

EUROPEAN REGION NEWSLETTER

Unlocking the Future

April 2013, Vol. 8

<http://europe.aapg.org/>

<http://www.aapg.org/europe/newsletters/index.cfm>

TABLE OF CONTENTS

President's Message	1
R&D Projects	2
Exploring the Potential For Biogenic Methane Formation	2
Geology Focus	4
"Jurassic Coast" Studies Centre	4
Conferences and Seminars	7
Student Chapter & IBA	11
AAPG-ER News	14
AAPG-ER Structure	17

EDITORIAL BOARD

Karen Wagner, Chief Editor
 James Bailey, Coordinator
 David Contreras, Coordinator
 William Sassi, Coordinator

AAPG European Region Council

Vlastimila Dvořáková, *President*
 Keith Gerdes, *President-Elect*
 Helen Cromie, *Secretary*
 Knut Henrik Jakobsson, *Treasurer*
 Andrea Moscarillo, *AAPG Advisory Council*
 David R. Cook, *Active Past-President*

The AAPG European Region Newsletter is published quarterly by the American Association of Petroleum Geologists - European Region, 1st Floor, 56 Brewer Street, London W1F 9TJ, Phone: +44 (0) 2074341399. The months of issue are March, June, September and December.

Instructions to authors

Editorial correspondence and material submitted for publication should be addressed to the Editor to kwag@statoil.com. All materials should be sent by the 15th of the month before issue publication. All submissions are subject to editorial review and revision.

Subscriptions

Subscription to this publication is included in the membership dues.

Advertising pricing and size

The Newsletter is printed digitally. Advertising is accepted on a space-available basis. Deadline for submitting material is 15th of the month before issue publication.

Advertisement Page Size	Actual size	Front page cost	Random inside cost
Eighth	27.75 x 21.8	\$50	\$25
Quarter	55.5 x 43	\$75	435
Half	111 x 87.5	Not applicable	\$75
Full	222 x 175	Not applicable	\$100

PRESIDENT'S MESSAGE



Dear Reader,

We have been pretty busy here since our last time back in December. We could not wait to have the first spring warm sun coming up to break finally a long and cold winter this year in many parts of the Europe and not only in the so called „Cold North“. Covered by snow even in Central and Eastern Europe, and also including some parts of UK, France and Italy till the very last days in March. Our trip to attend the ER AAPG conference in Barcelona came as the really first touch of spring for many of us. What a treat! This is also why we are a bit late this year coming up with the first Newsletter of this year. But the term NEWSletter was the priority enabling us to tell you fresh from the press more about the APPEX in London, the IBA in Europe and the Barcelona conference.

The conference in Barcelona entitled, "Exploring the Mediterranean; New Concepts in an Ancient Seaway" consisted of three full days of technical sessions with two field trips to key geological locations in the region. The conference was as usual well attended by close to 400 participants from the oil industry, academia and students from all over Europe and due to the theme also by colleagues from the Middle East Region. A successful conference such as this is once again the result of the hard work and skills of our full time AAPG staff from London and AAPG members who volunteered their time the committees. You can read more about the technical sessions in this issue written by Keith Gerdes, President Elect ER AAPG and Nuno Pimentel describing the post conference field trip through the old and new exploration paradigms at the Gulf of Valencia.

Going back to mid March, nineteen university teams from eleven countries assembled at the Albion Hotel in Prague on 21st to 23rd March in order to take part in the Imperial Barrel Award competition. This is the sixth year that a European Region semi-final has been held and seven years since the AAPG initiated the program. The team from Manchester University (UK) has won the 2013 AAPG European Region Imperial Barrel Award semi-final and will go forward to the Annual Convention in Pittsburgh to compete in the Global Final with teams from the other AAPG Regions and Sections. To read more about IBA competition follow the story written by David Cook, Past President ER AAPG and IBA Committee Co-Chair.

The Executive Committee of AAPG voted eventually at its February 6 meeting to recommend to the HoD a change in the boundary between AAPG's Asia Pacific and European regions. According to the motion, the countries of Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan would be transferred to the European Region. This change was requested by Asia Pacific Region President Peter Baillie and European

serve members in these Central Asian nations. Before the EC vote, the AAPG Executive Director contacted the one affiliated society that would be affected by this change, the Association of Petroleum Geologists of Kazakhstan and their President responded positively in writing that the APGK supports the proposed modification. All of the delegates including the ER will vote at HoD meeting during ACE in Pittsburgh in mid May.

