

INTERNATIONAL GEOSCIENCE EDUCATION ORGANIZATION NEWSLETTER 01-1

From the Editors:

Well, it has been awhile. A reorganization in the U.S. Geological Survey has kept me (Laure) so busy that my first passion, education, has taken a back seat. But with the waning of the summer here in the Western Hemisphere, it is time to get focused on IGEO and one of its goals that we try to meet through this newsletter - to foster communication between geoscience educators worldwide, at all levels.

Likewise, I assume that you are all very busy doing wonderful things in geoscience education and that is certainly evidenced by the submissions for this newsletter.

Perhaps the best news is our new affiliation with the International Union of Geological Sciences. Read all about this exceptional opportunity for IGEO in the message from the Chair of IGEO, Chris King.

Also, do not miss the update on the next GEOSCI ED Conference from the conference chair, Alan Morgan.

Please remember that this is your newsletter. Send in articles of interest to your global colleagues. They want to learn about new ideas and approaches in geoscience education, hear about new issues in the field, share in your successes and learn about issues specific to your country. In that same light, thank you to the 17 countries that have forwarded their Country Survey. Mary Dowse has taken on the task of analyzing the incoming questionnaires and will have a report ready for our next newsletter. In the meantime, we are looking at options for posting the surveys on the IGEO web page.

The Editors,

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FROM THE CHAIR OF IGEO: IGEO affiliates to IUGS

Yes its true, the International Geoscience Education Organization is to become affiliated to the International Union of Geological Sciences. This is the result of a good deal of background work by some members of IGEO (Alan Morgan and Ludwig Stroink in particular) and discussions between Senior Officers of IGEO and members of IUGS. The discussions resulted in the following proposal being put to IGEO Council in the recent Council email meeting: 'It is proposed that the International Geoscience Education Organization (IGEO) becomes an affiliated body to the International Union of Geological Sciences (IUGS)'. During the Council discussions, there was unanimous and generally enthusiastic support for the proposal from all those who contributed.

The advantages of affiliation that emerged from the discussions seem to be

1. IUGS has strong links with UNESCO (United National Educational Scientific and Cultural Organization) and ICSU the International Council of Scientific Unions) and liaises with a broad range of other organizations linked to Geoscience;
2. IUGS is the lead organization representing some ¹ million Geoscientists worldwide
3. IUGS has a permanent secretariat that allows it to 'quickly, efficiently and effectively promote geoscience initiatives'
4. IUGS may be able to provide IGEO with an annual grant of seed funding
5. IUGS may also be able to support new endeavors financially.

In return, IUGS will ask us to:

1. Keep them informed of IGEO progress;
2. Recognize any IUGS sponsorship;
3. Support IUGS in its own initiatives, as appropriate

With so many advantages and few suggestions of disadvantages, you can see why your Council gave the proposal enthusiastic support. Now that the proposal for affiliation has been accepted by IGEO Council, this news has been sent to IUGS and we await their response. However, given their recent Council deliberations, we know that this response is likely to be positive. Then we will negotiate ways of carrying our affiliation forward most effectively.

This is a great opportunity for IGEO. For the first time Geoscience Education has the full backing of the International Geoscience community and a mandate from that community to enhance Geoscience education across the globe. Not only that, but significant funding is likely to become available to support our efforts. With such moral and financial support, the future looks very promising indeed.

Chris King, on behalf of IGEO Council

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ANNOUNCEMENTS

REPORT ON THE NEXT GEOSCIED MEETING Report on GEOSCIED IV, Calgary 2003

The preliminary meeting of the Calgary 2003 GEOSCIED IV Local Organizing Committee (LOC) was held at the Geological Survey of Canada (GSC) in Calgary on June 21, 2001. Godfrey Nowlan, LOC Chair, called the meeting to gather local teachers and members of the Calgary and region geoscience organizations. John Clague, President of the Canadian Geoscience Education Board and Education Director of the Canadian Geoscience Council, represented the Canadian Geoscience Education Network (CGEN) and CGC. CGEN is the formal national hosting body for the 2003 Meeting. Alan Morgan, National Chair, represented IGEO. About 18 members participated in the meeting, and several sent their regrets because of other commitments.

