinating Saremaa Island. ProGEO '97 ends June 7 in Tallinn.

Abstracts of papers will be released in a Volume of abstracts before the meeting. The most interesting papers will be selected for oral presentation and published in the Proceedings of ProGEO '97. The deadline for abstract manuscripts is March 15. Filled-in registration forms are to be returned to Geological Survey of Estonia the same day. The deadline for payment is April 30.

The ways to go to Tallinn are by railway, ferries from Germany, Poland, Sweden and Finland and aircraft. Interesting ways are flights to Stockholm or Helsinki and ferries from there. Tallinn is a fascinating city with good hotels and Estonia a lovely country, so arrivals on Saturday using Apex, Jackpot or similar tickets to press the travel costs will give good opportunities of memorable experiences connected with ProGEO 97.



More information will be given by the contact persons Dr Rein Raudsep as to papers, abstracts and financial questions and Mrs Maire Sakson as to accommodation, transports and excursions. Their address is Geological Survey of Estonia, Kadaka tee 80/82, EE0026 TALLINN; phone +372 2 593 964, fax +372 2 579 664, e-mail egk@estpak.ee.

Rein Raudsep & Carl-Erik Johansson



### Membership fees

A large amount of worry and effort has been introduced into the work of the treasurer (and secretary) in recent weeks, chasing payments for membership. Despite the best efforts, some have still missed the 31 January deadline for paying their subscription: as a result they miss their chance to vote in this year's elections, which is a great pity. Thanks to those who paid on time or kept the treasurer informed of developments and difficulties. Those transmitting money for others are asked to contact the treasurer with news.

Please support ProGEO's officers, your officers, in their tasks, especially by helping to keep to timetables. Many thanks

Executive Secretary



### Fossil pilfering

Last summer, the first Swedish case of «trivial theft of fossils» drawing general attention happened on the island of Åland. A small group of European tourists spotted a heap of Ordovician limestone blocks in a field not far from the road and decided to crack some of them open in search for fossils. Their activities were observed by local people and, whosh!, there was the

nature warden living next-door. The «hunten» apologised and explained he expected no offence in hammering loose material lying around. Instead of enjoying the Swedish summer, he spent the rest of the day (and another, as a matter of fact) at the DA's office on the mainland explaining his behaviour, and after brief questioning, he was sentenced to a fine of SKR 500. As the extracted shells «had insignificant commercial value» the verdict read «shoplifting». Evidently the policeman had never attended a fossil/mineral exhibition and fair in Central Europe, then he would know about prices!

Conclusions: Firstly, actors in protection of our geological heritage will have to present an accurate and up-to-date information and general guidelines about applicable rules and laws that can be handed out at national borders. Many such cases will definitely create a bad-will towards a country.

Secondly, if you find a nice piece of naturalia, also find the landowner and get his permission to bring it along. In most cases there will be no problem obtaining such a permit and, under such conditions, collection of erratics is allowed outside protected areas such as nature reserves or monuments.

(Background material was kindly provided by journalists at Barometern a main local news-paper in Kalmar, SE Sweden.)

Lars Karis



### Membership Growth

Association enthusiasts will be pleased to hear that nearly forty people have applied to join ProGEO since the wonderful meeting in Roma! This great success shows the growing interest in our association as a worthwhile contributor to geoconservation. It is a sign also that the word is spreading. Requests have come from other continents, from Africa and Asia, asking for information about ProGEO.



Those European countries with one or two members are rapidly being left behind. We must be pleased with the success of growing numbers, but we must be careful to keep a balance between the countries. So all are asked to continue to recruit for ProGEO at home. Get your friends and colleagues to join. Let us keep up the momentum.

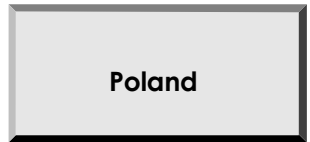
Bill Wimbledon

ting in ProGEO activities!