During the upcoming ACE Award Ceremony in Pittsburgh some of our colleagues and members of ER AAPG will be honored by AAPG Awards. Our congratulation goes to Dietrich H. Welte who will receive the highest AAPG Award – Sidney Powers Memorial Award. The Grover E. Murray Memorial Distinguished Educator Award goes to John R. Underhill from the University of Edinburgh and finally the Wallace E. Pratt Memorial Award presented to honor and reward the authors of the best AAPG Bulletin article published in 2012 will be given to Andrew C. Aplin and Joe H. Macquaker. For those who will attend the Pittsburgh conference join us to celebrate our ER honorees.

The Geology Focus article this time is written by Marcus Dixon and describes a new project for a „Jurassic Coast“ Studies Centre aimed to inspire future generations of Earth scientists by boosting field geology. The spectacular cliffs of England's 'Jurassic Coast' UNESCO World Heritage Site face some extremely exciting plans for the establishment of an exemplary educational facility and research centre for professionals, amateurs as well as the public. Developed in partnership with the Natural History Museum in London, the UK Field Studies Council and a wide partnership of universities and science organisations, AAPG members are invited for sponsorships.

The R&D article covers biogenic methane formation and is coming from our colleagues at the GfZ in Potsdam, Germany and includes very interesting case studies.

Very soon you will get our next Election roster to vote for the position of President Elect and Treasurer as well as new delegates of HoD (21 candidates for 15 vacant seats). Some of you already expressed your interest to serve and you will be on the list. Along with some of you we have Jonathan Craig (Eni, Italy) and Gabor Tari (OMV, Austria) standing for President Elect and Knut Jakobsson (NPD, Norway) and Charles Speh (Milestone, UK) being nominated for position of Treasurer. I encourage you to vote and select the best candidate you wish to serve ER AAPG in the coming period of time. As you can imagine it is quite difficult to find members willing to run for high office as well as very often we find those serving longer experience "burn out". But to be on optimistic side many exciting things we can do are still waiting ... also waiting to be done by you if you are willing and interested to help and serve the European Region of the AAPG.

Enjoy the spring season and I hope to see you in Pittsburgh or at some other place elsewhere across Europe ...

...and remember to vote, always something you have in your hands or let's say don't miss your chance for a change!

Vlastimila Dvořáková
AAPG European Region President

Exploring The Potential For Biogenic Methane Formation Using Hydrogeochemical Thermodynamics

By Hans-Martin Schulz*¹, Wolfgang van Berk** and Esther T. Arning*

*Helmholtz Centre Potsdam - GFZ German Research Centre for Geosciences

**Technical University of Clausthal

1. Corresponding author: schulzhm@gfz-potsdam.de

INTRODUCTION

In Europe biogenic gas is being produced from several major gas fields in, for example, the Molasse Basin of Austria and the Po Basin of Italy, and the recently discovered Eastern Mediterranean Tamar gas field off Israel is argued to be also partly filled with biogenic methane.

The latter discovery offers encouragement for further exploration success in similar settings, but which have been underestimated up to now.

BIOGENIC METHANE PREDICTION: LEARNING FROM MARINE GEOLOGY

To investigate biogenic methane potential, a different petroleum system analysis is required than for thermogenic gas fields. Considerations about early diagenetic processes are essential, and many numerical approaches have been published to explain the fate and behaviour of biogenic methane in young marine sediments. With the exception of some early models (e.g. Clayton, 2008), there has been a lack of numerical tools in the petroleum industry to predict the biogenic methane potential. This is due to the complexity of formation processes involved, geomechanical uncertainties of the overburden, and only few data about seal integrity at often shallow depths.

Interestingly, there is a wealth of complex high-resolution data sets from the IODP programme (the former ODP and DSDP), which provide not only important basic data for the retracing of biogenic methane formation in marine sediments, but also help in the design of new numerical tools for predicting biogenic methane potential in ancient rocks.

