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IAS

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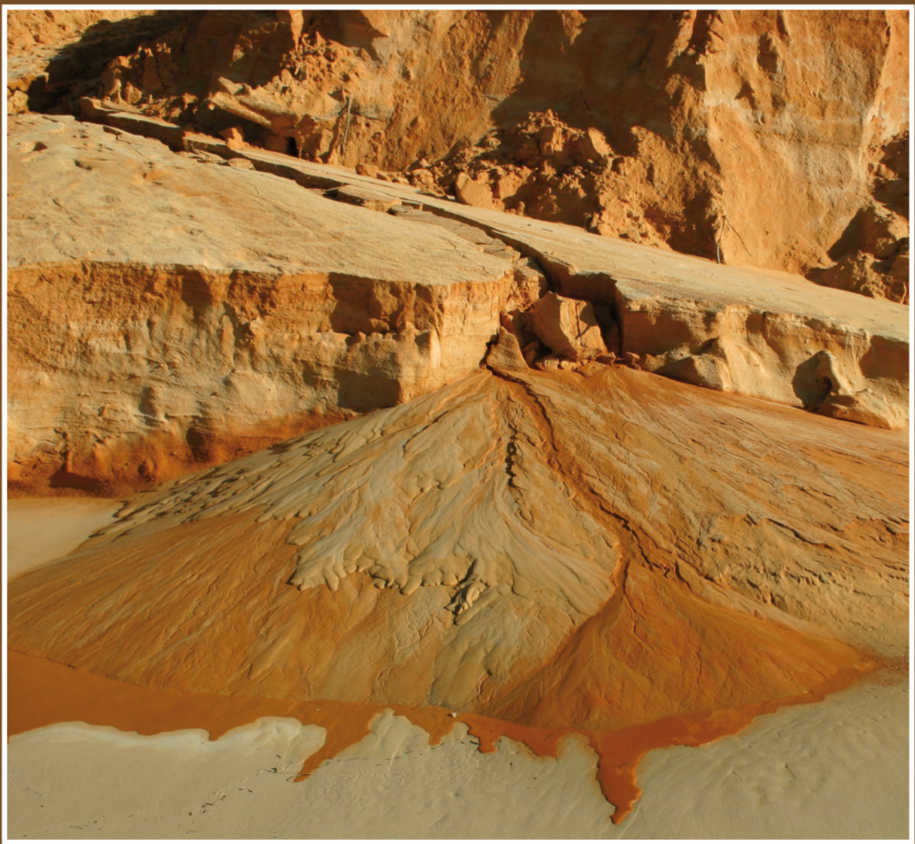

International Association of Sedimentologists

IAS Bureau and Council

Link to **IAS National Correspondents**:
http://www.sedimentologists.org/network/correspondents

CONTENTS

EDITORIAL

Newsletter 252 opens with a report from Alham al-langawi, the IAS National Correspondent from Kuwait, about the visit of the IAS General Secretary to Kuwait. The Central European Meeting of Sedimentary Geology, hosted in Olomouc, eastern Czech Republic is reported in the central part of the Newsletter. In the Student Corner, A. J. Jeffery from the School of Physical and Geographical Sciences, University Keele, Staffordshire (UK), reports on research sponsored by IAS through a Postgraduate Grant. Mr. Jeffery's research was designed to improve knowledge on the stratigraphy of ignimbrites. Also in the Student Corner, X. You, from the University of Geosciences, Beijing (China), presents his research on Cambrian stromatolites in the north-western part China. The research conducted by X. You was also supported by the IAS Postgraduate grant.

At the end of the newsletter a poster announces QuickLakeH 2014: an international multidisciplinary workshop and fieldtrip where the interactions between lakes and humans during the Quaternary period will be discussed.

Please note that the guidelines for the Student Grant applications have been updated.

I would like to remind all IAS members that:

- the IAS Newsletter 252 is published on-line and is available at: http://www.sedimentologists.org/publications/newsletter
- the next IAS Meeting will be held in 2015 in Krakow (Poland). For details, please check: http://www.sedimentologists.org/meetings/isc
- IAS has again proposed to co-sponsor a number of sessions at the upcoming AGU Fall Meeting 2014 in San Francisco (15-19 December, 2014, USA).
  - #1781. The palaeoceanographic value of contourite archives

(convenors: D. Van Rooij, B. Romans);
- #2815. Advances in Sub-Aqueous Paleoseismology: New Insights into Earthquake Recurrence (convenors: C. Goldfinger, K. Ikehara, M.E. Van Daele, M. Strasser);
- #3631. Stable carbon isotopes and the carbon cycle: extracting the signal from the noise (convenors: J. Trabucho-Alexandre, C.K. Junium, P.K. Swart);
- Please visit: http://fallmeeting.agu.org/2014/

The Electronic Newsletter (ENIAS), started in November 2011, continues to bring information to members. For info on ENIAS contact ias-office@ugent.be

Check the new Announcements and Calendar. Meetings and events shown in **CAPITAL LETTERS** and/or with * are fully or partially sponsored by IAS. For all of these meetings, IAS Student Member travel grants are available. Students can apply through the IAS web site. To receive the travel grant, potential candidates must present the abstract of the sedimentological research they will present at the conference. More info @ www.sedimentologists.org

Vincenzo Pascucci
(IAS General Secretary)


2015
KRAKOW
IAS
INTERNATIONAL ASSOCIATION OF SEDIMENTOLOGISTS
31st IAS Meeting of Sedimentology
22nd–25th June 2015 • Kraków, Poland
PHOTO PAWEŁ KRZAN
www.sedimentologists.org/ims2015
e-mail: ias2015@uj.edu.pl
JAGIELLONIAN UNIVERSITY IN KRAKÓW
POLISH GEOLOGICAL SOCIETY
1921
UNIVERSITY OF WARSAW
FACULTY OF GEOLOGY

Field trips

Pre-meeting

A1. Sedimentation on the Serravalian forebulge shelf of the Polish Carpathian Foredeep.
A2. A selenite evaporitic stage of the Polish Carpathian Foredeep: the Badenian Nida gypsum deposits.
A3. Modern geological processes in the Baltic Sea coastal zone: sandy beaches, coastal dunes, cliff coasts and impact of extreme events.
A4. Evolution of a Devonian carbonate platform in the Holy Cross Mts.
A5. Transgressive Callovian succession and Oxfordian sponge-microbial buildups in the Kraków Upland.
A6. The inception, growth and demise of a Mesozoic pelagic carbonate platform: the Krížna Unit in the Western Tatra Mts.
A7. Geology and wines of the Kraków area.

Post-meeting

B1. Bedded chalk marls in the Opole Trough: epicratonic deposits of the Late Cretaceous super-greenhouse episode.
B2. Miocene sedimentary succession in the Eastern Carpathian Foredeep in relation to the Carpathian orogen evolution.
B3. Post-Variscan evolution of the Sudetes in sedimentary and geomorphic record.
B4. Palaeokarst, neptunian dykes, collapse breccias, mud mounds and sedimentary unconformities in the Slovakian Central Carpathians.
B5. The Middle Triassic Muschelkalk of southern Poland as an example of tectonically active, shallow-marine carbonate basin.
B6. Controls on the development and facies succession of a Mississippian carbonate platform in the Kraków Upland.
B7. Cenozoic freshwater carbonates in the Slovakian Central Carpathians: sedimentary facies, environments, hydrological control and depositional history.
B8. Some current sedimentological controversies in the Polish Carpathian flysch.
B9. Sedimentation of the late Lutetian–Priabonian carbonates in the Tatra Mts. and its controlling factors.

Organizing committee:

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Organized by:

Polish Geological Society
Institute of Geological Sciences, Jagiellonian University
Faculty of Geology, University of Warsaw

Supported by:

International Association of Sedimentologists

Meeting calendar:

15th October 2014 – deadline for proposals of sessions special session topics
15th November 2014 – distribution of Second Circular
15th November 2014 – online registration opens
28th February 2015 – deadline for early-bird registration fee
28th February 2015 – deadline for field-trip and short-course registration/fee
28th February 2015 – deadline for abstract submission
15th April 2015 – acceptance of abstracts
22nd May 2015 – deadline for standard registration fee
31st May 2015 – distribution of Third Circular with final programme

Meeting themes:

1. Physical processes in sedimentology
2. Biotic processes in sedimentology
3. Chemical sedimentary processes and diagenesis
4. Geochemical record of sedimentation
5. Economic sedimentology
6. Freshwater carbonates
7. Alluvial, colluvial and lacustrine depositional systems
8. Aeolian depositonal systems
9. Glacigenic depositional systems
10. Volcanigenic depositional systems
11. Shallow-marine depositional systems
12. Deep-marine depositional systems
13. Carbonate platforms and reefs
14. Cycles and rhythms in sedimentary records
15. Sequence stratigraphy: eustatic vs. tectonic control on sedimentation
16. Sedimentology for challanges of global warming
17. Sedimentary record of climate change
18. Trace fossils and environmental analysis
19. Remote sensing, imaging and numerical modelling in sedimentology
20. Geophysics in sedimentology
21. Environmental sedimentology: challenges of predicting geohazards
22. Research frontiers in sedimentology

2015 IAS KRAKÓW

IAS International Association of Sedimentologists

31st IAS Meeting of Sedimentology

22nd–25th June 2015

Kraków, Poland

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JAGIELLONIAN UNIVERSITY IN KRAKÓW

POLISH GEOLOGICAL SOCIETY 1921

UNIVERSITY OF WARSAW FACULTY OF GEOLOGY

Nearly 30 years have passed since the last IAS meeting was held in Poland (1986), under totally different geopolitical, social and economic circumstances. A whole new generation of sedimentologists in Poland and worldwide have meanwhile conducted a wide range of interesting studies, bringing new ideas and concepts. It is thus a high time for another IAS Meeting of Sedimentology to be held in Poland. The hosting city will again be Kraków, at the foot of the Carpathian Mountains in southern Poland. A broad range of sedimentological themes are suggested for the meeting, and proposals for specific session topics are invited. Pre- and post-meeting field trips will focus on a wide spectrum of topics, from the deposition of Palaeozoic carbonates to modern sedimentation processes.