So, if it has not been done, write to the secretary and tell him:

- 1) who is your country representative
- 2) send the secretary the names of those in your country geoconservation network

Bill Wimbledon



A number of countries have informed the secretary of developments in forming links and work amongst their country ProGEO networks. Recent elections in Kiev elected Dr Natalia Gerasimenko as the representative for the Ukraine, to act as the contact point for the growing membership in this the second largest country in Europe. In Yugoslavia, Mr Dusan Mijovic has been nominated to act on behalf of Montenegro as well as Serbia: which I am pleased to announce. Dusan has been very active forming specialist networks in Serbia. Finland has nominated a new representative also, Dr Martti Lehtinen of the Helsinki Museum. We wish him welcome to our association.

In recent months, the secretary has written to several countries asking them to make sure they inform the Association of their nominated representative. This is important when it comes to election time and council participation. Every country must be represented on the council.

If your country has not contacted the Executive Secretary and informed him of developments, of the growth of a country network, or the election of a representative, please do so as soon as possible.

If you are developing a contact network for geoconservation in your country, pass on the names of people involved to the secretary. They should be joining ProGEO, receiving the ProGEO newsletter and participa-

### New prospects of geoconservation

The brief information about the achievements of geological heritage conservation in Poland was presented in the ProGEO News (1/1995). The project «Lithosphere conservation» as the governmental programme of eco-development policy is closed. The next one «Conservation system of geodiversity in Poland» is starting now. It is supported by the Ministry of Environment Protection, Natural Resources and Forestry and co-ordinated by the Polish Geological Institute (Geological Survey).

The leading idea of this project is the promotion of geodiversity side by side to biodiversity. Institute of Nature Conservation of the Polish Academy of sciences considerably participates in the programme «Geodiversity». The idea of geodiversity focusing on the protection network and the regional list of geosites is the principal part of this programme. The project promotes international co-operation leading to the list of geosites of Central Europe (see this issue of ProGEO NEWS). The other part of the above mentioned programme is components of geodiversity such as substratum, soils, water and landscape. This programme is performed in co-operation with the Polish Geological Institute and the University of Poznan.

Scientific/popular guidebooks relating to some regions of Poland will be edited by the Polish Geological Institute in the next three years. The geologists of the



Institute of Nature Conservation will participate considerably in preparation of such guidebook for the Carpathians.

The model of geodiversity conservation of this region is presented in the edited book (Z.Alexandrowicz (ed.), W.Margielewski, J.Urban, M.Gonera 1996. Geoconservation of the Beskid Sadecki and the Sacz Basin, Polish Carpathians. Studia Naturae 42, pp.148. Inst. of Nature Conserv., Pol.Ac.Sci, Krakow).

Zofia Alexandrowicz



### Election Procedures

Dear Colleagues,

You will remember the first draft of the guide to elections distributed at the Rome meeting, and subsequently appearing in the Newsletter. Below is the final version, incorporating all the suggestions of those members who commented. They have helped enormously, pointing out text which was vague or mysterious, and making it a better document.

There are no changes of the rules obviously, but we hope they are explained more clearly. Thanks to all concerned.

Executive Secretary

This guide sets out to explain simply the procedures for the election of ProGEO's President, General Members of Council and its Executive Committee, based on ProGEO's 1993 Articles.

#### General

If you are to vote in any election (of the President, General Members or the Executive Committee), your

subscriptions must be paid to the Treasurer by the last day of January preceding the general assembly. If you or your country has unavoidable exchange or banking problems, you must agree an alternative mechanism for payment with the treasurer by this date and no later. (If subscriptions have been waived for your country by the agreement of the Council (C., E. and SE Europe), no payment is required and you may vote). Candidates must be members (themselves subject to the last day of January payment rule),

#### A) Election of President

The election of the President is by open ballot at the General Assembly. The Secretary convenes a meeting of bona fide registered members on day one of the assembly for this purpose.