Representatives included members of the teaching communities from junior school through to university; the educational liaison members of several Calgary-based geological companies and geoscience organizations; several national representatives of the larger geological societies in Canada; government workers, private consultants and interested individuals. Senior members represented both the Royal Tyrrell Museum of Palaeontology at Drumheller, Alberta and the Burgess Shale Foundation at Field in British Columbia.

The meeting commenced with Morgan explaining the background to IGEO and the earlier conferences, and IGEO's aims and expectations of the 2003 Meeting. He pointed out that a web site had been created and had been operational for over a year outlining some of the field trips and venues for the meeting. He expected that this would continue to be upgraded and refined as new materials were created and committees came "on-stream". The web site can be viewed at: <http://www.science.uwaterloo.ca/earth/geoscied/>.

Nowlan welcomed the representatives to the meeting, commenting that the successful turnout argued well for the gathering in 2003. He explained that Elspeth Snow had been hired as a conference organizer and as a formal liaison person for the meeting. Meeting rooms had been "booked" with the university; and accommodation room reserved at both the university residences and at the nearby Motel Village. Certain suggested theme sessions had been sent to him following the late May St. John's CGEN meeting and it appeared that different groups across the country were starting to prepare for the 2003 gathering.

There was a lot of general discussion about the aims and objectives of the meeting as well as concern expressed about the dates. Some members felt that the early-mid August schedule might detract from teachers attending the meeting since it was in their summer vacation. Morgan and others pointed out that this could also be an advantage since release time would not have to be found for Canadian teachers. Those coming from overseas (and perhaps elsewhere in Canada) could combine it with a vacation to this scenic part of the world. Morgan also pointed out that the dates had been carefully selected bearing in mind access to the mountains (the Burgess Shale locality and the Columbia Icefield for example) and the fact that a later date would interfere with the start of the earlier academic sessions in the United States. Other comments revolved around the nature and format of the fieldtrips; the creation and composition of the field guide and social events for the conference. Questions were also asked about the form and number of the workshops associated with the meeting.

The net result of the meeting was a great deal of enthusiasm, the promise on behalf of the LOC to keep up the momentum and (for some) a sense of relief that the 2003 Committee was finally off the ground and running.

More updates in future newsletters!

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ARTICLES:

Jurassic Man Visits Pliocene Man

It started in GeoSciEd II (Hawaii) when Glenn "Pliocene Man" Vallender of New Zealand learned that I am using a pen name in writing in science magazines. My alias - Jurassic Mike. Why "Jurassic" is a long story that I would love to tell to those who would be interested to know (see my email address below).

Since Glenn was working on some Pliocene fossils at that time, he became the "Pliocene Man", and we have been using these aliases in our cyber-communication. Such correspondence was doubtless fun. These names, however, are a bit anachronistic. Though my pen name connotes an age older

than his, I am actually a bit younger. In other words, there is a significant "unconformity" between us.

Early in July I had the chance to visit the terrain of the Pliocene Man --- New Zealand. It is indeed a geo-beautiful place; no wonder Glenn hinted at one point during the GeoSciEd II Conference to have one of the GeoSciEds in New Zealand. I know one day it will be there, perhaps in a not-so-distant future.

Glenn took me to Ashburton College where he teaches and showed me his laboratory. Although it is a General Science lab, its emphasis on Earth Science could easily be noticed. Photos of minerals occupied about half of a wall. And by the door is a computer which runs a multimedia Science program that Glenn himself has written. I was told that his students enjoy working on this computer for their General Science and Earth Science assignments.

The Vallenders then took me to the foot of Mt. Hutt to view the ski fields, an awesome site indeed. And prior to meeting the Vallenders, I had visited the clay cliff, the Akaroa crater lake, the snowy mountains in Queenstown and the Antarctic Centre. I missed seeing, however, the volcanoes and geysers in the North Island and the glaciers in the west coast of the South Island. My next trip in the future therefore, must include them. To top this all up, I lost a bit of my sanity and bungy jumped in Queenstown! NZ is after all the bungee jumping capital of the world.

GeoSciEd IV is yet two years in the future. Hopefully, this would encourage some of you to visit some of your colleagues in the geoscience community for business, holiday, or both, before the next conference.

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A Report on the GSA Meeting in Edinburgh, Scotland

Earth System Processes July 24th to 28th, 2001 Edinburgh, Scotland

The meeting, presented by the Geological Society of America and the Geological Society of London, was hosted by the Edinburgh International Conference Centre. It was sponsored by the British Geological Survey, the United States Geological Survey, the University of Edinburgh and the Edinburgh Geological Society.