Old City (Barbakan fortress)
Photo Barbara Maliszewska


Wawel castle and Vistula river
Photo Paweł Krzan

Kraków, the former capital of Poland, is a most beautiful historical city in the centre of Europe – full of architectural and cultural treasures. The city's charming medieval Old City district was recognized as a UNESCO world heritage site even before were the ancient pyramids of Egypt. The Jagiellonian University, the oldest *alma mater* in Poland and second oldest in Central Europe, was established in 1364 and had Nicolas Copernicus among its most prominent alumni. When it comes to sedimentology, this university was the workplace of Marian Książkiewicz (1906–1981) and Stanisław Dżułyński (1924–2001), who co-founded with Philip H. Kuenen the early concept of turbidity current. An impressive collection of Stan Dżułyński's samples of bed solemarks is on a permanent display in the museum of the Institute of Geological Sciences (only a 10-minute walk from the meeting venue).


Main Market Square
Photo Piotr Kwas

The Jagiellonian University vigorously develops, and the IAS meeting in 2015 will be held in its modern Conference Centre located close to the Old City district in the very heart of Kraków. The walking distance to the Main Market Square – the largest medieval city square in Europe – is only 10 minutes, with the numerous restaurants along the way prepared to offer special reduced prices to the meeting participants. (Anyway, the food and drinks in Poland are inexpensive.) Kraków is widely appreciated for its night life and a wide range of cultural entertainment, including live music from jazz to rock.



Conference Centre
Photo Anna Wojnar

Participants are encouraged to arrive a few days earlier or stay longer in Kraków in order to visit such important historical places as the Wawel Royal Castle with its spectacular medieval art collection, unique tapestries and Leonardo da Vinci's famous *Lady with an Ermine*, and with the legendary Dragon's Den on the adjacent Vistula river bank; the city's many other museums and the nearby Wieliczka salt mine with its impressive underground chambers (now a museum and a UNESCO world heritage site); the city's Old Jewish Quarter of Kazimierz with its restored architecture, ethnic music/atmosphere and kosher cuisine; and also to enjoy the traditional rafting on Dunajec river in the Pieniny Mts. The accompanying persons may readily attend all these popular touristic trips alone.

As a very popular touristic city, Kraków has an extensive accommodation infrastructure. The meeting participants can choose among luxurious 5-star hotels, regular 4- or 3-star hotels and guesthouses, and some least expensive hostels. Most of the accommodation places recommended (details in the 2nd circular and on the meeting website) are located in the city centre, within a walking distance to the Conference Centre. The meeting's gala dinner will be held in the unique and unforgettable undergrounds of the Wieliczka salt mine near Kraków.


Jagiellonian University
Photo Anna Wojnar

The city of Kraków is easily accessible through its international Balice airport, hosting most of the European airlines and conveying annually nearly 3.5 million passengers. There are also convenient fast-train and express bus connections from Warsaw, the capital of Poland, and from all other main Polish cities. Convenient access by car from the Polish western border with Germany is highway A4, and there is also an easy direct access by main roads from the neighbouring Ukraine, Slovakia and the Czech Republic.

All the interested sedimentologists are most cordially welcome to Kraków and are invited to register as soon as possible, because the number of places for the individual field trips is limited.


Wieliczka Salt Mine (gala dinner hall)
Photo Rafał Stachurski



Jagiellonian University
Photo Anna Wojnar


Wieliczka Salt-Mine chamber
Photo Rafał Stachurski


Nightlife in Kraków
Photo Renata Jach

REPORT

THE VISIT OF THE IAS GENERAL SECRETARY TO KUWAIT

The National correspondent of Kuwait, Dr. Alham al-langawi, organized a visit to Kuwait for Prof. Vincenzo Pascucci (IAS General Secretary) to promote IAS in this country. The visit included fieldtrips, a lecture in the Science Department-PAAET, and sightseeing of Kuwait. The field trips were organized over two days; the north of Kuwait and the south of Kuwait respectively.

Kuwait lies on the northern tip of the Arabian Gulf, between latitudes

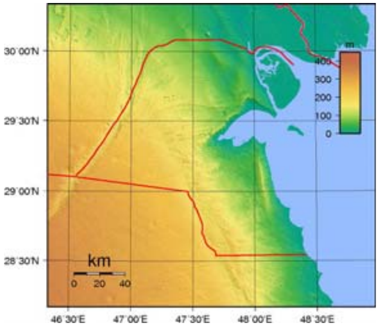

Figure 2. Kuwait elevation map

Figure 1. Kuwait

Figure 3. Synthetic geological map of Kuwait with the field trip stops indicated.

Figure 4. General view of the Ghar Formation

28 30 and 30 06 North, and between 46 30 and 48 30 eastern longitudes (Fig. 1). Kuwait's northern borders are shared with Iraq and the Arabian Gulf, and Iran borders it from the east, while the Kingdome of Saudi Arabia borders Kuwait from the south and southwestern directions. Kuwait is characterized by a flat desert environment with a major decrease in elevation from west to east. Kuwait hosts variable environments within its relatively small area (17,818 km^2) which include: (1) a low elevation coastal environment that extends for 500 km including the island coasts, (2) a desert environment which is a natural continuation of the vast desert comprising the Arabian Peninsula, and (3) relatively flat islands, all of which are unurbanized, except for Failaka Island (Fig. 2). Most of the desert area is flat, with a general decrease in altitude towards the east and northeast, with some isolated hills and mountains. There are also some depressions scattered around the desert that fill with surface runoff water during the rainy seasons.

The major topographical features in Kuwait are the Jal-Az-Zor escarpment, Wadi Al-Batin, Wadi Um Al Rimam and Ahmadi Ridge. Only rocks from early Miocene to Recent are exposed on the surface and are best located at the Jal-Az-Zor escarpment (Fig. 3).

Figure 5. Cross-beds in the Ghar Fm

Fieldtrip:

1. Jal Al Zoor Escarpment- north .

Jal Al-Zoor Escarpment (Fig. 3), which forms a ridge at Jal al-Zoor (145 meters high), is considered to be the most conspicuous morphological feature in Kuwait. The escarpment is divided into two parts: the first part extends 40 northeast and is 35 km long with a maximum elevation of 145 m; and the second part extends 35

Figure 6. The Sabkha at Al Subi-yah

northwest and is 25 km long with a maximum elevation of 115 m. The different facies indicate that the area was affected by different sedimentological environments, especially fluvial and marine environments. Rocks of the

Figure 7. The wide green area Al Salam beach

Figure 8. Intertidal zone at low tide, showing the oolitic shoals parallel to the beach-line.

escarpment, with a total thickness of 400-350 m, range in age from Miocene to Recent and are named the Kuwait Group. The Kuwait Group includes the following formations: Dibdibba Fm. 30-35 m thick and Pleistocene- Upper Miocene in age; Fars Fm. 30-35 m thick and lower to middle Miocene in age, and Ghar Fm. 230 m thick and Oligocene-lower

Figure 9. Quartz-oolitic ridge

Miocene in age. Only the upper 20 m of the Ghar formation is exposed at the foot of the escarpment. During the fieldtrip we managed to examine the strata in a traverse through one of the valleys that cut through the escarpment. The rocks include some important sedimentary features such as graded beds, karst surfaces, nodules baring levels, palaeosols, and calcified

Figure 10. Oolitic ridge

plant roots. The rocks were deposited in a fluvial/alluvial environment.

2. The northern mudflats and sabkha environments.

The northern beaches of Kuwait are classified as mudflats and fine-sand beaches. We made two stops, one at the tip of Alsubiyah near Bubian Island and the second at Al Salam Beach. The first location is characterized by a low elevation, muddy to fine sand beach that is bordered by mixed sabkhas. The second location is affected by

Figure 11. Fossiliferous- oolitic ridge

water that flows through to the sea from the sewage treatment plants. At Al Salam beach we came across the different algal types which grow extensively on the fine sand and silt beach sediments and form a wide green area containing several different types of algae.

