



Newsletter

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Super Sedimentological Exposures

Southern Ticino, Switzerland : Geological archive of the evolution of the Mesozoic alpine Tethys Ocean

Introduction

The localities Arzo and Breggia can be regarded as “classical” geological archives of the tectonic and oceanographic evolution of the alpine Tethys Ocean. In addition, Arzo is located at the foot of the 1,097 metres high Monte San Giorgio built up of a Middle to Late Triassic shallow-water carbonate succession. The Middle Triassic Grenzbitumenzone, outcropping along the Mte San Giorgio has become famous for its rich and unique fish and reptile fauna. Today Monte San Giorgio is a UNESCO World Heritage Site.

A short geological history

About 280 million years ago, the supercontinent Pangea was cut by numerous transtensional graben structures, which can be recognized from the Ural Mountains through Europe into the Appalachians. These graben structures were filled with continental deposits during the Permian and the early Triassic. Clastic sediments of Permo-Triassic age form the oldest sedimentary rocks of the Monte San Giorgio mountain. The early extensional tectonics was accompanied by volcanic activity. In the Southern Ticino region, volcanic (andesites,

rhyolites) and volcanoclastic rocks are outcropping near the city of Lugano.

The Late Permian and Early Triassic red clastic sediments are overlain by middle and late Triassic dolomites, limestones and marlstones which were deposited in a shallow marginal sea of the opening alpine Tethys Ocean. The Monte San Salvatore along the Lago di Lugano is built up of a middle Triassic dolomite sequence which was formed in a current influenced shallow platform environment. The middle Triassic sediments outcropping today on the nearby Mte San Giorgio were deposited in an isolated shallow marine basin. Due to restricted water circulation, laminated claystones, marlstones and dolomites were sedimented under low oxygen and anoxic conditions (Fig. 1). These sediments, known as “Grenzbitumenzone”, contain up to 40% organic carbon. This horizon contains a rich fauna of vertebrates with abundant reptiles and fish. A thick succession of dolomites and limestones was formed under Sabkha-type conditions during the Late Triassic (Dolomia Principale, Calcare di Zu).

Starting with the Early Jurassic the alpine Tethys Ocean was affected by accelerated rifting. This resulted in the development of several listric normal faults. One of these faults, the Lugano fault, separated a rapidly subsiding

basin (Generoso Basin) to the east of the fault from a submarine high forming the footwall of this fault (Lugano high). Today, the signature of this rifting tectonic activity along the Lugano fault is contained in Triassic-Liassic sedimentary rocks of the submarine high (Locality Arzo) and in the basin infill sediments of the evolving Generoso Basin (Locality Gole della Breggia).

Tectono-sedimentary breccias were formed along the margin of the evolving submarine high. These breccias are overlain by a condensed succession of Early Jurassic red marine limestones, recording a progressive deepening of the submarine high. The evolving Generoso Basin east of the submarine high, was filled by up to several thousands of meters of turbiditic siliceous limestones. A distinct change in basin infill history occurred during the late Liassic. The turbidite succession was replaced by pelagic sediments of middle Jurassic to middle Cretaceous age. Today this pelagic succession is preserved in the Breggia section. Red limestones rich in

ammonites (Rosso ammonitico) formed during the Toarcian and are overlain by pelagic lamellibranch limestones, radiolarian cherts and limestones of middle to late Jurassic age and by white nannofossil limestones which are of early Cretaceous age. These pelagic sediments provide a unique and continuous record Jurassic-Cretaceous alpine Tethyan oceanography. The facies of the middle-Jurassic-Late Cretaceous pelagic sediments was controlled by the basin topography, by water depth (calcite compensation depth) and by physical and chemical oceanography.