#### Procedure

- 1) As a member you have the right to elect the President, if you have paid your subscription up to date. (Late payment after January may occur, but this will not allow you a vote.)
- 2) The Treasurer will inform the Secretary of the names of registered members on 1st February.
- 3) The Executive Committee will nominate a candidate for President, and circulate this nomination to registered members by 1st February in an election year.
- 4) You as a ProGEO member may propose alternative persons. If you want to nominate someone as a candidate, you must ask him/her to write you a letter agreeing to be nominated, and send this letter of agreement and your nomination to reach the Executive Secretary by no later than 1st March.
- 5) An invitation to vote will be posted to all registered members by the end of March. You will be sent: i) a list of proposed candidates (and their nominator) ii) a voting paper, and iii) a coloured registered members card. If these do not arrive soon after the end of March, inform the secretary.
- 6) Postal votes are to be returned inside two envelopes. The inner envelope («President's election» envelope) is to be left unmarked. It should be sealed with your vote inside. The outer envelope should bear your



name and address. Your vote should reach the Executive Secretary no later than 7 days before the General Assembly.

- 7) At the General Assembly: a registered member votes by showing their coloured voting card. The secretary of the election committee will then read out postal vote results, and declare a result.

#### B) Election of General Members of Council

Council consists of:

- i) founder members: i.e. those European Working Group on Earth-Science Conservation members invited to the Weymouth 1992 meeting who contributed to ProGEO's articles, drafted by Dr G.P. Black ii) national representatives, elected by a country (if such has been elected), and iii) general members (elected by the General Assembly)

General members (GMs) are elected by the whole ProGEO membership. All registered members of ProGEO may vote in the election. Only one general member may be elected from a country. They serve between general assemblies (i.e. for up to four years). GMs are equivalent to twenty percent of the Council (at present there are 4 Gms). The election of GMs takes place, by open ballot, at the General Assembly.

#### Procedures

- 1) As a registered ProGEO member you may nominate another or yourself to be a GM of Council
- 2) Send nominations to reach the Executive Secretary by the last day of January, preceding the general assembly. If no new nominations are received, the President will consult council members to elicit nominations.
- 3) You may vote for general members at the General Assembly, or by postal vote if you cannot attend. Voting at the GA is by a show of coloured member's registration cards.
- 4) At the end of March in an election year the Executive Secretary will send you: i) a list of candidates, and ii) a postal voting form, for use only if you cannot attend the GA iii) a coloured members card
- 5) Send your postal vote to reach the Executive

Secretary by 7 days before the General Assembly at the latest..

- 6) Postal votes will be scrutinised by the election committee, and totals will be read out after the show of cards. The result will be declared by the President.

#### C) Election of Executive Committee

The Executive Committee (excluding the President) is elected by the Council. There are 2 years between elections in which to consider possible candidates.

The election takes place at a closed business meeting of the Council, convened by the Executive Secretary. This happens every second year..

If you are a council member and have paid your subscriptions up to date, you have the right to vote in the election of the Executive Committee. Late payment after the end of January may occur, but this will not allow you to vote.

#### Procedures

- 1) The Executive Committee, under the guidance of the President, has the job of making nominations for re-election of current officers, and new candidates for election. You can contribute to this process by passing your suggestions for candidates to the President or Secretary at any time through the year. The nominations decided by the Executive Committee will be posted to you by the end of February preceding the Council Meeting.
- 2) You may nominate an alternative candidate for a specified post on the Executive Committee.
- 3) Before making an alternative nomination, you must ask your potential candidate to write you a letter explicitly agreeing to be nominated, and send this letter of agreement and your nomination to the secretary, with a seconder's letter. A nomination must reach the election committee (post this to the Secretary) no later than the last day of March.
- 4) Two weeks later, the Executive Secretary will send each Council member: i) a finalised list of candidates (with names of proposers and seconders), ii) a voting paper, and iii) a coloured member's card. If these do not arrive soon after the end of March, in-





form the secretary.

- 5) You may still vote by post (or fax, if you choose), even if you are unable to attend the Council meeting.
- 6) Postal Votes: i) Return your completed postal vote form inside two envelopes. The inner envelope («Executive election» envelope) is to be left unmarked and should be sealed. The outer envelope should bear your name and address (see 6ii). ii) Do not mark the inner envelope or put your name on it, or the voting paper, because this is a secret ballot. iii) But, make sure you put your name on the outer envelope in which it is posted, so that the fact that you have voted is recorded. You may only vote once: either by post or in person. Your postal vote should reach the Executive Secretary no later than 7 days before the General Assembly. Fax votes will also be accepted, by the same date.
- 7) Postal votes (inner envelope) will be opened under the scrutiny of the Election Committee before voting at the Council meeting.
- 9) Ballot papers will have printed on them the names of candidates, and the job they wish to fill.
- 10) Voting in person at the council meeting: i) You vote by marking a cross against a candidate's name, and place your paper in the box. ii) Do not put your name on the paper. iii) When you vote, you must show your coloured voter's card.
- 11) The President will declare the result, as soon as the counting is satisfactorily completed.