3. Al Khiran area- south of Kuwait.

The second field trip was to the south of Kuwait near the border with Saudi Arabia, to a place called Al Khiran. The southern shores of Kuwait are characterized by oolitic beaches and carbonate sabkhas, especially at Al Khiran (Fig. 8). Several consolidated dune ridges are exposed; the older is a quartz-oolitic ridge (Fig. 9), and the two younger ridges are white oolitic ridges (Fig. 10). Moreover, the

Figure 12. Broken-up oolitic ridges

youngest is a highly fossiliferous-oolitic ridge, possibly indicative of a high energy beach environment (Fig. 11). These ridges are characterized by cross bedded strata, karst upper surfaces, and differential weathering, and are believed to have been formed

Figure 13. Artificial channels at the AL Khiran Pearl City

Figure 14. a) Photograph of the sabkhas at Al Khiran where holes have been dug. In some areas, the subsurface brines are exposed in the holes and b) halite crystals form due to evaporation.

during the middle late Pleistocene (500 to 10 ka). Unfortunately this area is under heavy excavation as it is being converted to a residential area called The Al Khiran Pearl City (Fig. 12). The sabkhas have been excavated completely to form the artificial estuaries which will be filled by sea water (Figs 13, 14). Some of the ridges are now hammered down and removed to flatten the area for building purposes.

Dr. Alham al-langawi
IAS National Correspondent from Kuwait
(drlangawi@gmail.com)

Figure 15. Vincenzo, Alham and Mohamad

REPORT

CENTRAL EUROPEAN MEETING OF SEDIMENTARY GEOLOGY (CEMSeG)

Sedimentary geologists from Central and Eastern Europe came together at the international conference «Central European Meeting of Sedimentary Geology», which was hosted by the beautiful historical city of Olomouc, eastern Czech Republic from June 9 to 13, 2014. The meeting received strong support from IAS in the form of student travel grants.

The goal of the meeting was to bring together geoscientists and

Figure 1. CEMSeG participants in front of the conference venue

students that work in Central Europe and are connected by similar traditions, history and present-day development. The target countries, Czech Republic, Slovakia, Poland, Hungary and Slovenia, all underwent rapid change within the last 25 years of post-communist history and all have very similar characteristics that have been forged for centuries. This long history generates natural friendship and a common way of thinking between geoscientists, which becomes evident at every meeting and at every conference. However, too often the meetings are located far outside the region. This led us to the idea of holding a regular sedimentary geology meeting that would strengthen the exchange of geological knowledge and promote the Central European region as an important part of the European community of sedimentary geologists. Central Europe is an important hub of European geology, a place where the orogenic systems of the Carpathians, the Alps and the Variscides virtually meet each other within in a couple of kilometres, and are surrounded by platform sedimentary systems.

The meeting was hosted by the Department of Geology of the Palacký University of Olomouc, which is the second oldest university in the territory of Bohemia and Moravia, Czech Republic. Olomouc is a typical university town with one hundred thousand inhabitants and about twenty five thousand university students. Ranked within the UNESCO heritage, Olomouc is a jewel of baroque architecture, and besides Prague, is considered by many as the most beautiful town in the Czech Republic.

The conference was attended by nearly 90 registered participants from 15 countries in Europe, Asia and North America. Participants presented 66 oral

Figure 2. Fold-and-thrust tectonics in Lower Carboniferous basin-plain turbidites; Stará Ves, Moravo-Silesian Culm Basin field trip

Figure 3. Field trip leaders Gary Kocurek and David Mohrig discussing late Pleistocene lacustrine deposits; post-conference field trip in South Moravia

and poster contributions. The meeting focused on plenary sessions with no parallel sessions, to promote scientific communication across barriers separating specialized fields. This approach was accepted very positively as shown by the opinion of many participants, and contributed to a friendly and family-like atmosphere. The presented talks and posters were organized into four thematic sets:

- Clastic depositional systems: processes and controls
- Sedimentary archives of environmental change from Neogene to Anthropocene
- Reading the deep-time sedimentary record: stratigraphy across depositional systems and time
- Sedimentary record of tectonic and geodynamic evolution of Central Europe

The sessions were introduced by five excellent keynote lectures given by Gary Kocurek (University of Texas at Austin), Mark G. Macklin (Aberystwyth University, Wales), David Mohrig (University of Texas at Austin), Orsolya Sztanó (Eötvös Loránd University, Budapest) and Michael Wagreich (Vienna University, Austria).

There were several strong and viable working groups that presented very good results. Many students were actively involved in presenting talks and posters. The groups included the Budapest «Lake Pannon group» led by Orsolya Sztanó, the Bratislava team of students focusing their interest on deltas and led by Michal Kováè, a team led by Andrej Šmuc from Ljubljana studying various aspects of young sediments and the environmental sedimentology-geochemistry group led by Tomáš Matys Grygar from Prague, to name just a few.

Figure 4. IAS Travel Grant recipients: left-to-right: Jan Flašar, Tomáš Kumpan, Lilla Tõkes, Mehrdad Sardar Abadi, Jan Udovè, István Róbert Bartha and Roland Nádaskay

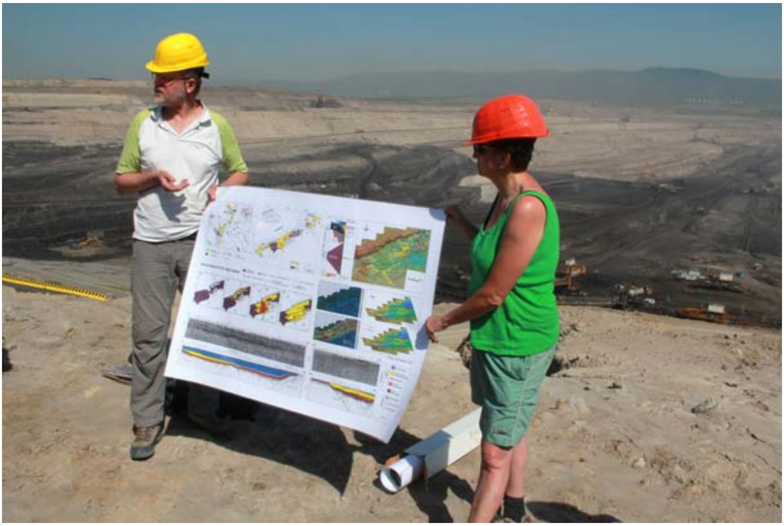

Figure 5. Field trip leaders David Ulièný and Lenka Špièáková in the Bílina open-cast coal mine; Neogene and Cretaceous deltas field trip.

The meeting program was supplemented by three field trips. A two-day pre-conference excursion «Deltaic Deposition in Cretaceous and Neogene Basins of North Bohemia" was led by David Ulièný, Lenka Špièáková and Stanislav Èech (Prague). This field trip took 20 delta-eager participants into the world-class outcrops of Tertiary deltaic deposits in the huge open-cast coal mine in Bílina, North Bohemia and into the beautiful rock cities exposing Cretaceous deltaic deposits in the Bohemian Paradise. The second pre-conference field trip, led by Ondøej Bábek, Daniel Šimíèek (Olomouc) and Jiøí Otava (Brno), was directed in the Moravo-Silesian Culm Basin, where Lower Carboniferous turbidite systems of the Variscan foreland are exposed. This excursion was attended by 15 participants who enjoyed a set of hundred-m-scale quarries and natural outcrops of deep-marine siliciclastics. A one-day post-conference field trip led 22 participants under the guidance of Jaroslav Kadlec (Prague), Gary Kocurek and David Mohrig (Austin, Texas) to South Moravian river valleys to see the «Climate-controlled fluvial, lacustrine and aeolian processes in the Last Glacial and Holocene».

In addition to the geology of the region, participants had the chance to enjoy the culture and historical spirit of the city of Olomouc at a baroque music concerto held in the Corpus Christi Chapel of the Jesuit College in the baroque city centre. This event was immediately followed by an open-air social dinner held on the ramparts of the Jesuit College that ended with a jazz band live performance.

The conference enjoyed auspices and financial support from the IAS, particularly in the form of student travel grants for 7 IAS student members from the Czech Republic (3), Hungary (2), Iran (1) and Slovenia (1) who actively presented their results as a poster or oral contribution. We are proud to have enjoyed this kind of support. Thank you, IAS!

The Central European Meeting of Sedimentary Geology (CEMSeG) was a success, as could be seen from the positive feedback of many participants. The community of sedimentologists and stratigraphers in our region proved to be very viable and ready for action. As a result. the organizing committee and the whole community expressed a strong intent to hold such regional meetings on regular basis, most probably bi-annually, somewhere within the region of Central Europe. We will do our best to put this intention into practice and hope we will be able to invite the community to the second Central European Meeting of Sedimentary Geology to be held in 2016.

Ondøej Bábek
Conference organizer
IAS National Correspondent, Czech Republic

STUDENT CORNER

IAS Postgraduate Grant Scheme 1st Session, 2013

TOWARDS AN IMPROVED MODEL FOR THE EMPLACEMENT MECHANISMS AND CHEMO-STRATIGRAPHY OF IGNIMBRITES

Use of the IAS postgraduate grant

The postgraduate grant made available to me by the International Association of Sedimentologists was used to fund a two-week fieldwork session on Terceira island, Azores. This fieldwork allowed me to undertake a project aimed at investigating the peralkaline ignimbrites within the stratigraphy of the island. In addition to the primary results of this study, it has also given me the opportunity to develop my own skills as a field geologist and an independent researcher. The current results of the study were disseminated via an oral presentation entitled 'Eruption and emplacement of peralkaline ignimbrites, Terceira, Azores' at the '1st International Workshop on Volcano Geology' in July 2014. I am extremely grateful to the IAS for providing me with the invaluable opportunity to undertake this research project.