The most prominent Early Cretaceous black shale episode known as Oceanic Anoxic event 1a (Livello Selli) is missing at the Breggia locality. Other black shales of Barremian and Albian-Cenomanian age document the peculiar conditions in Cretaceous oceans resulting in a widespread and often global deposition of sediments enriched in organic carbon. The Late Cretaceous black shales are intercalated with red, green and white limestones, marlstones and claystones of

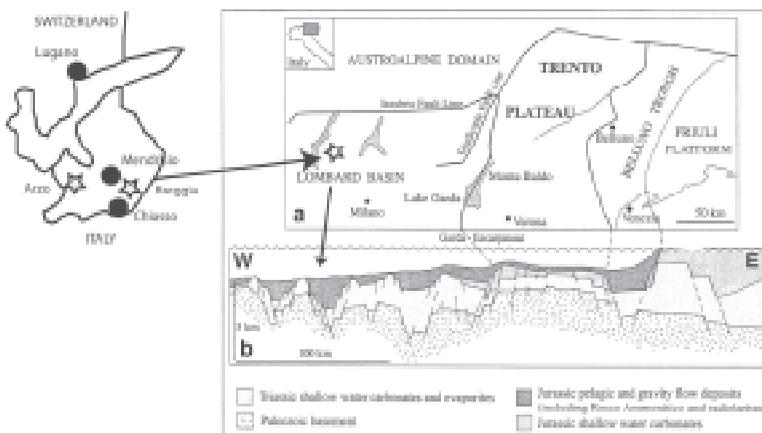


Fig. 1- Geographic location of the localities and paleogeography of the southern continental margin in the Jurassic (After Bernoulli et al., 1979)

the Scaglia Variegata, Scaglia Bianca and Scaglia Rossa. These sediments deposited during middle and Late Cretaceous reflect changing tectonic and oceanographic conditions in a slowly closing alpine Tethys Ocean. A succession of turbiditic sandstone was formed during the Late Cretaceous and it is interpreted as the first flysch succession in the western Southern Alps.

Description of stops

Locality 1: Arzo quarry

Theme: Fractured Late Triassic carbonate platform with polyphase breccias, so called “Neptunian Dykes” - Opening of Mesozoic Tethys Ocean.

How to reach the stop: By train/car from Zürich/Lugano or from Milano/Chiasso to Mendrisio. Postbus/car Mendrisio-Arzo, 15 min walk along the road to Meride. Arzo quarries are at the left side of the road.

Explanation: Tectonic activity along the opening alpine Tethys Ocean was intensified in the Late Triassic and Early Jurassic. A record of the tectonic activity along a newly developing continental margin is preserved in several small quarries near the village Arzo. There, shallow-water carbonates (limestones and dolomites of the Norian Hauptdolomite Formation and the

Rhetian successions) are overlain by red bioclastic limestones with crinoids and brachiopods (Broccatelli Formation) and by red ammonite-bearing limestones (Besazio Limestone. Early Jurassic). In places, the Triassic limestones and dolomites are cut by syndimentary faults and graben structures of up to several meters in width in which are classified as Neptunian Dykes. The graben structures and fractures were filled with syndimentary polyphase breccias. Polyphase fragmentation of the Triassic platform carbonates resulted in breccias with multiple generations of clast and matrix formation (Foto 1). These breccias are known as Macchia Vecchia.

On a larger, regional scale, the fragmentation of the evolving Mesozoic southern continental margin of the alpine Tethys resulted in listric fault structures separating submarine highs from continental margin basins (Fig. 2).

Locality 2: Parco delle Gole di Breggia

Theme: A Mesozoic paleoceanography of the Tethys Ocean.

How to reach the stop: By train/car from Chiasso/Mendrisio to Balerna. From Balerna train station, 15 min walk through the village to the Parco delle Gole di Breggia.

The path through the Park begins by the side of a small lake and continues along the river to the old cement factory and along the river to Morbio Superiore.

Explanation: The section in the Gole della Breggia or Breggia Gorge is best studied starting at the upper end (locality Morbio superiore). A well-prepared path in the park allows one to follow the Liassic-Cretaceous section along the Breggia gorge walking upward through time.