### Application of the rules on Elections

Elections are supervised and scrutinised by an Election Committee, consisting of the current President and past presidents (and such senior members as they may wish to co-opt); as impartial persons they will judge the running of, and any dispute or irregularity in, the elections. Any problem or dispute will be referred to the committee, and a decision given by them in writing, after full consideration of the facts.

WAPW 21.3.96, revised 14.4.96, revised 12.1.96



## New representative for Spain

It is a pleasure to announce that a new representative will be attending ProGEO meetings on behalf of Spain. He is Dr A. Perez-Gonzalez, who has been elected as the new chairman of the Spanish Heritage Commission. Discussions have been restarted with Spanish colleagues on the postponed annual ProGEO meeting in Spain; they have been seriously discussing the possibilities. Members will remember that we were due to meet in Spain in 1997. We look forward to much cooperation with Dr Perez-Gonzalez and the newly elected committee of the Spanish Commission.

Executive Secretary



## Symposium

### Natural Monuments and Geological Heritage

The 2<sup>nd</sup> international symposium «Natural Monuments and Geological Heritage» is organised by the Natural History Museum of Lesvos Petrified Forest and Institute of Geology and Mineral Exploration (IGME) at the Molyvos Conference center, Lesvos Island, Greece, from June 30 to July 2, 1997. Language will be Greek-English with simultaneous translation.

The main aim with the Symposium is to present the results of the research concerning promotion, the evaluation criteria, the designation and the protection of the natural monuments and the geological heritage. Topics will be: -Geological natural monuments - Geological heritage and geotopes network - Management of protected areas - Legislation - Promotion, protection of natural monuments in Greece and in the Balkan countries - European Union and geoconservation - The World Heritage



List of UNESCO - Geoconservation and environmental education - Geotourism. Participation fee: 40 USD.

Researchers interested in participating in the Symposium are kindly requested to send the title and abstract on a floppy disc (Word for Windows) of their paper before the 10th of April, 1997 to the following addresses:

- Nikos Zouros, Natural History Museum of Lesvos Petrified Forest, Sigrí, Lesvos Island, 81112, Greece; tel/fax: +3025147033, e-mail: n.zouros\*geo.aegean.gr-Irene Theodossiou-Drandaki, IGME, 70 Messoghion str. Athens 11527, Greece; Tel: +3017757331, Fax: +301 7752211, e-mail: REN@quartz.igme.ariadne-t-gr



## Successful Seminar

### Successful Seminar on Quaternary Geology and Nature Management in Trondheim

In February a co-operative seminar on Quaternary Geology and Nature management was arranged by the Geological Survey of Norway (NGU), the Directorate for Nature Management (DN), the Norwegian Institute for Nature Research (NINA-NIKU), the Directorate for Nature Management, the Ministry of Environment and the University of Bergen. The seminar took place in NGU, Trondheim. It gave many-faceted information and ideas of geosciences, nature conservation and management of natural resources in national as well as international perspectives.

Lars Erikstad, NINA and ProGEO, was one of the geoscientists who initiated the seminar and contributed to the planning and performance. Carl Erik Johansson and Bill Wimbledon, representing ProGEO and the GEOSITES project, had the pleasure to take part and experience two successful days that strengthened the prerequisites of co-operation between different parties involved in sustainable use of natural resources and nature management.

In the introductory part there were informative speeches on Quaternary Geology and processes. In the second part: International perspectives - Geodiversity Johansson presented ProGEO, Jon Suul of DN informed on Nordic co-operation in the wide field of Nature conservation, and Bill Wimbledon gave aspects of international geoconservation: from top unique sites to local efforts. Lars Erikstad showed landscape and geodiversity, and Odd Stabbetorp, NINA, gave glimpses of geology and biodiversity.