As stated by the presenters, the meeting focused on "two major themes critical to advancing understanding of how our planet works. Earth System Linkages explores the relationships between the solid Earth, the hydrosphere, atmosphere, cryosphere and biosphere. Earth System Evolution examines the way in which processes controlling the nature of the planet have changed since the birth of the solar system 4,5 billion years ago. Both themes involve comparison with other planetary systems in the solar system and beyond. Both take into account critical extraterrestrial influences".

More than five hundred participants represented mostly the American and British professional and academic communities, although representatives from the European Community and Australia, China, Argentina, for example, were also present.

KEYNOTE PRESENTATIONS:

Monday 25th

Life's History with the Earth Presenter: Aubrey Manning

Manning referred to the Earth as the stage in which life developed its evolution, and how modification introduced in the System by life itself, modified the environment and, in consequence, conducted to modifications in life conditions.

He pointed out that evolution should not be understood as a process of replacement of several organisms by others, but one of continuous occupation of new ecological niches.

When talking about massive extinctions he underlined that what, at the scale of geological times appears as catastrophic, has actually taken a few millions of years, involving at least hundreds of generations of each species. He said that it is still enigmatic how these extinctions worked and that they were crucial for evolution, due to the fact that they generated new opportunities for the remaining species.

Finally he warned that the sixth extinction was not caused by the Earth System Process themselves, but only by the human beings, and that, due to the fact that the rate of extinction is about four orders of magnitude greater than the rate in the K-T transition, the next hundred years are crucial to the evolution of life on the Planet.

The Earth System Complexity, Simulation and Prediction Presenter: Geoffrey Boulton

Boulton pointed out the relevance of time and space scales in the development of the necessary conditions for life to appear. Among the essential pre-requisites he mentioned the need for liquid water and stabilization of temperature at the surface, underlining the role of the Atmosphere in this field.

Referring to Palaeoclimatology, he addressed the enormous amount of data about past atmospheres, that is hidden in the ice of the polar caps.

He used a sound expression, "we must not underestimate the capacity of Nature for surprising us" to illustrate that the state of knowledge in many fields of Earth System Processes is still poor and does not allow scientists to make accurate predictions on the effects of human-imposed changes on the system.

Tuesday 26th

The Geological Consequences of Evolution Presenter: Andrew H. Knoll

Knoll open his presentation projecting a facsimile of Hutton's "System of the Earth, its evolution and Stability", and referred to his pioneering work when he asked himself about how the earth worked, and how much longer it could remain suitable for human habitation.

He pointed that the environment is not static, and that conditions that make it suitable for the different forms of life are the result of complex interrelationships, that were modified by the number and diversity of life forms present. He referred also to the evolution of the atmosphere and the modifications and interactions it had (and still has) with life forms

Wednesday 27th

Earth History from the Perspective of a Geodynamicist Presenter: Michael Gurnis

The presenter focused on the dynamics and history of the Earth's mantle and how it influenced the evolution of the crust and atmosphere. He pointed out the relevance of crustal rocks in reconstructing the history of the mantle and illustrated his presentation with many tomographic images, underlining that the scientific community is just beginning to agree about the structure and dynamics of the most important (for its mass and volume) part of the Earth, concluding that both the surface and interior of the planet are strongly linked and that knowledge about the evolution of each should result in knowledge about evolution of the other.

Thursday 28th

Mineral Resources and Earth Processes Presenter: James M. Franklin

In a vivid presentation, Franklin pointed out the importance of understanding Earth System Processes in the search for natural resources. He said that minerals are, and will be necessary for continuous economic development, and, as a consequence, new methods and models must be developed in order to find ores that remain hidden under the surface. This is even more important when the fact that there are no longer technological restrictions to the excavation of ores beneath several tens of metres of rock is taken into account.

He referred to the fact that many of today's valuable commodities are metals that appear as impurities in cheaper ores like copper, lead, etc. Understanding how these minor components get incorporated into the major ore is crucial in its prospecting and is still subject to scientific research.

Friday 26th

Panel: Earth System Science Policy and Environmental Security: Role of International and National Agencies.