Foto 1.- Arzo-Breccia, polyphase brecciation

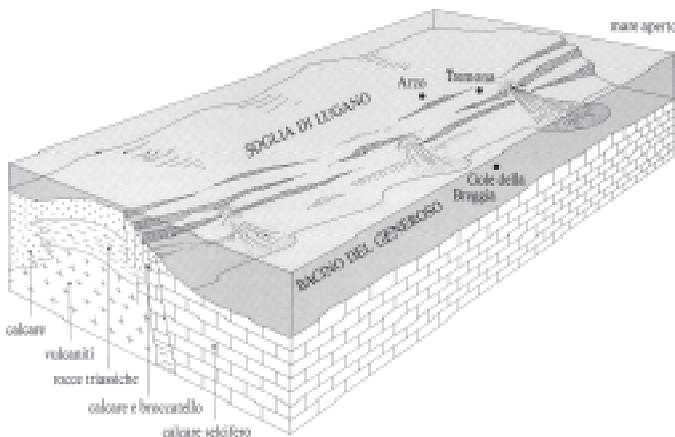


Fig. 2.- Paleographic position of the two localities (modified from Cotti et al. 1990)

Up to several thousands of meters of turbiditic limestones, which were deposited in the rapidly subsiding early Jurassic Generoso Basin, are today forming the Monte Generoso to the northeast of the gorge. Along the excursion path only the uppermost meters of this sections can be studied. Grey, siliceous limestones with rare evidence of turbidity current deposition are alternating with silty marls (*Moltrasio Formation*).

A dramatic change in the depositional environment occurred during the Late Liassic, when turbidite sedimentation was stopped and red pelagic carbonates of the *Rosso Ammonitico Formation* (Toarcian) were accumulated. The Ammonitico Rosso limestones do not outcrop along the path. They can only be visited at the river. There, the Rosso Ammonitico succession shows a prominent cyclicity pattern. These cycles record oceanographic changes controlled by changes in orbital parameters (20ky cycles according to Weedon, 1989).

Rosso Ammonitico limestones are overlain by a succession of red

Limestones with pelagic bivalves (Bathonian-Bajocian). One large, up to 10m thick slump (Foto 2) and several small slump deposits within these limestones document how pelagic sedimentation in the Generoso Basin was also controlled by local basin morphology. The slump deposits can be seen from the path crossing the valley high above the river.

The red pelagic limestones are overlain by green and red *radiolarian cherts* of middle to Late Jurassic age. The radiolarites form the steepest part of the gorge. Radiolarites were deposited below the middle to Late Jurassic calcite



Foto 2.- Slump deposit, middle Jurassic, Breggia Gorge



Foto 3.- The late Jurassic-Early Cretaceous part of the Breggia section.

compensation depth (CCD). A peculiar oceanography with highly productive surface waters favouring the bloom of radiolarians and good ventilation of deep water favoured the formation of the red radiolarian cherts. The radiolarian cherts are overlain by radiolarian limestones of Oxfordian-Tithonian age. The transition to radiolarian limestones (Oxfordian) marks a progressive deepening of the Late Jurassic CCD and a change in Tethyan Oceanography.

Most prominent is the following change in pelagic sedimentation at the transition from the Jurassic to the Cretaceous (Foto 3). *White nannofossil limestones* outcropping in the old quarry at the base of the gorge were deposited during the Berriasian to Barremian (*Maiolica Formation*). Several slump deposits are intercalated with the well-bedded limestones. In the uppermost part of the up to 140 m thick white limestone formation we can recognize black shale intercalations. These black shales were formed under dysoxic or anoxic conditions during the Barremian. The top of the Maiolica Formation is marked by a hardground containing glauconite. The hardground was formed during Late Barremian and Early Aptian. Due to this stratigraphic hiatus spanning the Late Barremian and early Aptian, the black shale deposits formed during OAE1a (Livello Selli) are not found in the

Breggia section. From Late Aptian to Cenomanian hemipelagic marls and limestones of the Scaglia group were deposited. A significant increase in clay content coincides with beginning of convergence tectonics in this part of the alpine Tethys Ocean. Flysch sedimentation started during the Late Cenomanian. These flysch deposits can be studied at the very end of the Breggia gorge section.