In the third part: Management - protection and exploitation there were interesting aspects of site protection, geological consequences of nature impact from exploitation, resource management and geosciences, the relation between the ballast production branch and the environmental administration, and economical problems of nature protection.

The second day revealed operative means and planning. Jon Markussen showed instructive plans and examples of planning, environmental impact analyses and nature protection efforts from the building of an expanded international airport for the Oslo region in the famous ice-marginal delta of Gardermoen.

There were constructive group works with interesting presentations and discussions demonstrating the need and will of further contacts and co-operation in the geoscientific - nature management and conservation field.

Carl Erik Johansson



## Geosite workshop:

### Draft candidate list of Geosites representative of central Europe

The first workshop of the central Europe Working Group ProGEO will be organised in Poland by the Institute



of Nature Conservation of the Polish Academy of Sciences and the Polish Geological Institute. The guideline discussion about draft regional lists and the selection of the most important central European geosites will be the aim of this workshop. We hope the representatives invited from the Czech Republic, Slovakia, Hungary, Ukraine, Belorussia, Lithuania and Latvia will join the realisation of the project «Geosites» under the guidance of the Global Geosites Working Group IUGS/ProGEO. We hope this workshop will result in producing the first lists of proposed geosites from some geological regions of central Europe: Sudetes, Carpathians, Lublin-Lvov Basin, Roztocze, Malopolska Upland and Middle European Lowlands.

Information about the workshop:

Time and location: October 14-17, 1997, Krakow, Poland.

Programme:

October 14-15, 1997 - conference in Krakow, discussion about draft lists presented by participants.

October 16-17, 1997 - field trips in the vicinities of Krakow: the Crystal Caves and geosites in the Salt Mine «Wieliczka» and protected sites and areas in the Krakow Upland (Jurassic and Cretaceous).

Address of workshop organizer: Institute of Nature Conservation, Polish Academy of Sciences, ul. Lubicz 46, 31-512 Krakow, Poland. fax + 48 12 210348 e-mail: noalexan@cyf-kr.edu.pl

Zofia Alexandrowicz



### Symposium

#### Engineering geology and the Environment

The Greek National Group of the International Association of Engineering Geology (IAEG) invites to the Athens

1997 IAEG Symposium, on the Environment. The place of the symposium is Athens Hilton Hotel and the event starts monday June 23 and goes on for a week. Very good excursions are planned both within the symposium and after. Among the main themes of the symposium is «geological and historical heritage». If you wish to attend this excellent meeting, contact: Symposium Secretariat, PO Box 19140, GR-11710 Athens, Greece Telephone : 31 1 38139000 Telefax: 3467455. Full information and registration forms are available on the Internet at the URL adress: <http://www.traveling.gr/engeol>



### Geosite of the year

#### The Jostedalsbreen glacier, protected geotops in Norway

The «Jostedalsbreen National Park» covers an area of 1230 km<sup>2</sup>. This includes the glacier Jostedalsbreen, which covers 487 km<sup>2</sup> and it's surrounding areas with smaller glaciers. As geotops, the glaciers were the main reason for establishing of the Park.

The glacier consists of an ice cap with a number of ice falls, valley glaciers, ice aprons, cirque glaciers and regenerated glaciers. Continually accumulation in the previous years has now lead to advancing glacier fronts. As an example, the valley glacier Nigardsbreen has advanced around 140 meters since 1990. The Bergsetbreen glacier, which for many years has been an ice apron, now has change to be a valley glacier. In the same way, our generation has defined the glacier Bøyabreen to be a regenerated glacier. The regenerated part is now no longer isolated, but is a part of the rest of the glacier and will to day be called an ice apron. New moraines are formed and trees are run over by ice. Process related definitions of geotops as these are linked to time and the development of nature will change their classification.



P1 - The Bergsetbreen glacier in 1995.

The National Park includes many of the moraine systems, which belongs to the glacier, and gives unique possibilities of studying the glacier changes and changing of landscape caused by glaciers. The «Little Ice Age» here are defined to have culminated around 1750. The outermost moraines from this time are generally well marked. Unfortunately the border of the National Park is several places drawn between the glacier and the outermost moraine. Therefore the complete moraine systems are not covered by regulations for all glacier outlets.