Representatives from different institutions and agencies (UNESCO, NSF, ESF, NASA, NERC and GSA) made short presentations regarding their policies for future research and, some of them, also referred to budget assignments. It should be pointed out that only a few participants were present other than the speakers, and that many criticisms had been directed to the scientific policies (present and future). Among them is the fact that the backing of only a few big projects is not good for the advancement of science.

GENERAL SESSIONS:

Although, as stated before, presentations should have focused on broad scale Earth Sciences Process, many missed the point and provided only partial and localized descriptions. Despite this (which can be explained by the lack of experience of this kind of "summarizing" meeting), most presentations showed quality both in the research methods involved and in the conclusions presented, giving birth to fruitful discussions.

Panel sessions, fuelled by a crowded and active beer bar, was the place where old friends met and new scientific relationships become established.

Session 35 - Public Communication of Environmental Issues and Hazards

This was the session devoted to communication and educational subjects. Most presentations referred to the role of public agencies in the prevention and mitigation of natural hazards. Different experiences, involving different practices were presented, all of them pointing to the fact that there is still a lot to be learned about how to communicate environmental issues and hazards without producing negative effects on the population.

One of the posters in this session, referring to the fact that many monsters like the Loch Ness Monster are associated with fault zones, was taken by the newspapers, showing what journalists actually look for when they speak about science.

Dr. Jose Selles-Mart'nez Director Departamento de Ciencias Geologicas Facultad de Ciencias Exactas y Naturales, UBA pepe@gl.fcen.uba.ar

ANNOUNCEMENTS:

UniServe Science produces an international newsletter on the use of IT in Science teaching in Universities called CAL-laborate. As the name suggests, it is a collaborative project between the Learning and Teaching Support Network (LTSN) in UK, Council for Renewal of Higher Education

in Sweden and UniServe Science in Australia. It is published twice a year, one issue being the physical sciences including in the last issue (October, 2000) two articles on the geosciences which may be of interest to the members of the IGEO list.

These are: "Pollen Image Management: Using Digital Images to Teach Recognition Skills and Build Reference Collections" Peter Shimeld, Feli Hopf and Stuart Pearson, The University of Newcastle "UKESCC Earth Science Courseware Goes on the Web" W. T. C. Sowerbutts, University of Manchester Both papers are available on-line from our web site at <http://science.uniserve.edu.au/pubs/callab/vol5/>

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COUNTRY REPORTS:

ARGENTINA:

The Argentine representative in IGEO, Jos  Sell s-Mart nez, has been re-elected as Director of the Department of Geological Sciences at the Universidad de Buenos Aires. This means two years more of "community service" and less science and research. God bless him!

Following the great success of the workshop two years ago, Geosciences Education has got its own session in the next Argentine Geological Congress, to be held in El Calafate in April 2002. All those who dream of visiting the Patagonian Ice fields, now have the right excuse to do so. Just visit the Congress web page at <http://www.cenpat.edu.ar/xvcega>.

The Earth Sciences Week will be celebrated at the Universidad de Buenos Aires with a great exhibition (including life-size dinosaurs), a big model of the Aconcagua Mountain, analogous and mathematical modeling, public conferences, guided tours through the Department of Geological Sciences, etc., etc., etc. During the closing ceremony prizes will be given to the winners of a competition for 9 - 11 and 12 - 14 year old students. The competition is organized by Aulagea, the program for education and outreach of the Department of Geological Sciences and the Department of Atmospheric and Oceanic Sciences and devoted to the Hydrological Cycle. The guys had to explain how the Hydrological Cycle worked in their own communities. Everybody on the staff expects to be exhausted for the whole of the following week!

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CANADA

Canadian Geoscience Education Network (CGEN)

Canadian Geoscience Education Network (CGEN) is a loose-knit group of educators, scientists, and other professionals whose objective is to advance earth science education in Canada. Established in 1993, CGEN is the educational arm of the Canadian Geoscience Council. Its mandate and objectives are to:

1. encourage public awareness of geoscience activities;
2. coordinate efforts of the Canadian earth science community in matters related to geoscience education and public awareness of geoscience;
3. act as a forum for discussion of geoscience education in Canada;
4. initiate coordinated activities related to geoscience education; and
5. liaise with similar bodies in other countries

CGEN can best advance geoscience education in Canada by capitalizing on current, high-profile success stories. To this end, CGEN is promoting four projects over the next few years as the core of a national geoscience educational program (Geoliteracy Canada):

EarthNet (<http://agc.bio.ns.ca/EarthNet>), a virtual centre of earth science resource information and contacts for teachers, home educators and students at the elementary, junior, and senior secondary school levels

EdGEO (<http://www.edgeo.org>), which supports local earth science workshops for Canadian teachers

Geoscape Canada (<http://geoscape.org>), which produces posters and websites that communicate practical earth science information to communities across Canada; and

GeoSciEd IV (<http://www.science.uwaterloo.ca/earth/geoscied>), the Fourth International Conference of the International Geoscience Education Organization (IGEO), which will be held in Calgary in August 2003.