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Guide books

Rudolf Stockar, 2003. Parco delle Gole della Breggia, Guida Geologica, Museo cantonale di storia naturale, CH-6900 Lugano.

IAS Meeting of Sedimentology, 2001, Davos, Switzerland, Excursion guides (a few copies are still available from the author of this article)

General Information

Tourist Web site:

<http://www.mendrisiotourism.ch>

Web address UNESCO Site:

http://whc.unesco.org/pg.cfm?cid=31&id_site=1090

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REPORT ON

The Polish Sedimentological Conference

The Polish Sedimentological Conference “Geology of the Tatras – over-regional sedimentological context” was held in Zakopane (southern Poland) from 21st to 24th of June, 2004. The main organizer was the Polish Geological Society. Institute of Geological Sciences of Jagiellonian University (Kraków), Department of Geology and Palaeontology of Comenius University (Bratislava), and the Tatra National Park were the co-organizers. The conference took place thanks to the cooperation between Polish and Slovakian sedimentologists. This scientific event has been the continuation of The National Meetings of Sedimentologists which were organized annually by the Sedimentological Section of the Polish Geological Society from 1992 to 1998.

The conference was attended by more than 80 participants from different Polish scientific centres, a group of sedimentologists from Bratislava and a few geologists from Germany, The Netherlands and China. The conference was financially supported by the Polish State Committee of Scientific Research and the International Visegrad Fund. The scientific documentation delivered to the conference attendants comprised 133 pages all together. They included field session guidebooks and abstracts of papers and posters. The guidebook of field sessions was published in Polish with English summaries.

Five field sessions were organized during the conference. Four of them concerned carbonate sedimentation on the northern passive shelves. Problems dealing with the evolution of the Triassic carbonate environments in the light of recent results from sedimentological, geochemical and palynological research were discussed. Three field sessions were dedicated to this topic. The fourth field session concerned the sedimentation of Jurassic and Cretaceous deposits. The sedimentation of Lower-Middle Jurassic deposits which took place during the tectonic disintegration of Tethyan shelves was presented. The problem of depositional rates of Upper Jurassic-Lower Cretaceous basinal deposits was discussed as well. The fifth field-session was mainly focused on the sedimentation of Tertiary marine sediments, predominantly of flysch type. Sedimentologists from Kraków, Bratislava, Halle and Warszawa were the field-sessions leaders.

There were delivered 36 papers and 17 posters were presented. Several papers concerned sedimentation of rocks in the Central Carpathian, mainly Tatric region (12 papers). The subject of the other papers was sedimentation and diagenesis of carbonate deposits (9 papers), sedimentation of fossil (11 papers) and modern clastics (4 papers).



Conference participants

The discussions which took place during the conference enabled the participants to exchange ideas and views. It also contributed to strengthening integration within Polish sedimentologists as well as between Polish and Slovakian sedimentologists. The participants decided that Polish Sedimentological Conferences would be organized every second year. The next conference will take place in Roztocze (eastern Poland) in spring 2006. It will be organized by sedimentologists from The Polish Geological Institute and The Warsaw University.

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REPORT ON

Travertine Course 2004

*(Tectonic and Climatic Controls of Travertine Formation.
The Case of the Pannonian Basin)*

an IAS sponsored postgraduate field course
Tata-Egerszalók/Hungary 04-09 July 2004

The main goal of the course was to foster travertine research by bringing together young scientists and outstanding experts in a place where travertine sedimentology and the major controls of travertine formation could be discussed not only in the lecture hall but also in the field. Hungary with its abundant Pleistocene and recent hot-water and ambient-water travertines and their associated actual and paleo hydrogeological phenomena was selected as an appropriate environment for the above planned discussions.

Problems addressed by the experts in their „keynote” lectures were:

travertine facies and their paleoenvironmental implications; hydrological and hydrogeological aspects of non-marine carbonate depositional systems; the role of microbial activity in travertine formation; the use of isotope geochemical and micropetrographical methods in travertine research; and finally also the use of travertines as building- and ornamental stones was briefly discussed.