Introduction

Ignimbrites contain vital information relating to the parent pyroclastic density current (PDC) from which they are deposited. However, the processes of transportation and sedimentation remain controversial. Proposed models have evolved from *en masse* deposition (Sparks et al., 1973) to incremental deposition and aggradation (Branney & Kokelaar, 1992), but do not account fully for the wide variation in field observations. Branney & Kokelaar (2002) fundamentally changed our understanding of the emplacement and deposition of ignimbrites, proposing a conceptual model that provides a framework applicable to the majority of ignimbrites, regardless of minor variations in internal structure. However, much of the work that contributed to the development of this model was focused upon large-volume ignimbrites. The internal structure of small-scale ignimbrites has not been studied in the same detail, and, as such, the applicability of the model of Branney and Kokelaar (2002) remains untested in these environments.

Methods

The fieldwork session was used to collect detailed stratigraphic, lithological and sedimentological information for each of the seven ignimbrite formations on Terceira (the Lajes-Angra Ignimbrite Formation (LAI), the Linhares-Matela Ignimbrite Formation (LMI), the Vila Nova-Fanal Ignimbrite Formation (VFI), the Caldeira-Castelinho Ignimbrite Formation (CCI), the Grota do Vale Ignimbrite (GVI), the Pedras Negras Ignimbrite (PNI) and Ignimbrite-1 (Ign-i) Gertisser et al., 2010), in addition to trace element geochemical data collected in-situ, using a field-portable, energy-dispersive X-ray fluorescence (FP-XRF) device.

Preliminary results

The Lajes-Angra Ignimbrite Formation (LAI) was identified at sixteen localities across the northern and southern coastline of Terceira Island. Substantial facies variations are present, including welded units, regionally- and locally-developed flow units with well-developed inverse grading of pumice clasts, massive, pumice-rich units, deposit thickness

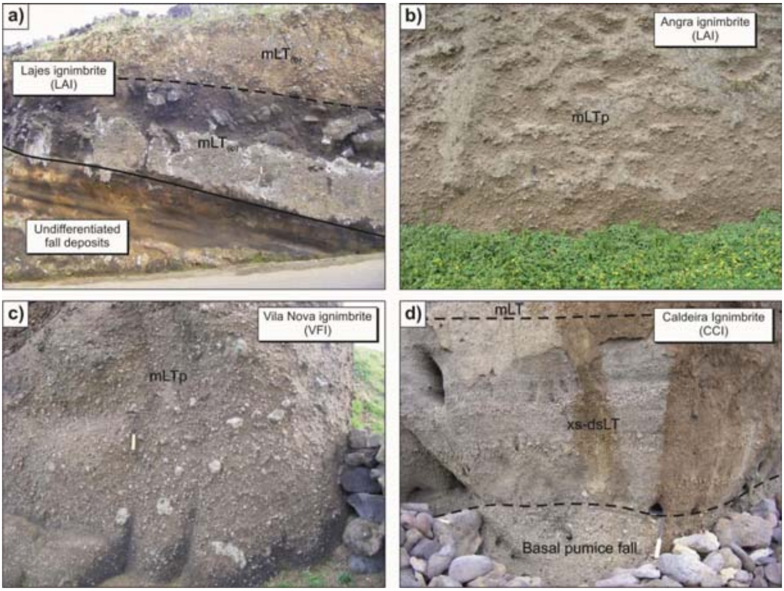

Figure 1. Photographs of key ignimbrites on Terceira, Azores (a) The Lajes member of the LAI, observed with two flow units ramping upwards on a palaeo-surface (b) The Angra member of the LAI, exhibiting a massive and pumice-rich nature (c) The Vila Nova member of the VFI, observed as a massive lapilli-tuff (d) The Caldeira member of the CCI, showing a basal pumice fall deposit, a cross-bedded ground surge deposit and the overlying massive lapilli-tuff. mLT = massive lapilli tuff, ip = inversely-graded pumice, np = normally-graded pumice, p = pumice-rich, xs = cross-stratified, dsLT = diffuse- stratified lapilli tuff

variations and transitions from dense, dark pumice to vesicular, light pumice clasts (Fig. 1a, b). Initial geochemical investigation of the LAI indicates a slight decrease in incompatible elements such as Rb, Y, Zr and Nb, and an increase in compatible elements such as Ba, with increasing stratigraphic height. This observation is consistent with progressive tapping of a chemically zoned magma body (Fig. 2).

The Vila Nova-Fanal Ignimbrite Formation (VFI) was investigated at two locations on the north coast and one location on the south coast. The VFI is pumice-rich and non-welded (Fig. 1c), with up to eight individual flow units, each exhibiting well-defined inverse grading of pumice clasts, and a pumice fall deposit preserved at its base. Geochemical analyses reveal contrasting trace element abundances for the initial pumice fall and the overlying ignimbrite, that are defined by a substantial decrease in Rb, Y, Zr and Sr, accompanied by an increase in Ba with increasing stratigraphic height.

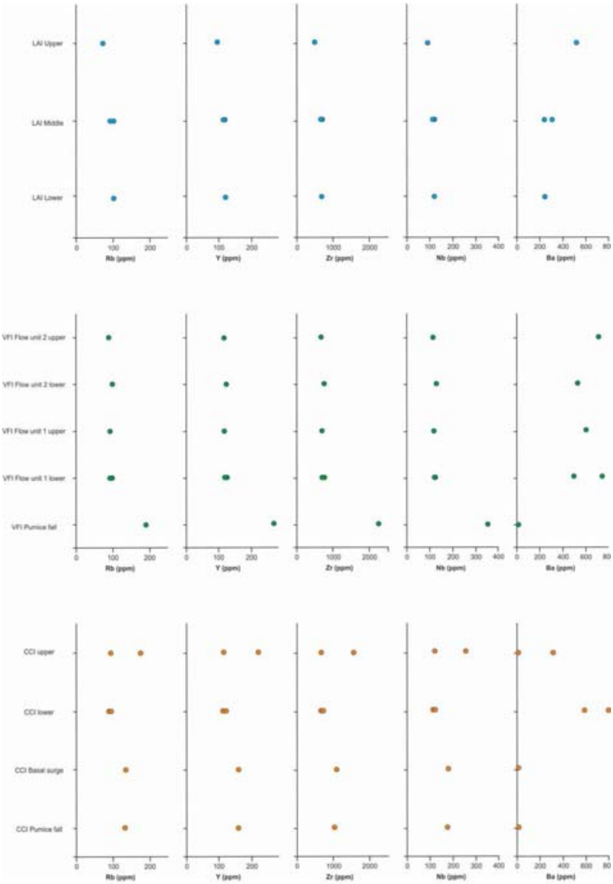

Figure 2. Geochemical variation diagrams plotting selected trace elements against stratigraphic height within the Lajes

In contrast, trace element abundances within the ignimbrite are essentially homogenous (Fig. 2). The pumice fall most likely indicates the presence of a plinian eruption column during an early phase of the eruption. As such, it is suggested that this geochemical contrast highlights the presence of a more evolved cap within the magma system prior to eruption.

The Caldeira-Castelinho Ignimbrite Formation (CCI) was identified at six locations on the north and south coasts. Like the younger VFI, it exhibits an initial pumice fall at its base, but unlike.

Ignimbrite (LAI), the Vila Nova Ignimbrite (VFI) and the Caldeira Ignimbrite (CCI) the other ignimbrites of Terceira, the CCI also has a well-preserved, cross-bedded, diffuse-stratified lapilli tuff, interpreted as a surge unit by Gertisser et al., (2010) (Fig. 1d). This is followed by a non - welded, pumice-rich, lapilli-tuff, which can, in places, be divided into up to three flow units, each marked by inversely-graded pumice. Geochemically, the initial pumice fall and ground surge appear homogenous, with very similar trace element concentrations. The overlying flow unit exhibits uniformly lower Rb, Y, Zr and Nb contents. This trend does not, however, extend into the above flow unit, which instead yields variable incompatible and compatible element abundances.

Conclusions

1. The facies variations observed within the ignimbrites of Terceira provide insights into their parental pyroclastic density current. For example, the abundance of massive lapilli tuff facies (mLT) on Terceira is indicative a fluid escape-dominated flow- boundary zone, in which deposition promotes the upward flux of fluid, which in turn maintains the current (Branney & Kokelaar 2002).

2. The presence of two distinctive units within the Lajes member of the LAI, each defined by reversely-graded pumice clasts, indicates two discrete periods during the eruption, during which deposition was changing with time. The widespread nature of this feature across the island suggests that this variability in deposition was produced by changes at the eruptive source rather than local phenomena (e.g. migration of bedforms or channels). The pronounced reverse-grading of pumice clasts in each unit likely highlights two distinct phases of waxing current, though this may also result from pumice flotation immediately after deposition.

3. The pumice fall deposit at the base of the CCI suggests that the eruptive sequence began with a plinian eruption column. The overlying cross-stratified diffuse-stratified unit exhibits characteristics of a hot, dry current, and most likely represents an initial phase of unsteadiness in current, with a traction-dominated flow boundary. This was followed by a transition to fluid-escape-dominated flow-boundary zone conditions, which is indicated by the overlying massive lapilli tuff facies, and may have resulted from an increase in current concentration.