CGEN also wishes to champion and support local and regional geoscience education programs, such as those of CGC and some of its member societies, provincial and other museums, mining associations, the Atlantic Geoscience Society, the Geological Survey of Canada, volunteer groups such as the Calgary Science Network, and others.

CGEN would like to draw Canadian geoscientists into these programs. It is undertaking fundraising for Geoscape projects, EarthNet and an updated brochure on careers in earth science. CGEN's vision is a greatly expanded delivery of Geoscape Canada, EarthNet, and EdGEO. Our hope is that you will get involved in one or more of these programs. If you would like additional information or wish to be placed on CGEN's e-mail distribution list, please phone me or send me an e-mail message.

John J. Clague President, CGEN Phone: 604-291-4924 jclague@sfu.ca

SOUTH AFRICA

WORKSHOP ON TERTIARY SECTOR GEOLOGY EDUCATION

Maputo, 20 - 24 November 2000

INTRODUCTION: A meeting of interested parties was held at the Eduardo Mondlane University in order to discuss the future of Geoscience education in the southern African countries (SADC). The focus of the meeting was to examine issues related to regional co-operation and capacity building in the field of Earth Science education. University representatives from Angola, Botswana, Kenya, Malawi, Mauritius, Mocambique, South Africa (Universities of Cape Town, Natal and Witwatersrand), Tanzania, Zambia and Zimbabwe presented papers on the status of Earth Science Education in their particular regions in order to set the scene for work-shopping the requirements for sustainable development in Earth Science Education through integrated co-operation between universities in the region. Prof. Morris Viljoen and Dr. Gillian Drennan represented the Geology Department and the College of Science Earth Sciences at the meeting.

What became very apparent during the presentation of papers was the large number, and variety, of post-graduate courses (MSc/MPhil and PhD) offered throughout the region. In order to support these post-graduate programmes there has been a considerable amount of "curriculum development" at undergraduate levels in many institutions. Despite this, though, all universities expressed similar concerns such as: declining student numbers, under-preparedness of students at undergraduate levels, declining funding and associated restrictions on research.

PAPERS OF PARTICULAR INTEREST: Poster and oral contributions were well presented and provided a platform from which to work in order to examine the possibilities of integrated co-operation between universities in the region. Of particular note was a presentation from the University of Zimbabwe, in which "The Mineral Resources Centre (MRC)" was introduced. This paper outlined how the Geology Department has become a profit centre by aggressively marketing itself as a commercial service provider. They offer geo-information and photographic services, customized training programs, access to a rock cutting laboratory as well as analytical laboratory facilities to the mining and related industries at highly competitive prices. Another interesting contribution from the same university highlighted the need for academics to examine closely what it is that they wish to assess in examinations and to consider the manner in which they pose examination questions.

Natal University highlighted their "outreach programme" - particularly their glossy brochure and poster outlining the geology of Natal (also available on the web) - and their public lecture series. University of Cape Town presented astounding statistics regarding the entry level of first-year students (using the PTEEP test developed by the Geology and Applied Languages Departments at UCT), highlighting the need for academics to continuously stress the "big picture" of Earth Sciences as well as the "scientific" nature of the discipline in rigorous lectures, so as to overcome student perceptions that Earth Science is an "everyday" thing that requires no (or very little)

studying because it is not "real science". UCT has also outlined a school's outreach programme that introduces scholars and teachers to Geology through school visits (by geology students and post-graduates) as well as an annual, student-run field trip to the Laingsburg area for school children and a staff-run field trip for teachers. Eduardo Mondlane University (UEM) also introduces the science of Geology to schools through student visits and the student publication "Geo rnal". Another of their presentations highlighted the role of fieldwork in studying geology and the advantages of making "true scale observations".