To protect the moraines belonging to the Nigardsbreen glacier a Nature Reserve was created in 1985, 6 years before the establishing of the National Park. The Nigardsbreen glacier has historical interest because the glacier in 1743 advanced over cultivated land and de-

stroyed a farm called Nigard. Historical reports suggest that the glacier advanced almost 3 km between 1710 and 1743. An application was sent to the king Fredrik V of Norway/ Denmark to give economical compensation.

Successively younger moraines are found along the 2.5 km marginal zone between the 1748 and the 1937 position. The moraines from 1937 mark a major change in the valley landscape. After this year a lake was exposed. The glacier retreated relatively rapidly up to 1975. In 1966 solid rock was exposed between the glacier and the lake. The glacier withdrew farther about 900 meters and got its innermost position around 1988. Between 1988 and 1996 the glacier front has advanced 140 m.



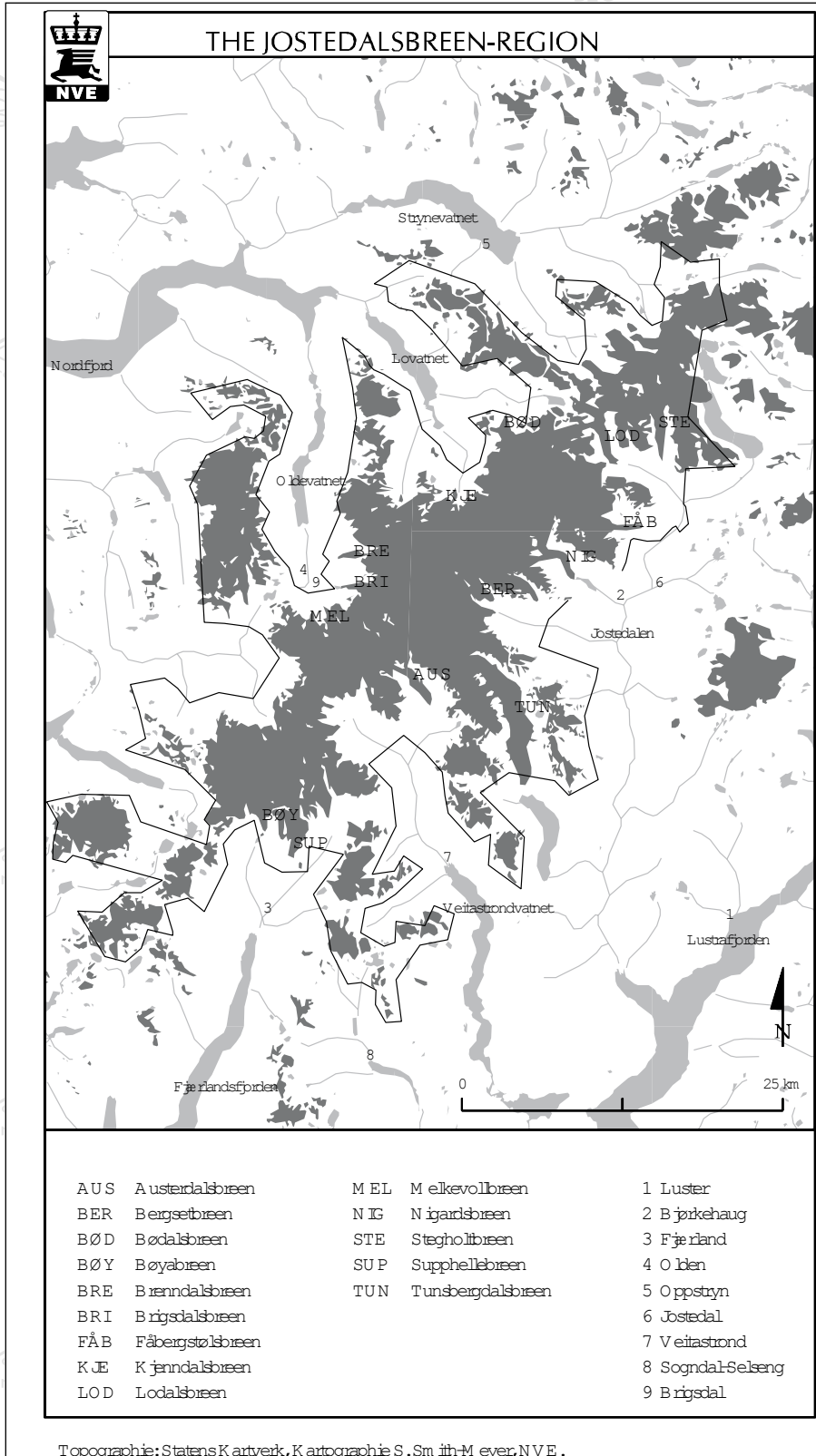
- The Bergsetbreen glacier in 1974.