4. Geochemical traverses through the LAI, VFI, and CCI all provide evidence for geochemical zonation within the pre-eruptive magma reservoir. This is particularly pronounced in the VFI, where the initial pumice fall is significantly more enriched in incompatible elements than the ignimbrite that overlies it, highlighting the presence of a cap of more evolved magma within the magma reservoir.

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A. J. Jeffery
School of Physical and Geographical Sciences,
Keele University,
Keele, Staffordshire, ST5 5BG, U.K.
a.j.jeffery@keele.ac.uk

STUDENT CORNER

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STRONTIUM ISOTOPE COMPOSITION IN CAMBRIAN STROMATOLITES IN THE NORTHWESTERN PART OF THE TARIM BASIN, NORTHWEST CHINA: INSIGHTS ON ORIGIN OF DOLOMITE FORMATION

1 Introduction

Dolomite [$CaMg(CO_3)_2$] is abundant in sedimentary rocks throughout the geological record, but it is rarely found in modern sediments. Also, it cannot be precipitated under low-temperature conditions in the laboratory without microbial mediation and, as a result, its origin remains a long-standing enigma. Stromatolitic dolomites occur within a Cambrian sedimentary section in Tarim basin, which is the largest endorheic basin in China. The dolomites show petrographic textures and geochemical signals indicative of a enecontemporaneous and perhaps microbially influenced origin. Thus, they may preserve geochemical signatures documenting the conditions during their formation.

The Tarim Basin developed from a continental crust composed of the Proterozoic metamorphic rocks into a Mesozoic and Cenozoic foreland basin (Jia, 1997). Several wells reach the Cambrian strata in the basin: the Awatage Formation (which has a typical red color) can be observed in the Yaha 5 and Yingmai 7 wells of the Tabei area; the Tazhong uplift can be observed in the Tacan 1 well; and the Bachu uplift is evident in the Fang 1 well (Chen *et al.*, 2008). However, typical stromatolites are rarely found in the drilling cores. The outcrops are regarded as appropriate for research on stromatolites, especially those in the Penglaiba section (Jia, 199; You *et al.*, 2013; Wang *et al.*, 2011). Reconstruction of palaeo-temperature based on oxygen isotopes indicates that these dolomites formed at surface seawater temperature. Moreover, mineralized filaments and coccoid remains were observed. Furthermore, scanning electron microscope imaging revealed spherical crystal aggregates resembling dolomite crystal structures formed in culture experiments. These crystal structures evidence that dolomite formed under conditions of strong inhibition. Nevertheless, the exact

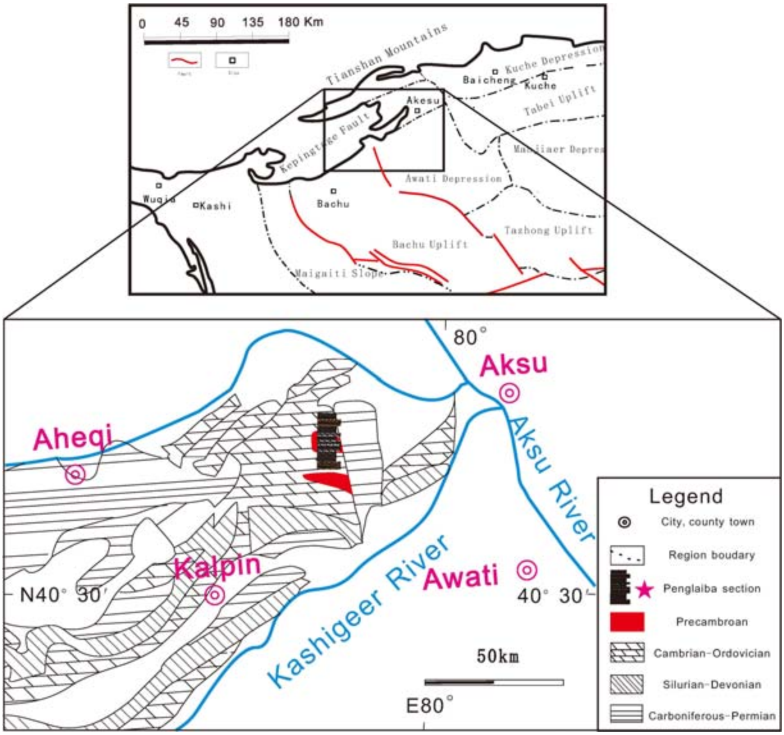


Figure1. Tectonic units of the Tarim Basin and geological units of the study area (modified after (Jia, 199; You et al.*, 2013; Wang* et al.*, 2011))*

biogeochemical conditions during dolomite formation in Cambrian stromatolites are poorly constrained.

2 Geological setting

The study region is located in the Kalpin area near the city of Aksu (Xinjiang Autonomous Region, north-western China) on the north-western margin of Tarim Basin. The Tarim Basin, surrounded by the Kunlun, Tian Shan and Altyn Tagh mountains, comprises extensive Cambrian to Early Ordovician dolomitic deposits, which are up to 1,692 m thick in the west (Shao *et al.*, 2002). The internal structure of the basin reflects a complex geological history. One of the distinctive features of Tarim Basin is the development of a series of regional tectonic unconformities and basin-scale palaeo-uplift belts (Jia, 1997). Pre-existing basement structures exerted a pronounced effect on subsequent sedimentation and diagenesis. The geometry of these deposits and carbonate platforms is intimately associated with the position and orientation of complex tectonic displacements from the Pliocene to the Holocene (Allen and Viocent, 1999; Yin *et al.*, 1998).

Our samples were collected from a well-preserved Middle Upper – Upper Cambrian outcrop of the Penglaiba section (N40°55.204, E79°53.951) (Fig. 1), which is 826.3 m thick and consists mainly of dolomitized stromatolites.

The thickness of the Awatage Formation is 170.5 m, and the stromatolites are distributed on the top of the Formation, close to the boundary between the Middle and the Upper Cambrian. Therefore, the Awatage Formation predominately was deposited in a shallow evaporative environment represented by sheet-like beds, 10 to 20 cm thick, with locally erosive bases. The beds are composed of micritic and fine-grained dolomite showing horizontal-bedding and cross-bedding structures. These beds are interlayered with centimetre-thick greenish to reddish mudstones, which contain abundant lenticular anhydrite crystals or moulds. They were deposited in the inter-supratidal zone of the lower sabkha and are characterized by frequent sub-aerial exposure surfaces, anhydrite nodules, or gypsum pseudomorphs. The overlying Lower Qiulitage Formation contains intercalated calcrete, stromatolitic and siliceous dolomite beds, which are continuous for up to a maximum of metres-thick cycles of microbial beach and tidal flat. Every cycle comprises 10–50 cm-thick fine crystalline dolomite and 1–10 cm-thick medium-grained dolomite.

3 Methods and sampling

Thin sections were prepared for standard and fluorescence microscopy. Scanning electron microscope (SEM) studies were carried out on polished thin sections or fresh broken surfaces. All samples were ultrasonically cleaned with alcohol. Some samples were first etched with dilute hydrochloric acid before ultrasonic cleaning. To ensure that each sample could be used for microanalysis and textural study, two replicate samples were removed from the same position. One sample was carbon-coated and the other was gold-coated. A Gatan Model 682 precision etching and coating system (PECS) was used to spatter the gold coating onto the SEM samples and fresh broken surfaces to improve the conductivity. The spattering was carried out by two Penning ion guns trained on a 99.99% pure gold target. The PECS coating system is designed to slowly deposit electron-transparent amorphous gold coating with a built-in thickness monitor, facilitating a controlled deposition of 1.2 Å of gold per second with the ion beam at 300 amps. In this way, a 15 nm-thick gold coating was deposited onto all spattered samples. All microstructures and surface morphologies were observed using JEOL JSM–6490 scanning election microscope and NovaÔ NanoSEM 230 field emission scanning election microscope (FESEM). At the same time, semi-quantitative analyses of submicron-sized spots were performed with an energy dispersive X-ray (EDX) spectrometer. The SEM/EDX analyses were performed at the State Key Laboratory for Mineral Deposits Research and the National Laboratory of Solid State Microstructures, Nanjing University.