The University of Mauritius outlined the need for embracing "hi-tech" geology through a presentation on applications of GIS to Earth Sciences. The University of Zambia stressed the need for developing an Earth Sciences-related database and highlighted the Masters Degree in Small Scale Mining" offered by their institution - something that could be of importance to South Africa in the near future if/when the new proposed Mineral Rights Bill comes into operation. The Universidade Agostinho Neto (Angola) and UEM demonstrated the need for change in Geology curricula and suggested new curricula that would address the needs of academia, industry and the environment.

Professor Morris Viljoen of the University of the Witwatersrand presented 2 papers at the meeting: "Tertiary Geoscience Education for the Mineral's Industry at Wits University", and "The Teaching of Environmental Geoscience at Tertiary Level". In his presentations he outlined how changes in the mining industry over the last decade have brought about changes in courses offered at tertiary level, particularly in applied geoscience topics. He highlighted some of the courses offered at WITS: the honours degree in mining geology (Geology and Mining Engineering Departments), a geology honours degree which includes a range of applied topics for the minerals industry (Geology Department), and a Graduate Diploma/MSc in the Department of Mining Engineering. He stressed the need to develop courses at introductory levels as well as at higher post-graduate levels that are taught in conjunction with other related and relevant environmental science topics (e.g. the Post Graduate Diploma and MSc in Environmental Science by course-work plus a research report).

Dr. Gillian Drennan of the University of the Witwatersrand presented a paper entitled "Innovation in Earth Science Education at the University of the Witwatersrand". She outlined recent developments in the Department of Geology which contribute towards providing well-trained graduates that contribute towards their employers' needs and that serve the needs of society by redressing the racial imbalances among science graduates caused by past educational inequalities. She highlighted the wide variety of undergraduate and honours courses on offer in the Department of Geology (and other associated Earth Science, Life Science and Mining departments). She also introduced the College of Science Earth Sciences programme for academically disadvantaged students as well as the new development from within the College - the Open Learning/Distance Education programme for students that cannot be a part of the face-to-face College course. She highlighted the fact that all materials developed were locally applicable and "Afro-centric".

Universiteit Utrecht (Netherlands) - one of the co-sponsors of the workshop - outlined the need for an interdisciplinary, as well as an inter-faculty/inter-institutional, approach to teaching Earth Science (including Geography, Geology, Biology, Astronomy, etc. between faculties within any institution and between institutions). Inter-institutional co-operation in Holland has given rise to

inter-institutional research and the establishment of a "Super Research School" that boasts partnerships with outside institutions and a School of Geodynamics, the Netherlands Research Centre for Integrated Earth Sciences. This "Super Research School" involves the co-operation/collaboration of 3 universities and was presented as a possible model around which similar regional co-operation might be developed in southern Africa.

THE WORKSHOP Four groups were established to look at 4 different possible areas of co-operation in the SADC region. These groups looked at:

- Teacher Training and Outreach/Public Awareness,
- Information Exchange,
- Post-graduate/Research/Consultancy Exchange, and
- Under-graduate Programmes.

Teacher Training and Outreach/Public Awareness: This group shared in detail what was known to be on offer at various universities in the region and internationally and agreed that without public awareness it was very difficult to promote our science. UCT and UEM have outreach programmes that involve Geology under- and post-graduates visiting local schools, giving general-interest talks to scholars and teachers, promoting awareness of Earth Sciences. UCT takes this outreach one step further by having geology students organize, raise funds for, and run an annual field trip for 40 scholars to the Laingsburg area, where they are introduced to the "fun-'n-games" of Geology. Very often these scholars end up registering at UCT in order to study Geology!!! Other universities had lecturers visiting "feeder schools", organized school visits to departmental museums, and Open Days. Public lecture series were also seen to contribute towards increasing awareness. Without exception, all group representatives felt that it was imperative to promote Earth Sciences to General Science School Teachers as well as to the General Public if we want to attract students into our discipline, but representatives recognized that time and funding for such programmes was sometimes difficult to come by. One possible source of funding is "AGID".