40 participants (postgraduate and graduate students, postdoctoral fellows and university professors, speakers and field-guides and organizers included) arrived from 9 countries (Czech Republik, Croatia, France, Hungary, Italy, Kenya, Poland, Slovenia and Turkey) to the course, all of them enthusiastic about the subject.

Invited speakers were

B.D'Argenio and V.Ferreri from Naples/Italy ,

V.P.Wright from Cardiff/U.K. ,

A. Pentecost from London/U.K;

A. Demény, A.Török and A.Mindszenty from Budapest/Hungary

B.D'Argenio speaking about the geometries and behaviour of Central and Southern Italian travertine buildups, pointed out their striking similarity with the evolutionary trends of shallow marine carbonate platforms and emphasized the role of organismal templates in the formation of textures and sedimentary structures of travertines.V.

Ferreri gave a most concise and very well illustrated account on travertine textures. V. Paul Wright introduced the concept of the „continental carbonate continuum” pointing out that non-marine carbonates ranging from groundwater calcretes through travertines, palustrine and lacustrine carbonates are best understood by looking at the whole hydrological system behind. Allan Pentecost in his review on lower plants and travertines discussed the mechanism of calcification and the manifold biological feedbacks of travertine depositing systems. A. Demény compared the benefits and the caveats of isotope geochemistry applied to travertine research. A. Mindszenty illustrated the potential of micropetrography in the reconstruction of various travertine-depositing subenvironments. Á. Török’s lecture underlined the “applied” aspects of travertine research by giving a short summary on the strength and the resistance to weathering of cut travertine blocks on comparison with other limestone blocks used in the construction industry.

Details of the Program

The course consisted of one whole day of indoor program (invited lectures + a review of current research of the participants presented as posters and discussed collectively) and three full days outdoor (visiting and discussing Pleistocene to Recent ambient-water and hot-water travertines of Hungary). In addition, at the beginning, before the Welcome Party we had an afternoon tour at the Geological Park of Tata where Janos Haas introduced the participants to the geology of Mesozoic Formations in the Transdanubian Central Range, and at the end, before the Closing Ceremony we had a final discussion at Egerszalok, summarizing the outcomes of the Course.

In all 13 posters were presented and jointly discussed. The posters were on display during the first two days. In the same room a petrographic microscope with the video set-up was available for thin section microscopy and since participants and lecturers were accommodated in the same hotel there was ample opportunity to continue the discussions informally also after the organized lectures.

The first day of the program was dedicated to the invited lectures and an organized discussion of the posters the participants brought to present their current projects. The other three days were spent at various field localities in the Transdanubian Central Range and in North Hungary discussing field relationships, textures, structures and biota of both hot-water and ambient-water travertines.

Sites visited in the Transdanubian Central Range were the Süttő and Budakalász travertine quarries exposing huge Pleistocene limestone accumulations in a topographic position which clearly shows their relationship to tectonics. Also we have seen Szemlőhegy-cave, one of the famous thermal-karst caves of Budapest which are considered as predecessors of the spring-caves of the recent hot-water springs along the river Danube. Here A. Eröss & J. Mádl-Szőnyi (Budapest) gave a presentation about the hydrogeology of the Buda Hills considered as the drive of both Pleistocene and recent spring activity and travertine precipitation taking place along a major tectonic line in the hearth of the capital of Hungary.

In North Hungary we have seen several ambient-water travertine localities of the cascade and rapid type and visited also the active thermal spring-cone of Egerszalok. At all these sites there were lively discussions regarding the role of lower plants and bacteria in controlling travertine formation. Microbial activity was particularly well illustrated at the hot-spring cone.

The outcomes of the Course were summarized at the Final Discussion at Egerszalok. There was a general agreement about travertine depositing systems being extremely complex and displaying an inherent irregularity. They are controlled principally by hydrodynamics with several (mainly biological) feedbacks. The effects of climate and tectonics are indirect inasmuch as they may change hydrology on the large scale. The importance of the hydrogeological drive behind travertine formations was emphasized by both lecturers and participants.