When the glacier retreated from the lake, a small delta started to form by the glacier-river outlet. The accumulation of sediments on the delta is measured each year. The inner part of the lake is now filled by sediments.

Measurements of the Nigardsbreen mass balance and water discharge started in 1962. This was done because great interest in water power development was connected to the area. Because of suspected problems with sediments wearing and tearing on the turbines, measurements of the amount of sediments were started also.

Water power is no longer a relevant issue in the parts of the area protected as National Park and Nature Reserve. Other parts of the area are, however, are used for water power development such as the Tunsbergdalsbreen area south of Nigardsbreen and the Austdalsbreen area farther north (see below). The Power Company are imposed to pay for measurements and use Nigardsbreen as reference so that the long scientific series continue.

Another glacier outlet to be mentioned, is Suphellebreen in the southern parts of the Jostedalsbreen glacier. Its



outer moraine stretches outside the border of the National Park. This glacier, and its surroundings, is listed in the County geotop database and it is hope for a nature management strategy for border areas like this that will secure these areas as well.

Fåbergstølsgrandane is a tremendous sandur area some kilometres north of the Nigardsbreen glacier. The delta is near 10 km long and fills the whole valley. The glacier Stegholtbreen has its outlet in the middle of the sandur. Here a big hydroelectric dam was planned, but was not accepted due to the value of the geotop. Stegholtbreen is a glacier outlet of the same part of the glacier as the glacier Austdalsbreen, which is developed for hydroelectric power. The Austdalsbreen glacier is draining to the lake Styggevatnet, which is dammed. The dam has drowned excellent Little ice age moraine systems.

It is not possible to write about the Jostedalbreen National park without mentioning the tourism. The tourists are coming with buses or cars. Most of them visit only areas close to the road, perhaps with small trips on the outer parts of some valley glaciers. Museums are established both at the Nigardsbreen glacier and in Fjærland in the southern part of Jostedalbreen. Some souvenir shops, camping areas, huts and hotels are established in connection to the glacier, but not in a great number. Some of the hotels have traditions related to the river



- Early summer hiking in the National Park. The Suphellebreen glacier to the right.

fishing, but also glacier tourism back to the last century. The power development has in many ways made better possibilities to this form of tourism because of new roads and infrastructure.

Another form of tourism is people walking in the Park and spending several days on and around the glacier. Some of them use narrow foot paths, others choose

their route on their own. Water power developments have some places limited their traditional possibilities through damming of lakes, but the area still is an eldorado for activity like this. The area has a minimum of pollution and is big enough to walk around for some days, meeting only a handful of other people. Not too many places in Europe are still left for use like this.

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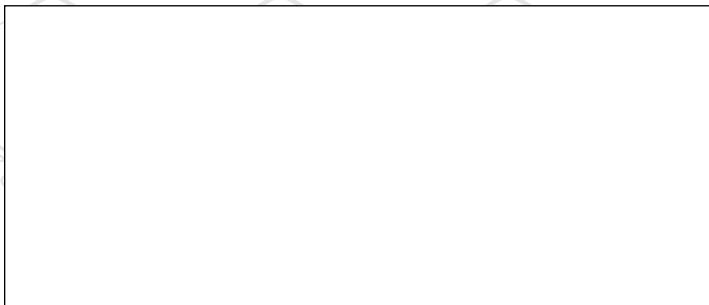
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