Possible avenues of collaboration established in this group included:

- Univ. of Natal and UEM - upgrading the pamphlet on the Geology of Natal to cover the Geology of Mozambique (as much of the geology is very similar), and translating it in to Portuguese
- WITS and UEM - continuing collaboration on teaching 3-D geological concepts
- Possible "Internet" collaboration such as GEOTEACH (UCT)

Information Exchange: Participants in this group felt that a WEB-SITE and/or SPREADSHEET was necessary to facilitate information exchange and that e-mail was probably the place to start. It was suggested that data pertaining to each university in the region be supplied related to:

- Education: Course types offered, Admission requirements, Topics, Target groups, etc.

- Research: Available projects, Supervision, Funding, etc.
- Admin. Structure: Budget allocation, Associations, Departments, Centres, etc.
- Staff: Staff details at each academic level,
- Students: Numbers for BSc (General) and Honours
- Timetable: What is on offer throughout the academic year
- Laboratory facilities and equipment:

This group felt that if this information was made available on a single web-site there could be greater collaboration between staff and students, and less duplication of unnecessary paper-based exchanges. They undertook to look into the creation of such a web-site and ALL participating universities were asked to forward such data to the group.

Post-graduate/Research/Consultancy Exchange: This group established all the MSc/MPhil and PhD programmes currently on offer throughout the region. They recommended that, in order to facilitate post-graduate exchange, all programmes should be "modularized" and that "regional courses" be developed. They felt that focus areas should include:

- Hydrogeology (e.g. Kenya, Botswana, Bloemfontein)
- Exploration Geology (e.g. Zimbabwe, Rhodes)
- Mining and the Environment (e.g. WITS)
- Small Scale Mining (e.g. Zambia) - Petroleum geology (e.g. Angola)
- Water Resource Management (e.g. Dar Es Salaam, Zimbabwe)
- Engineering geology (e.g. Natal)
- Geoinformatics (e.g. Zimbabwe, Rhodes, Fort Hare).

The group recommended that universities work towards recognition of each others degrees and accept credits between institutions for modular courses. They further recommended that financing (in the form of scholarships, AAD, Nuffic - MHO, UNESCO, ANSTI/ROSTA, and various mining houses) be sought to support student and staff exchange.

Under-graduate Programmes: This group focussed on BSc and BSc(Hons) programmes offered at universities in the region. They recommended that an inventory be established outlining what is currently being offered and that a "model make-up" be determined outlining:

- Entry level standards, - Exit level requirements, - Standards, - Field trip programme: norm; guides, uniform questions based on trips, etc., and - Quality control: external examiners.

The group felt that exchanges of "geo-info", samples and staff (e.g. TWA, sabbatical leave) were more feasible than exchange of students, but did not rule this out all together. They further

expresses the need to standardize assessment (external examiners and cross-border field work) as well as thesis presentation style (for Honours students).

OUTCOMES: After discussions the representatives from participating countries agreed on the creation of a programme of "Regional Co-operation and Capacity Building" centred on the following objectives (taken from the Letter of Intent produced at the meeting):

1. Optimization of the human, financial and equipment resource base to promote teaching in Earth Sciences in the region.
2. Development of regional capacity building in Earth Science through exchange of staff and students, and the creation of Centres of Excellence.
3. Develop distance education programmes with relevance to the region.
4. Promote public awareness of Earth Science Education
5. Stimulate co-operative high-quality research and undertake efforts to obtain funding for such research.
6. Create an environment for sustainable development of Earth Science Education in the region.

FIELD EXCURSION: Between the presentation of papers and posters and the workshopping of ideas on collaboration, staff and students of UEM arranged a one day field excursion for participants. This trip exposed visitors to outcrops in the Maputo Province. We visited spectacular volcanic exposures (Karoo intrusions and rhyolites) of the Lebombo Formation, post-Karoo intrusive bodies and some sedimentary formations (Meso-Cenozoic continental and coastal depositional environments).

We visited the Pessene Nepheline Syenite that exhibits a porphyro-phaneritic texture with phenocrysts of nefeline up to 3 cm in length. This intrusion is supposed to be a Mesozoic alkaline intrusion. Spectacularly deformed rhyolite flows were visible in road-cuttings along the new Matola-Moamba road and these have been cross-cut by younger dolerite dykes. The presence of a bentonite quarry along the Boane-Namaacha road suggests that a locally developed volcanic tuff underwent hydrothermal alteration. Gradational cycles of arkosic sandstones and conglomerates are well exposed near the railway bridge over the Umbeluzi River, and indicate braided river deposits. We also saw the aftermath of the flooding that occurred in early 2000 where an entire village, Costa Do Sol, almost disappeared under Pleistocene dune sand that was washed down from the higher dune-field onto the coastal plain, and even reached the current beach. A very interesting day was topped by a visit to Aldeia Dos Pescadores (Fisherman's Village) in Maputo Bay where the influence of the Inhaca and Xefina Barrier Islands can be seen on the local coastal system. We could see the tidal channel and backbarrier settings and saw the onset of mangrove swamp development.