Miscellaneous: Most of the IAS support was used - as planned - to keep the registration fee low for the students. The rest had to be spent to cover the expenses related to the organization of the course. Particularly valuable was in the organizational work the contribution of Dr Kinga Hips, Zoltan Lantos (both from the Academy of Sciences) and Dr Orsolya Szatnó (Dept. of General and Historical Geology, Eötvös L. University).

The course was jointly organized by the Sub-committee on Sedimentology of the Hungarian Academy of Sciences with the „Erdélyi Mihály” School of Advanced Hydrogeology (=UNESCO-chair at Eötvös L. University) and received manifold financial and moral support from the following Institutions/Companies: Mecenatura Foundation of the Hungarian Ministry of Education; Hungarian National Commission of UNESCO; Hungarian Geological Institute; Hungarian Speleological Society; Bükk National Park; Reneszansz Rt Süttő; Kékkuti Ásványvíz Rt

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*Participants
in the
Travertine
Course 2004
following the
indoor
program*



ANNOUNCEMENT

The 8th International Conference on Fluvial Sedimentology

The International Conference on Fluvial Sedimentology, which is held every four years since 1977, seeks to stimulate the exchange of ideas among a community of scientists with common interests in rivers and their deposits, both modern and in the geological record. The International Conferences on Fluvial Sedimentology aim at providing state-of-the-art overviews of the full range of sedimentological research on fluvial systems. The Eighth edition of the Conference will be held at the Delft University of Technology, Delft, The Netherlands, from August 7-12, 2005, and continues this tradition. New elements are the focus on applications of quantitative sedimentology to fluvial hydrocarbon reservoirs and to fluvio-deltaic systems.

The scientific programme addresses topics such as: river dynamics and morphodynamic modelling, fluvial response to climate change, tectonic control and anthropogenic impact, river management, fluvial reservoir modelling: stochastic vs. deterministic, and forward stratigraphic modelling, just to name a few. A special session will be held on dynamic interactions between lowland rivers and the shelf-slope-basin floor system, and there is still space for additional special sessions.

Eight pre- and post-conference field trips will take you to Late Jurassic-Early Cretaceous fluvial-lacustrine rift deposits in the Cameros Basin, tide-influenced fluvial deposits in the Tertiary South Pyrenean Foreland Basin, Tertiary fluvial fan deposits in the Ebro Basin, all in Spain; the present-day Volga delta in Russia, the Lower Old Red Sandstone in southwest Wales, fluvial terrace development in the Allier Basin in France, and of course the Rhine and Meuse rivers in Germany and The Netherlands. Furthermore, there is a nice portfolio of one-day mid-conference trips to key fluvial features in The Netherlands. Please check the Conference website for more details: <http://www.8thfluvconf.tudelft.nl/>

We are proud to announce that fluvial sedimentology research in The Netherlands is alive and kickin', and that the Dutch Sedimentology community has decided to jointly organize the Conference. At present, fluvial sedimentology research is performed at the Quaternary Geology and Geomorphology Department of the Free University, Amsterdam, the Earth Sciences Department of the Utrecht University, and the Applied Earth Sciences Department of the Delft University of Technology. Following is a brief overview of the research activities.

Research of the Quaternary Geology and Geomorphology Department in Amsterdam focuses on fluvial catchment area studies, extending from the late Holocene (human impact) to the Pleistocene (climate and tectonic impacts) on a scale varying between tens of years to hundred thousands of years. Field studies are complemented with numerical modelling to derive the sensitivity of changing boundary conditions on processes of river sedimentation and pattern development. Reconstructions at the transition from the last glacial to the Holocene were carried out in the middle Maas valley (The Netherlands), the Warta river (Poland) and the Tisza river (Serbia). In recent years focus shifted to the information provided by geochemical indicators, model experiments and sedimentary budgets. For more on this: <http://www.geo.vu.nl/~quageo/>