Microsamples (~70 mg) of least altered visible laminae of micritic dolomite will be drilled from thin-section cuttings using a dental drill. Samples were weighed (to 0.1 mg precision) into Savillex 7.5 mL Teflon-PFA vials and dissolved on a hotplate at room temperature using 2.0 mL of 0.2 M HCl for one night. Each sample was centrifuged for 8 min at 5000

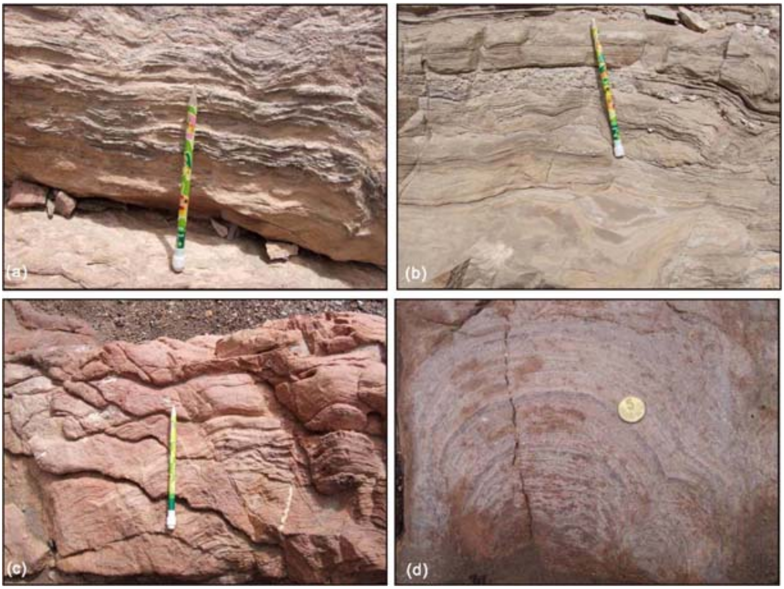


Figure 2. Field images of the stromatolitic dolomites. (a)Stromatolites in the Awatage Formation are filled with low-relief planar-domal laminations; (b)Low-relief planar-domal laminations in the middle part of Qiulitage Formation;(c)(d) Low-relief planar-domal laminations and domes in red colour at the bottom of Qiulitage Formation

rpm. Then, the supernatant is picked up from the centrifuge tube and dried on a hotplate. Next, the samples were re-dissolved with 1.0 mL of 2.5 M HCl and the sample solution was loaded onto the pre-conditioned resin column with 2 mL of AG50W×12 (200-400 mesh) for the separation of Sr from the sample matrix. After rinsing four times with 0.5 mL of 2.5 M HCl, the column was washed with 7 mL of 5 M HCl. Afterward, the Sr fraction was stripped with 3.5 mL of 5 M HCl. Finally, the Sr fraction was evaporated to dryness and was ready for TIMS analysis. The whole procedure blank was lower than 300 pg for Sr. The Sr isotopic measurements were performed on a Finnigan MAT262 TIMS at the Institute of Geology and Geophysics, Chinese Academy of Sciences (IGGCAS).

4 Petrological characteristics of stromatolitic dolomites

4.1 Field characteristics and sedimentary microfacies

The stromatolitic dolomites are distributed throughout the Middle Cambrian Awatage Formation and the Upper Cambrian Qiulitage Formation. The Penglaiba section was divided into 227 sequences for the Cambrian strata and 147 sequences for the Awatage and Qiulitage formations.

The outcrops are composed of mostly khaki to brick red stromatolitic dolomites with some light gray stromatolitic dolomites. The

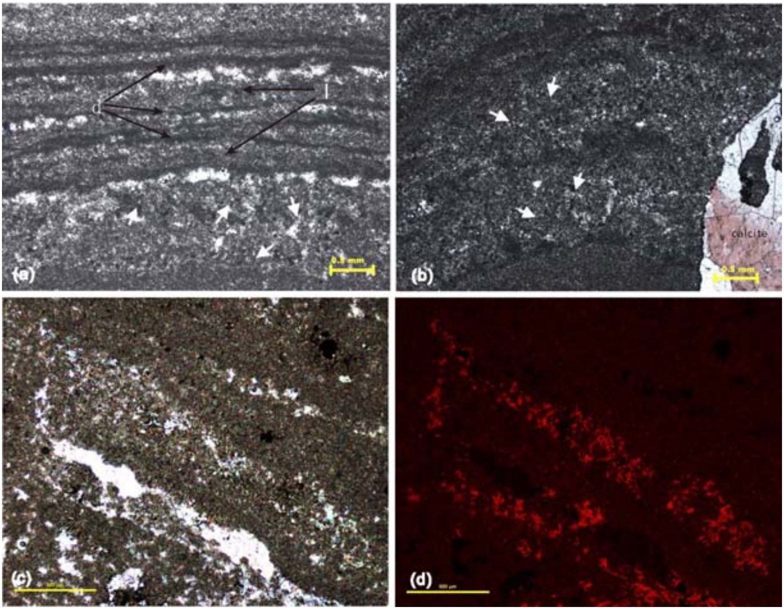


Figure 3. Photomicrographs illustrating the characteristics of stromatolites(a)Stromatolitic laminae consist of alternating layers of dark laminae «d» and light laminae «l» and pustules and dark spherical aggregates (white arrows); (b) Closed pustules and dark spherical aggregates (white arrows), and sparry calcite in right formed in late diagenesis; (c)(d): Fabric-preserving dark micrites in microscopy. The same area is uniformly very dull or non-luminescent.

morphologies of the stromatolites are characterized by low-relief planar-domal laminations, but some exhibit dome-like morphologies. The maximum thickness of the monolayers of the stromatolites is 91 cm. The stromatolite sequences extend in a stable manner.

The stromatolitic dolomites in the Awatage Formation are associated with sheet bedding 10 cm to 50 cm thick. These dolomites are micritic types characterized by frequent subaerial exposure surfaces, anhydrite nodules, or gypsum pseudomorphs. The sheet bedding is composed of anhydrite and single bedding is 5 mm to 50 mm thick. Aggregated anhydrite nodules or gypsum pseudomorphs (2 mm to 20 mm) are distributed in laminated micritic dolomites. These features indicate that the stromatolitic dolomites in the Awatage Formation are deposited in evaporated tidal flats or Sabkhas (Zhu *et al.*, 2008).

In the Qiulitage Formation, the stromatolites are found in the lower portion of the area, particularly near the boundary between the Awatage and Qiulitage formations. These stromatolites are filled with low-relief planar-domal laminations and domes (Figure 2(b), (c) and (d)). In meter-scale cycles, packstone dolomites are from

Sample No.	$^{87}Sr/^{86}Sr$	Error (2σ)
awT-1 Dark	0.709091	0.000011
awT-1 light	0.09085	0.000012
awT-2 rich in iron	0.709220	0.000011
xq-1	0.708910	0.000012
xq-2	0.709102	0.000012
xq-3	0.708783	0.000012
xq-4 dark	0.708992	0.000013
xq-4light	0.709055	0.000015
xq-5 dark	0.709342	0.000015
xq-5light	0.709159	0.000013
Q3-4 dark	0.709110	0.000012
NBS987	**0.710226**	**0.000012**
NBS987	0.710279	0.000013

Table 1. Strontium isotopic values of stromatolitic dolomite from the Middle and Upper Cambrian in the Penglaiba section, the Keping area, northwestern Tarim Basin (NW China).

limestones, which were characterized by high energy and were deposited in beach environments (Zhu *et al.*, 2008). Therefore, the stromatolitic dolomites in the Qiulitage Formation were formed by frequent sea-level fluctuations from tidal flats to beach environments (Zhu *et al.*, 2008).

4.2 Microscopic characteristics and distribution of organic matter

The crystals in the well-laminated and micritic dolomites in the stromatolites have a diameter of less than 0.03 mm. Dense laminations are stacked as stromatolitic laminae (Figure 3(a)). Laminae are usually isopachous, even and smooth, and vary from 0.1 mm to 0.5 mm in thickness. Stromatolitic laminae consist of alternating layers of dark laminae (d in Figure 3(a)) and light laminae (l in Figure 3(a)). Light laminae, which have a thickness of 120 ìm to 440 ìm, are microspar dominated by large fabric-preserving planar subhedral to euhedral dolomite crystals. Assessment by Alizarin red staining indicates that almost all the samples are dominated by dolomites and minimal calcites, and are composed of macrospar that filled the cavity structures during late-stage formation (Figure 3(b)). X-ray diffraction (XRD) patterns show that dolomite minerals account for more than 96% of sample composition, and calcites account for less than 4%. Further observations show the presence of obvious pustules and dark spherical aggregates in the stromatolitic laminae (white arrows in Figure 3), which are primarily dark laminae. Fabric-preserving dark micrites are uniformly very dull or non-luminescent (Figure 3(c) and (d)).

4.3 Dolomitic microstructure

The SEM photomicrographs reveal the presence of various morphologies associated with dark micritic laminae (Fig. 4). Notably, uniform dumbbell-shaped aggregates, approximately 550 nm in diameter, are enclosed within the dolomite crystals (Fig. 4A). These are usually composed of

The labeled peak at 2.15 KeV corresponds to a gold peak from the coating.

4.4 Strontium isotopes

Strontium isotopes measured in dolomite are shown in Table 1. Strontium ranged from 0.708783 to 0.709342.