BIOGENIC METHANE FORMATION: MULTIPLE SOURCES, MULTIPLE PROCESSES

Early diagenetic methane formation is a common process in organic matter-rich sediments both in marine and terrestrial settings. Under suitable conditions, biogenic methane released en-masse from TOC-rich sediments may be trapped in sedimentary basins and form commercial accumulations.

As sediments accumulate in marine settings the methanogenic zone is rapidly reached after sulfate is exhausted. In simple terms, methanogenic microbes use the refractory organic matter for conversion and, in addition to carbon dioxide, methane is generated. The later diagenetic fate and behaviour of methane depends on the hydrogeochemical and lithological conditions in a sedimentary basin. Methane can be dissolved in the pore water, it may exsolve at saturation, and may occur in a solid state as hydrate. Diffusion of methane and/or contact to dissolved sulfate can lead to anaerobic methane oxidation (AOM). This process prevents large methane exhalations into the overlying water column. Consequently, the preservation of such early formed methane at shallow depth is mainly controlled by the sedimentation rate and water depth, which may lead to the trapping of methane in the form of hydrate. Thus, methane can be trapped over geological time scales until rising temperatures linked with continuing burial again leads to the dissolution of hydrate and the filling of adjacent porosity, provided that impermeable and thick shale units acting as seals prevent further migration and leakage. Scenarios similar to this were operative when the large biogenic methane gas fields in the Upper Austrian Molasse basin were charged (Schulz and van Berk, 2009).

As further calibration, laboratory experiments have shown that methanogenic bacteria are most productive best at temperatures around 40 °C (Zeikus and Winfrey, 1976). Additionally, oil degradation in subsurface reservoirs, operative up to 80 °C, is a further process which leads to biogenic methane formation. Fig. 1 summarizes the different processes dependent on burial depth and thermal maturation.

Besides these conventional scenarios, biogenic methane is also successfully produced from unconventional plays such as gas shales. The production success of the Upper Devonian Antrim Shale in the Michigan Basin highlights that also geologically young biogenic methane formation is possible from relatively old organic matter (Formolo et al., 2008; Max and Johnson, 2012).

EARLY BIOGENIC METHANE FORMATION: A NEW QUANTITATIVE APPROACH

There is intense microbial life in surficial marine sediments, but the number of microbes decreases rapidly with depth (Lipp et al., 2008). This is due to rapidly developing oxygen- and oxidant-depleted conditions (such as less available dissolved nitrate and sulphate), and the lower availability of labile organic matter during methanogenesis. The availability of organic matter coupled to its irreversible redox-conversion in aqueous systems drives a sequence of interrelated and complex hydro and biogeochemical reactions, which are reflected by early diagenetic mineral precipitation/dissolution, gas formation and subsequent pore water compositional changes.

Biogenic methane formation

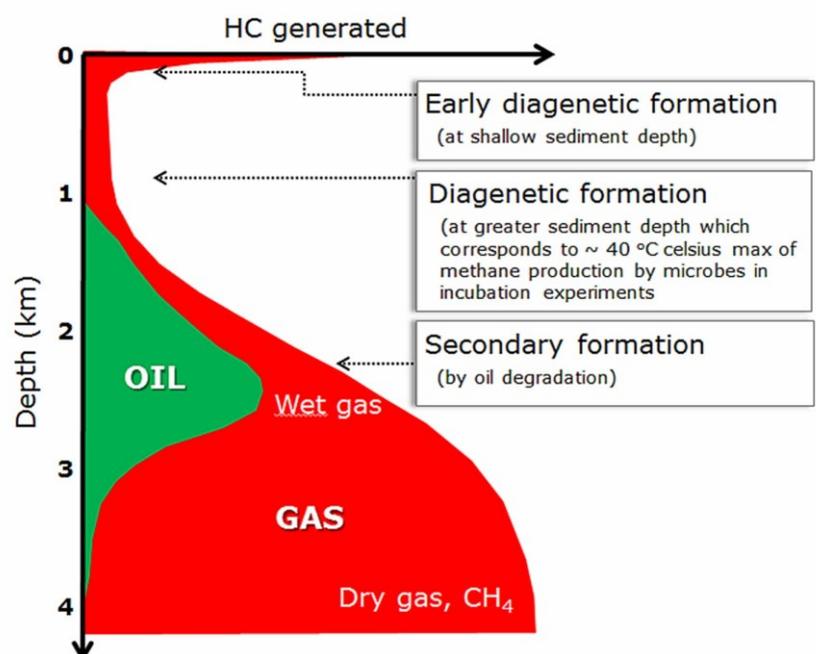


Fig. 1: Biogenic methane forms at different depth, different thermal maturities of the organic matter (dissolved in aqueous solution or as bitumen), and as result of different processes.