In Utrecht (Department of Earth Sciences) fluvial systems are studied within the scope of numerical and analogue modelling of basin fill processes. Processes such as knickpoint migration, avulsion, and interaction of alluvial fan braided systems and axial fluvial systems in piggyback basins, and their response to sea level and climate change and tectonics are studied. During one of the mid-conference field trips the flume experiment facility of the Department may be visited. For more on this: <http://www.geo.uu.nl/Research/Sedimentology>

Research in the Applied Geology Department of the Delft University of Technology focuses on the modelling of fluvial reservoir architecture at various scales. On the pore-and-grain scale porosity and permeability are quantified as precisely as possible. On the reservoir scale, research aims to develop novel modelling techniques to achieve better quantitative geological models of the sedimentary architecture of the subsurface, and to translate the sedimentary units therein into flow units. To that end, information is integrated from outcrop and subsurface data, recent analogues and the process-response modelling of fluvial systems. For more on this: <http://www.ta.tudelft.nl/>

Besides the purely academic interest, the Dutch have an economic and social concern with the fluvial environment that surrounds them. Frequent floodings of the Rhine and Meuse rivers and their distributaries, added to the fact that the western half of the country is below sea level have triggered an applied research effort in river management. The Dutch Institute of Inland Water Management and Waste Water Treatment RIZA (part of the Dutch Ministry of Transport, Public Works and Water Management) is responsible for the knowledge on all aspects of fresh water systems in The Netherlands. Morphological processes in Dutch rivers are studied to predict the impact of engineering works, redesign of river landscape and climate change in a densely populated country. Research focuses on field studies of long-term bed degradation, morphological processes near bifurcations, transport and modelling of graded sediments, sediment transport and bed form behaviour during floods, and sediment exchange between channel and floodplain. RIZA takes part in the Netherlands Centre of River Studies (NCR), together with other river research institutes in The Netherlands. This collaboration involves institutes that develop fundamental scientific knowledge (universities), institutes that apply scientific knowledge (WL|Delft Hydraulics and TNO-NITG) and the institute RIZA that directs research. For more on this: www.riza.nl and www.ncr-web.org respectively.

The conference will take place late summer, in the city of Delft, The Netherlands. Delft is a town of 95000 inhabitants, situated in-between the major cities of The Hague and Rotterdam. It is world famous for its Delft Blue Pottery and has a rich history. The Delft University of Technology has a large off-spin to the high-tech research industry in The Netherlands. It thus provides a scenic and stimulating environment for the conference venue. The conference venue is the University's Auditorium, located in the University Campus and close to the city centre. We are confident that we have an attractive research programme and field trips, and hope to welcome you all in August 2005!!

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IAS Postgraduate Grant Scheme

IAS has established a grant scheme designed to help PhD students with their studies. We are offering to support postgraduates in their fieldwork, data acquisition and analysis, visits to other institutes to use specialised facilities, or participation in field excursions.

About 10 grants, each of up a maximum of 1000 Euros, are awarded twice a year.

These grants are available for IAS members only, and only for postgraduates. The application must include a short CV and a budget. A letter from the supervisor supporting the application must be sent directly to the Treasurer of the IAS.

An application form is in our home website (<http://www.iasnet.org>) and also in <http://www.blackwellpublishing.com/uk/society/ias>. Moreover, the application form can be requested from the Treasurer's Office (IAS, Office of the Treasurer, Ghent University, Department of Geology and Soil Science, Krijgslaan 281/S8, B-9000 Gent, Belgium; E-mail: Patric.Jacobs@UGent.be)

Applications must be sent to the Treasurer of the IAS

Application deadlines: 1st session:	March 31
2nd session:	September 30
Recipient notification: 1st session:	before June 30
2nd session:	before December 31

CALENDAR

DEEP-WATER SEDIMENTARY SYSTEMS OF ARCTIC AND NORTH ATLANTIC MARGINS

October 18-20, 2004
Stavanger
Norway

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SEDIMENTARY BASINS OF LIBYA, 3RD SYMPOSIUM. GEOLOGY OF EASTERN LIBYA BASINS AND ADJACENT AREAS.