5 Discussion

In the environment where

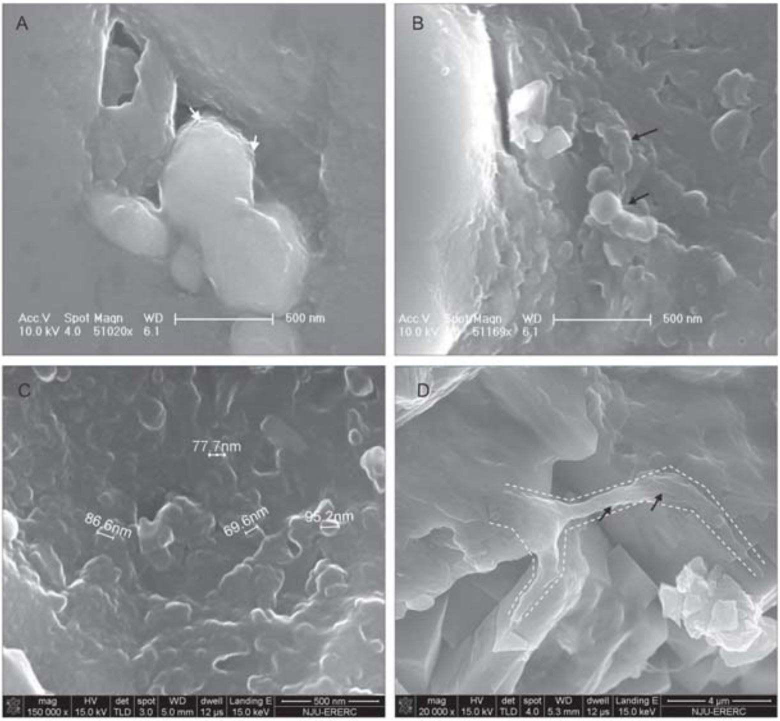
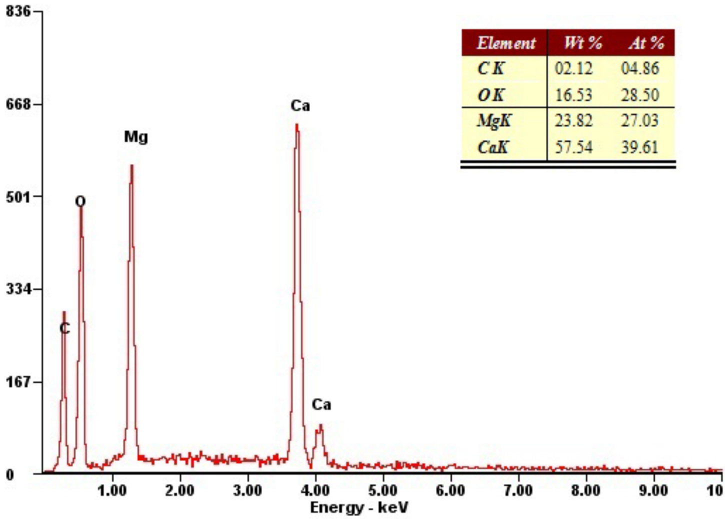


Figure 4. SEM photomicrographs illustrating the characteristics of sub-micrometre dolomite. (A) Two uniform spheroids with a diameter of ~ 550 nm (white arrows), consisting of many nano-particles ranging in size from 50 to 100 nm (black arrows). (B) Chain of spheroids with individual spheroid diameters of 50 to 100 nm that protrude from spheroid matrix (black arrows). (C) Spheroidal structures forming aggregates ranging in diameter from 50 to 100 nm protruding from spheroid matrix (black arrows). (D) Sub-polygonal and euhedral dolomite crystals connected by irregular filamentous textured materials (black arrows).

stromatolites to grow, one would expect to find aerobic photosynthetic bacteria, and the observed nanocrystal morphology in Cambrian dolomitic stromatolites (Fig. 4A-C) strongly resembles nanoglobules attached to the surface of *Halomonas meridiana* cells - a moderately halophilic aerobic strain of bacteria (Sánchez-Román *et al.*, 2008). Although such structures are also very similar to those reported from cultivation experiments using alkaliphilic sulfate-reducing bacteria (Aloisi *et al.*, 2006; Bontognali *et al.*, 2008), the absence of sulfate reduction is suggested by the absence of pyrite. In addition, the distribution of aggregates of 50 to 100 nm diameter nanocrystals in our samples was the same as those reported by



Element	Wt %	At %
CK	02.12	04.86
OK	16.53	28.50
MgK	23.82	27.03
CaK	57.54	39.61

Figure 5. EDS spectrum showing a typical composition of the dolomite crystals in Figure 4.

Sánchez-Román *et al.* (2008). The nucleation of dolomite on organic substrates has been documented to be of crucial importance in experimental investigations (van Lith *et al.*, 2003a; Bontognali *et al.*, 2008, 2010) and could result from the presence of specific functional groups including carboxylic acids (R–COOH), hydroxyl groups (R–OH), amino groups ($R{-}NH_2$), sulfate- ($R{-}O{-}SO_3H$), sulfonate- ($R{-}SO_3H$) and sulfhydryl groups (–SH), which can bond with metal ions, including Ca^{2+} and Mg^{2+} (Bianchi, 2007). In addition, through abiotic processes, alteration of extracellular polymeric substances (EPS) yields reorganization of acidic sites in templates, allowing carbonate precipitation (Dupraz and Visscher, 2005) or the sorption of polysaccharides on Ca–Mg carbonate surfaces (Zhang *et al.*, 2012). Relatively high aqueous Mg and low Fe (± Ca) concentrations may facilitate the incorporation of Mg in the solid (Romanek *et al.*, 2009). The observed organic matter preserved in dolomite (Fig. 4D) may have provided a stable mineralized surface and the geochemical conditions necessary for the subsequent development of dolomite crystals. In general, the presence of aerobic bacteria or the effect of organic substrates in lowering the activation energy of nucleation may be a viable mechanism leading to dolomite precipitation under Earth surface conditions and sulfate reduction might not be necessary for dolomite precipitation.

The seawater $^{87}Sr/^{86}Sr$ values are controlled mainly by the Sr fluxes to the ocean from continental weathering and by hydrothermal fluid /rock interaction at mid-ocean ridges (Palmer and Edmond, 1989). The $^{87}Sr/^{86}Sr$ composition of the volumetrically smaller seafloor hydrothermal flux is buffered at low values of ca. 0.703 to 0.705. In contrast, the continental weathering, via riverine and groundwater fluxes, contributes Sr with relatively high $^{87}Sr/^{86}Sr$ values (0.709~0.730) to the ocean (Palmer and Edmond, 1989). The $^{87}Sr/^{86}Sr$ data of the Cambrian were published (Derry *et al*., 1994; Montañez *et al*., 2000) from the same section (Wang *et al*., 2011). In particular, the decrease in $^{87}Sr/^{86}Sr$ ratios near the Series 2-Series 3 boundary is consistent with the ROECE event described by Wang *et al.* (2011). The $^{87}Sr/^{86}Sr$ ratios from this study are near to seawater composition, consistent with the palaeo sedimentary facies in the middle and upper Cambrian. In addition, the $^{87}Sr/^{86}Sr$ ratios increase stably from 0.708783 at the base of the Qiulitage Formation to 0.70911 in the uppermost Qiulitage Formation.

6 Conclusions

In conclusion, our study of Cambrian dolomitic stromatolites demonstrates the potential for preservation of original structures, textures and geochemical signatures of biogenic dolomite. Furthermore, the organic groups can bind different ions, including Mg^{2+}, among others, or weaken the chemical bonding between surface Mg^{2+} ions and water molecules, which probably promoted the formation of dolomite crystals. The dolomite consists of nanospheroidal aggregates associated with dark micritic laminae that are very similar to those seen in culture experiments and in some modern dolomite-producing microbial mats with active bacterial communities, biofilm and EPS. Our study confirms that microbial imprints can be preserved in the geological record, and validates their use as biomarkers. Furthermore, organic substrates may have formed the template for the precipitation of dolomite. The $^{87}Sr/^{86}Sr$ ratios from this study are near to seawater composition consistent with the palaeo sedimentary facies in the middle and upper Cambrian.

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Xuelian YOU
School of Ocean Sciences, China University of Geosciences, Beijing, China
Institute of Geology and Geophysics, Chinese Academy of Sciences, Beijing, China
Max-Planck Institute for Marine Microbiology, Bremen, Germany
youxuelian007@gmail.com

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- To establish how environmental changes have affected humans, how they responded and how they recovered if they did, by studying the past.
- To foster research on fast lake level changes based with strong chronological controls.
- To present the end users with a larger and more complete picture of possible future changes by highlighting how fast lakes have changed in any region. This will help in preparing better mitigating measures.
- Impact on population around the lakes now and in the historical/archaeological past,
- Ecological and environmental impacts of the lake level changes.

Call for papers open: 15 February 2014
Abstract submission deadline: 15 June 2014
Notification of acceptance: 30 June 2014
Lectures in Ankara: 15-16 September 2014
Fieldtrip around Konya: 17-19 September 2014

Abstract submission, Information & Accommodation

quicklakeh2014.kuvaterner.org
quicklakeh2014@kuvaterner.org
www.brunel.ac.uk/ife/meetings/quicklakeh
www.kuvaterner.org

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Special IAS Grants or 'Institutional IAS Grants'

Special IAS Grants or Institutional IAS Grants are meant for capacity building in 3rd world countries. There exists a list of 'Least Developed Countries' (LDC) by the UN. This list categorizes countries according to income per capita and is yearly updated.

Grants are allocated to allow Geology Departments in LDC to acquire durable sedimentological equipment for teaching and research (like sieves, calcimeters, auger drilling tools, etc.) or tools that can be used by all geology students (like general geology/sedimentology textbooks, IAS Special Publications (SP), memory sticks with back issues of Sedimentology or SP, etc). Therefore the grant application should clearly demonstrate to increase the recipient's capacity to teach sedimentology at the undergraduate level (Bachelor) in a durable way. It should also indicate in what way it would enable to support sedimentological research at the graduate level (Master).