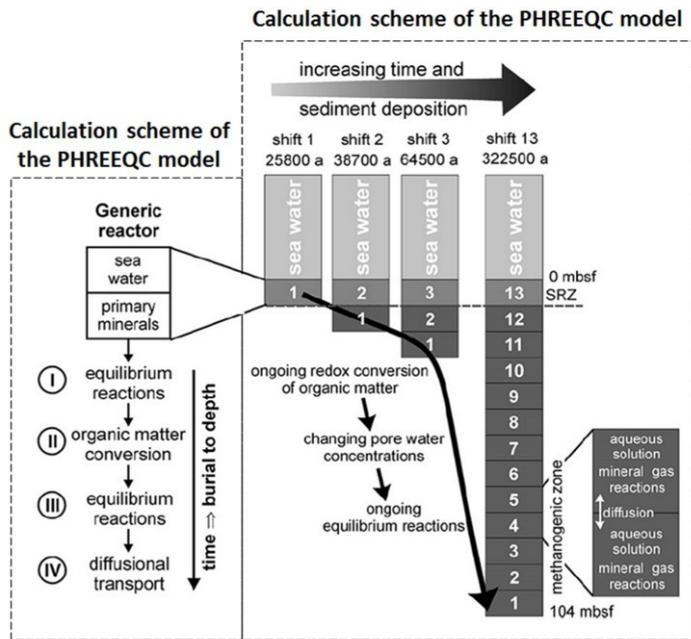


Fig. 2: (A) Calculation scheme of the PHREEQC model. (B) Concept of the PHREEQC model. Modified after Arning et al. (2011).

Sulfate reduction delivers bicarbonate and sulfide to the system until sulfate is exhausted. Deeper methanogenesis via the CO₂ reduction pathway is often the dominant biogenic methane formation process in marine sediments. The products of early diagenetic reactions initiate coupled equilibrium reactions that induce a new state of chemical equilibrium. Such early diagenetic processes in marine sediments are complex and can be retraced and reproduced by hydrogeochemical mass transport models.

Conceptually, concurrent and interdependent reactions in an early diagenetic system can be best described by a modeling approach that is based on chemical equilibrium thermodynamics together with reaction kinetics, which considers all coupled reactions and the fundamental principles of mass and charge balance (Arning et al., 2011). The modeling tool is the PHREEQC computer code which is a freeware from the USGS.

The model concepts include a multi-process, multi-component, and multi-phase approach, and are based on chemical thermodynamics. The modeling

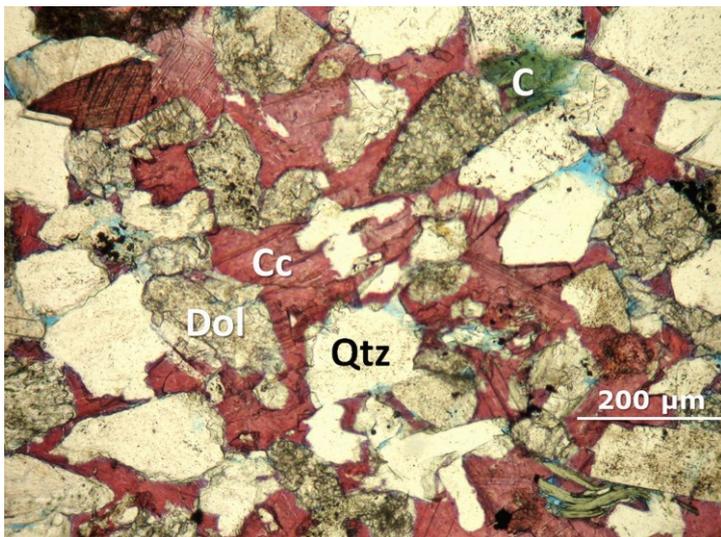


Fig. 3: Thin section of a reservoir interval of the Puchkirchen Formation in the Austrian Molasse basin. Abbreviations: Cc: calcite, Dol: dolomite, Qtz: quartz, C: chlorite. Porosity (blue).