November 21-23, 2004
Binghazi
Libya

The organising committee
National Oil Corporation (NOC)
P.O. Box 2855
Tripoli, Libya
Tel./Fax: (+218) 21-480 46 43
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12TH CONGRESS R.C.M.N.S.

2005 (exact date not
yet fixed)
Vienna, Austria

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24th IAS MEETING OF SEDIMENTOLOGY*
(Scenic Sedimentology)

January, 10-13, 2005
Muscat
Oman

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E-mail: homewood@squ.edu.om
Web-page: <http://www.squ.edu.om/sci/Centers/VR/IAS/home.htm>.

HOLOCENE ENVIRONMENTAL CATASTROPHES IN SOUTH AMERICA: FROM THE LOWLANDS TO THE ANDES*

Joint meeting of IGCP 490 and ICSU/IUGS

March 13-19, 2005
Laguna Mar Chiquita,
Province of Córdoba,
Argentina

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Web-page: <http://www.efn.uncor.edu/investigacion/ciges/EVENTS.htm>

IGCP 447 FIELD CONFERENCE ON NEOPROTEROZOIC CARBONATES «MOLAR-TOOTH STRUCTURE DOWNUNDER»

June 1-14, 2005
Adelaide -
Alice Springs,
Australia

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THE SEDIMENT FACTORY

SEDIMENT05 - 3RD ANNUAL CONFERENCE OF SEPM-CES

July 18-20, 2005
Gwatt, Thun area,
Switzerland

*Fritz Schlunegger
University of Bern
Phone: 0041 31 631 8767
Fax: 0041 31 631 4843
E-mail: sediment05@geo.unibe.ch
Web-page: www.geo.unibe.ch/sediment05*

GLACIAL SEDIMENTARY PROCESSES AND PRODUCTS*

August 23-26, 2005
University of Wales,
Aberystwyth
U.K.

Michael Hambrey
Neil Glasser
Bryn Hubbard
Centre for Glaciology
Institute of Geography and Earth Sciences
University of Wales
Aberystwyth SY23 3DB UK
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7TH INTERNATIONAL SYMPOSIUM ON THE CRETACEOUS

September 5-9, 2005
Neuchâtel
Switzerland

Karl B. Föllmi or Thierry Adatte
Institut de Géologie, Université de Neuchâtel, case
postale 2, CH-2007 Neuchâtel, Switzerland
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thierry.adatte@unine.ch
Web-page: <http://www.unine.ch/geologie/isc7/>
Fax nr.: 0041-718 26 01

THE NONMARINE PERMIAN

October 21-29, 2005
Albuquerque,
New Mexico, USA

Dr. Spencer G. Lucas
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Albuquerque, NM 87104 USA
Phone: 505-841-2873/ Fax: 505-841-2866
E-mail: slucas@nmmnh.state.nm.us

GONDWANA 12 CONFERENCE

November 6-11, 2005
Mendoza
Argentina

Carlos W. Rapela | crapela@cig.museo.unlp.edu.ar
Luis A. Spalletti | spalle@cig.museo.unlp.edu.ar
Centro de Investigaciones Geológicas,
Universidad Nacional de La Plata - CONICET
Calle 1# 644, B1900TAC La Plata, Argentina.
Phone/Fax: 54 221 4215677
Web site: <http://cig.museo.unlp.edu.ar/gondwana/>

PALAEOPEDOLOGY: NEW PERSPECTIVES ON OLD SOILS*

July 10-13, 2006
Cardiff
UK

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**17TH INTERNATIONAL
SEDIMENTOLOGICAL CONGRESS***

August 27 –
September 1, 2006
Fukuoka
Japan

Ryo Matsumoto
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University of Tokyo
Hongo, Tokyo 113, Japan
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Web-page: <http://sediment.jp/>

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<http://www.iasnet.org>