Applicants should have a permanent position at their University and should be IAS members. Applications should provide the following information (not exhaustive list):

- the mission statement of the University/Geology Department
- the approval of the University Authorities to accept the grant
- a list of permanent teaching and technical staff members of the Geology Department (with indication of their area of research)
- the structure of the geology undergraduate and graduate courses (Bachelor/Master programme with indication of courses and theoretical and practical lecture hours)
- the number of geology students
- the actual facilities for geology/sedimentology students
- a motivation of application
- a budget with justification
- the CV of the applicant, including a sedimentology research plan

The institutional grant scheme consists each year of 2 sessions of 1 grant of 10.000 Euro. Applications run in parallel with the PhD research grant scheme (same deadline for application and recipient notification). The IAS Grant Committee will seek recommendations from relevant National Correspondents and Council Members (eventually including visitation) before advising the IAS Bureau for final decision. Additional funds made available by the recipient's University are considered as a plus.

Items listed in the application will be bought through the Office of the IAS Treasurer and shipped to the successful applicant. By no means will money be transferred to the grant recipient.

IAS STUDENT GRANT APPLICATION GUIDELINES

Application

The application should be concise and informative, and contains the following information (limit your application to 1250 words max.):

- Research proposal (including Introduction, Proposal, Motivation and Methods, Facilities) – max. 750 words
- Bibliography – max. 125 words
- Budget – max. 125 words
- Curriculum Vitae – max. 250 words

Your research proposal must be submitted via the Postgraduate Grant Scheme application form on the IAS website before the application deadline. The form contains additional assistance details for completing the request. Please read carefully all instructions before completing and submitting your application. Prepare your application in 'Word' and use 'Word count' before pasting your application in the appropriate fields.

Recommendation letter (by e-mail) from the PhD supervisor supporting the applicant is mandatory, as well as recommendation letter (by e-mail also) from the Head of Department/ Laboratory of guest institution in case of laboratory visit.

Please make sure to adequately answer all questions.

Deadlines and notifications

Application deadline 1st session: 31 March.

Application deadline 2nd session: 30 September.

Recipient notification 1st session: before 30 June.

Recipient notification 2nd session: before 31 December.

NOTE: Students who got a grant in a past session need to wait 2 sessions (1 year) before submitting a Postgraduate Grant Scheme grant application again. Students whose application was rejected in one session can apply again after the notification deadline of the rejected grant application

Guidelines for recommendation letter from supervisor:

The recommendation letter from the supervisor should provide an evaluation of the capability of the applicant to carry out the proposed research, the significance and necessity of the research, and reasonableness of the budget request.

The recommendation letter must be sent directly to the Treasurer of the IAS by e-mail, and before the application deadline.

It is the responsibility of the applicant to make sure that his/her supervisor submits the recommendation letter in time. No reminders will be sent by IAS, neither to the applicant, nor to the supervisor. Applications without letter of support will be rejected.

Application Form

Research Proposal (max. 750 words)

Title: ....

Introduction (max. 250 words): .....

Introduce briefly the subject of your PhD and provide relevant background information; summarise previous work by you or others (provide max. 5 relevant references, to be detailed in the 'Bibliography' field). Provide the context for your PhD study in terms of geography, geology, and/or scientific discipline.

Proposal (max. 250 words): ...

Describe clearly your researchproposal and indicate in what way your proposal will contribute to the successful achievement of your PhD. Your application should have a clearly written hypothesis or a well-explained research problem of geologic significance. It should explain why it is important. Simply collecting data without an objective is not considered wise use of resources.

Methods (max. 125 words): ....

Outline the research strategy (methods) that you plan to use to solve the problem in the field and/or in the laboratory. Please include information on data collection, data analyses, and data interpretation. Justify why you need to undertake this research.

Facilities (max. 125 words): ....

Briefly list research and study facilities available to you, such as field and laboratory equipment, computers, library.

Bibliography (max. 125 words)

Provide a list of 5 key publications that are relevant to your proposed research, listed in your 'Introduction'. The list should show that you have done adequate background research on your project and are assured that your methodology is solid and the project has not been done already. Limit your bibliography to the essential references. Each publication should be preceded by a '*'-character (e.g. *Surlyk et al., Sedimentology 42, 323-354, 1995).

Budget (max. 125 words)

Provide a brief summary of the total cost of the research. Clearly indicate the amount (in Euro) being requested. State specifically what the IAS grant funds will be used for. Please list only expenses to be covered by the IAS grant.

The IAS will support field activities (to collect data and samples, etc.) and laboratory activities/analyses. Laboratory activities/analyses that consist of training by performing the activities/analyses yourself will be considered a plus for your application as they will contribute to your formation and to the capacity building of your home institution. In this case, the agreement of the Head of your Guest Department/Laboratory will be solicited by automated e-mail.

Curriculum Vitae (max. 250 words)

Name, postal address, e-mail address, university education (degrees & dates), work experience, awards and scholarships (max. 5, considered to be representative), independent research projects, citations of your abstracts and publications (max. 5, considered to be representative).

Advise of Supervisor and Head of Guest Department/Laboratory

When you apply for a grant, your PhD supervisor will receive an automated e-mail with a request to send the IAS a letter of recommendation by e-mail. You should, however, check with your supervisor everything is carried out the way it should be. It will be considered as a plus for your application if your PhD supervisor is also a member of IAS.

Supervisor's name: ....

Supervisor's e-mail: ....

If you apply for laboratory analyses/ activities, please carefully check analysis prices and compare charges of various academic and private laboratories as prices per unit might differ considerably. Please first check whether analyses can be performed within your own University. If your University is not in a position to provide you with the adequate analysis tools, visiting another lab to conduct the analyses yourself strengthens your application considerably as it contributes to your formation and to capacity building of your home University. Please check with the Head of Department/ Laboratory of your guest lab to assure its assistance during your visit. You should fill in his/her name and e-mail address to solicit his/her advise about your visit.

Name of Head of guest Department/ Laboratory: ....

E-mail address of Head of Guest Department/Laboratory: ....

Finally, before submitting your application, you will be asked to answer a few informative questions by ticking the appropriate boxes.

- is your supervisor a member of IAS
- was this application your own initiative
- did you discuss your application with your Supervisor
- did you already had contact in the past with the Head of the Guest Department/Laboratory (if appropriate)

CALENDAR

AGU 2014 Fall Meeting*

15th -19th December 2014
San Francisco,
USA

http://fallmeeting.agu.org/2014/

6th International Symposium on Lithographic Limestone and Plattenkalk*

15th -19th September 2014
Museo del Desierto,
Saltillo,
Mexico

Christina Ifrim
ISLLP2014@geow.uni-heidelberg.de
http://isllpsaltillo.uni-hd.de

«Are there limits to evolution?»

25th -26th September
Cambridge
UK

http://wserv4.esc.cam.ac.uk/atle/

Interim Colloquium of the Regional Committee of Neogene Stratigraphy (RCMNS)*

25th-28th September 2014
Torino
Italy

Francesco De La Pierre
Francesco.delapierre@unito.it
www.rcmns-turin2014.weebly.com

Workshop - Field Trip «Sedimentary carbonate and reservoir systems»*

26th -29th September 2014
Tirana
Albania

Rudy Swennen
Rudy.Swennen@ees.kuleuven.be
www.cbga2014.org/workshops.html

4th International Palaeontological Congress (Mendoza, Argentina)*

28th September-3rd October 2014
Mendoza
Argentina,

Cecilia Benavente
cebenavente@gmail.com
www.ipc4mendoza2014.org.ar

Applied Ichnology and Sedimentology Short Course

29th September – 1st October 2014
Utrecht
The Netherlands

Herman Darman
Herman.Darman@shell.com
http://www.kngmg.nl/evenementen/2014aapg-ichnology-course.pdf

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5th International MAAR Conference*

17th -21st November 2014
Querétaro
Mexico

Gerardo Carrasco Nuñez
gerardoc@dragon.geociencias.unam.mx

Quadrennial International Limnogeology Congress (ILIC6)*

15th -19th June
2015
Reno
Nevada

Michael Rosen
mrosen@usgs.gov

First International Congress on Continental Ichnology (ICCI-2015)*

21th – 27th April
2015
El Jadida
Morocco

Abdelouahed Lagnaoui
abdelouahedlagnaoui@yahoo.fr

15th Bathurst Meeting of Carbonate Sedimentologists*

13th-16th July
2014
Edinburgh,
UK

Rachel Wood
Rachel.Wood@ed.ac.uk

5th International Conference on Alluvial Fans*

29th November – 4th December
2015
Christchurch
New Zealand

James Driscoll
james.driscoll@monash.edu

*** THESE EVENTS HAVE FULL OR PARTIAL IAS SPONSORSHIP**

INTERNATIONAL ASSOCIATION OF SEDIMENTOLOGISTS
www.sedimentologists.org

This Newsletter has been designed by
Proedex s.l. Francisco Silvela 27
28028 Madrid, Spain
editorial@proedex.com

Contributions to be sent to:

Vincenzo Pascucci
IAS General Secretary
Department of Architecture,
Design and Planning,
University of Sassari,
sede di Via Piandanna 4,
07100 Sassari, Italy
Tel.: +39 079228685
pascucci@uniss.it

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