concepts incorporate interdependent diagenetic reactions evolving into a diffusive mass transport system and are coupled to thermodynamic equilibrium calculations of species distribution. The reaction kinetics of organic carbon conversion is integrated into the set of equilibrium reactions by defining type and amount of converted organic matter at a given time step. The model set-up describes a growing sediment column. One-dimensional molecular diffusion of aqueous and gaseous species, compaction flow as well as burial of solids and aqueous species are considered (Fig. 2).

FROM SCIENCE TO APPLICATION: EXAMPLES FROM CASE STUDIES

The above mentioned concept was applied to the biogenic methane gas field Atzbach-Schwanenstadt in the Austrian Molasse Basin (Schulz et al., 2009; Schulz & van Berk, 2009).

Free gas phases developed during early diagenetic methanogenesis in the ca. 700 m thick Upper Puchkirchen Formation (Aquitanian), and may have been trapped as gas hydrate (water depth 1000 m, bottom water temperature of about 4 °C). Due to basin subsidence and high sedimentation rates in a deep-sea fan environment, hydrate decay below the base of the gas hydrate stability zone (200–400 mbsf) occurred already still in the Aquitanian and, thus, during or shortly after deposition of the

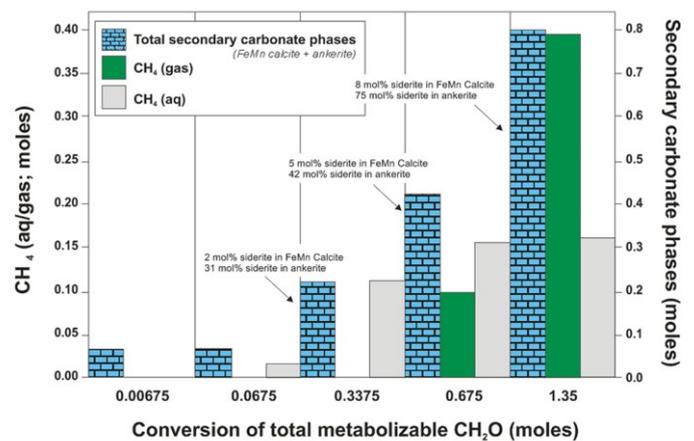


Fig. 4: Modelled secondary carbonate phase precipitation and methane generation (aq/gas) in dependence on the conversion of different contents of metabolizable organic matter CH₂O. Source: Modified after Schulz et al. (2009).

Upper Puchkirchen Fm. The results from this test site enabled the development of a first tool to retrace the biogenic methane potential by analysis of diagenetic cement as a quantitative indicator in a “closed” system (Figs. 3, 4). Additionally, water salinity and hydrochemistry of the gas field may be applied in similar architectural elements of deepwater channels as tracers for fossil gas hydrate formation, because low chloride concentrations was result from sediment compaction and dilution by pure H₂O in closed systems due to gas hydrate dissociation.

To verify such findings, hydrogeochemical properties of recent marine test sites with biogenic methane formation have to be retraced in order to calibrate signals like alkalinity, pH, distribution of dissolved, mineral, and gaseous species including methane hydrate formation. Three different settings (well site 1246 of ODP Leg 204, Hydrate Ridge; Amazon fan; Peruvian shelf) have been investigated (Arning et al., 2011, 2012, 2013), and reveal the importance of sedimentation rate and AOM for the fate and behaviour of early formed methane. Furthermore, the results of the three settings show that the formation of diagenetic carbonates is an important storage mechanism for carbon in sediments (Fig. 5).