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UNITED KINGDOM:

Geoscience for UK Science Teachers

Most of the Geoscience in the National Curriculum of England and Wales is included in the science curriculum, and so the Geoscience is largely being taught by specialist teachers of biology, chemistry or physics who have little or no geoscience in their own education backgrounds. As a result, the geoscience is often taught in uninspired ways.

Thus a 'Joint Initiative' has been launched in the UK involving the Institute of Physics (IoP), The Royal Society of Chemistry (RSC), the Institute of Biology (IoB) and the Earth Science Teachers' Association (ESTA) with sponsorship from the UK oil industry, (UKOOA). The initiative has the aim of 'the motivation of science teachers and the encouragement of enthusiastic approaches to the teaching of the Earth science component (a quote from the remit). The IoP, RSC and IoB have each formed separate subject-specific working groups to prepare materials including: ideas for demonstrations and activities; revision worksheets; a pack of 'stories' for 11 - 14 year olds; supplementary material and suggested further reading for teachers; a give-away leaflet with 'amazing Earth facts' for students and web-based versions of some of these materials. The materials will be presented in ways that science teachers will find easy to follow and to use. A progress report on the initiative will be presented at the Association for Science Education national conference in Liverpool in January, 2002, and the final outcome at the ASE conference in the following January, 2003.

Forthcoming Conferences

ESTA (Earth Science Teachers Association) Annual Conference, Friday September 7th- Sunday, September 9th, 2001, at Kingston University near London. Do come and join us for the primary (5 - 11), secondary (11 - 16), post-16 (16 - 18) and Higher Education (post 18) Continuing Professional Development (CPD or INSET) day on the Friday or for the full Conference from Friday evening to Sunday lunchtime.

Participants from overseas would be most welcome. We may be able to organize visits to schools for you in the days following the Conference. If you are interested in extending a visit in this way, please contact c.j.h.king@educ.keele.ac.uk. More information can be found from the ESTA website, www.esta-uk.org

ASE (Association for Science Education) National Conference, Thursday 3rd, January - Saturday 5th, January, 2002, at Liverpool University in north west England. This is the major science education conference in the country, attracting some 3000 science teachers and educators. An Earth Science Theme Day is planned for Thursday 3rd, January, involving workshops (for teachers of 5 - 11 and 11 - 16 year olds) and lectures. Joint Earth Science Education Initiative presentations will take place on Friday 4th, from the organizations representing biologists (IoB), chemists (RSC) and physicists (IoP). More details can be found from the ASE website, www.ase.org.uk

The Earth Science Education Unit

The Earth Science Education Unit (ESEU), administered from Keele University, was set up in 1999 with funding from the UK Offshore Operators Association (UKOOA) to run a two year pilot project providing free Continuing Professional Development (CPD or INSET) workshops to secondary science teachers (teachers of 11 - 16 year old pupils). The workshops were offered to science departments in all secondary schools in three pilot areas and to groups of teachers meeting elsewhere in the country. The only payment required was for traveling expenses and photocopying costs.

The pilot has been very successful, thus a further bid has been submitted to UKOOA for funding for five years. If successful, this would increase the regional coverage of the United Kingdom year by year until workshops were available in all parts of the UK including Scotland, Wales and Northern Ireland. The five year plan envisages workshops being offered by trained 'volunteers'. The focus of the workshops, as for the current workshop programme, would be to help teachers to develop their understanding of the Earth science content of the National Curriculum for Science in ways that motivate and enthuse them. ESEU workshops explain Earth science in simple, jargon-free language, they highlight the relevance of Earth science understanding to the processes going on outside the window, they focus on the relevance of these processes to everyday life, and they use a range of practical and investigative approaches that can engage and interest pupils. They seek to provide teachers with all they need to take the ideas 'off the shelf' and use them in teaching the following day. If the bid is successful you will read more about this ESEU initiative in future editions of this newsletter.

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