Another geological feature for not only retracing methane formation, but also its prediction, is the application of these concepts to biogenic shale gas formation. The GASH project (Gas Shales in Europe) considered the

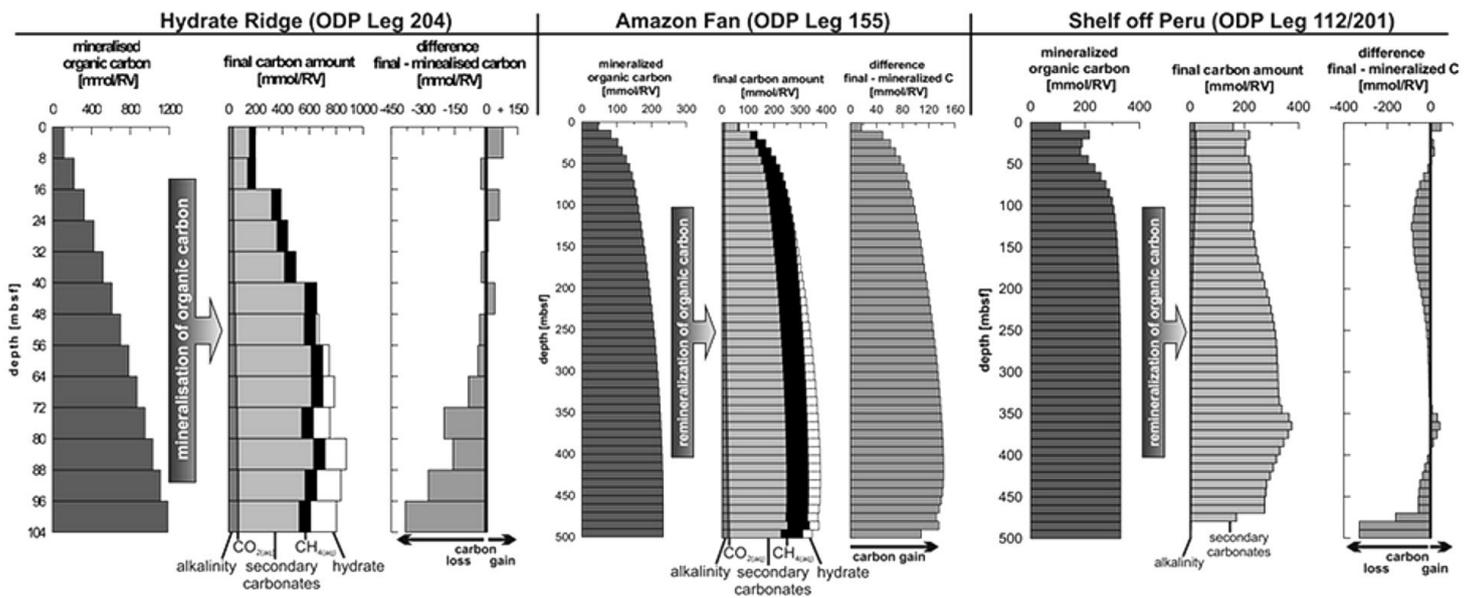


Fig. 5: Carbon mass balance calculations of test sites Hydrate Ridge (ODP Leg 204), Amazon Fan (ODP Leg 155), and Shelf off Peru (ODP Leg 112/201).

question of whether sediments, among other things, still today act as kitchen for biogenic methane formation, and which processes would occur during production.

Interestingly, methanogenic microbes are still capable of consuming the organic matter in marine black shales up to a thermal maturity of around 2 % vitrinite reflectance. These findings, from incubation experiments, indicate a shallow subsurface potential for biogenic methane. Infiltration of meteoric water may dilute the original total dissolved solids and may stimulate methanogenic microbes to "start their engine". Especially if oil window maturity prevails, organic compounds from the bitumen may dissolve in the pore water and can be converted to biogenic methane.

CONCLUSIONS

New concepts are being elaborated to numerically retrace the biogenic methane potential of marine sediments. These concepts are based on chemical thermodynamics and are also able to predict the biogenic methane phase behaviour as well as general gas composition, and coupled mineralogical changes. The application of the approach furthermore can help to predict early diagenetic processes in frontier regions.

ACKNOWLEDGEMENTS

Samples and data for our research were provided by the Ocean Drilling Program (ODP), by Rohoel Aufsuchungs AG, and Petrobras. Financial support was provided by our industrial partners Devon Energy, Petrobras, and Total (and further GASH sponsors). Furthermore, Brian Horsfield (GFZ Potsdam) supported our work financially.

BIBLIOGRAPHY

- Arning, E. T., van Berk, W., Vaz dos Santos Neto, E., Naumann, R., Schulz, H.-M., 2013. The quantification of methane formation in Amazon Fan sediments (ODP Leg 155, Site 938) by hydrogeochemical modeling solid – aqueous solution – gas interactions. *Journal of South American Earth Sciences*, 42, 205-215.
- Arning, E. T., van Berk, W., Schulz, H.-M., 2012. Quantitative geochemical modelling along a transect off Peru: Carbon cycling in time and space, and the triggering factors for carbon loss and storage. *Global Biogeochemical Cycles*, 26, 4.
- Arning, E. T.; Fu, Y.; van Berk, W.; Schulz, H.-M. (2011): Organic carbon remineralisation and complex, early diagenetic solid–aqueous solution–gas interactions: Case study ODP Leg 204, Site 1246 (Hydrate Ridge). *Marine Chemistry*, 126, 1-4, 120-131.
- Formolo, M. J., Petsch, S. T., Martini, A. M., & Nüsslein, K., 2008. A new model linking atmospheric methane sources to Pleistocene glaciation via methanogenesis in sedimentary basins. *Geology*, 36(2), 139–142.
- Johnson, A. H., Max, M. D., 2012. Could Gas Hydrate in Fine Grained Sediments be a Precursor for Some Shale Gas Deposits?, *AAPG Search and Discovery Article #90142*.
- Lipp, J., Morono, Y., Inagaki, F., Hinrichs, K.-U., 2008. Significant contribution of Archaea to extant biomass in marine subsurface sediments. *Nature* 454, 991-994.
- Max, M., Johnson, A. H., 2012. Could gas hydrate in fine-grained sediments be a precursor for some shale gas deposits? *Petroleum Geoscience* 18, 231-238.
- Schulz, H.-M., van Berk, W., Bechtel, A., Struck, U., Faber, E., 2009. Bacterial methane in the Atzbach-Schwanenstadt gas field (Upper Austrian Molasse Basin), Part I: Geology. *Marine and Petroleum Geology* 26(7), 1163-1179.
- Schulz, H.-M., van Berk, W., 2009. Bacterial methane in the Atzbach-Schwanenstadt gas field (upper Austrian Molasse Basin), Part II: Retracing gas generation and filling history by mass balancing of organic carbon conversion applying hydrogeochemical modelling. *Marine and Petroleum Geology* 26(7), 1180-1189.
- Zeikus, J. G., Winfrey, M. R., 1976. Temperature Limitation of Methanogenesis in Aquatic Sediments. *Applied and Environmental Microbiology* 31(1), 99-107.

‘Jurassic Coast’ Studies Centre
Inspiring future generations of earth scientists by boosting field geology

by Marcus Dixon



Figs.1&2 Google overview map and location map

Mesozoic history is spectacularly laid bare in the cliffs of England’s ‘Jurassic Coast’ UNESCO World Heritage Site.

The site runs for 95 miles along the south coast of England and is the only place on Earth which exhibits a near complete sequence of Triassic, Jurassic and Cretaceous rocks.

Inscribed to the World Heritage List in 2001, the Jurassic Coast is one of only 82 World Heritage Sites (<http://jurassiccoast.org/>) recognised for its internationally important rocks, fossils and landforms. The site stretches from the Triassic of Orcombe Point at Exmouth in Devon eastwards to the Cretaceous of Studland, Dorset, 95 miles (122km) away, and encompasses 185 million years of Earth’s history. For more than 300 years the area has been a crucible for learning, inspiring and enthusing generations of scientists about all aspects of the Earth Sciences. From the evolution of life to the formation of petroleum deposits, there is no better or more inspiring place to establish an international centre of excellence for outdoor learning about the natural sciences for all ages and all abilities.

Immediately to the east lies Wytch Farm, Western Europe’s largest known onshore oilfield (500 mio bbl). The field’s potential source rock, reservoir, seal and migration story are all there to be studied, but so is a great wealth of geology, palaeontology and geomorphology that has generated interest since the earliest days of the development of the Earth Sciences.

Exciting plans are underway to create a Studies Centre for the Jurassic Coast (www.jurassicstudycentre.co.uk). The Centre will be an exemplary educational facility and research centre for professionals, amateurs and the public. Developed in partnership with the Natural History Museum in London, the UK Field Studies Council and a wide partnership of Universities and science organisations, the aim is to inspire the next generation of earth scientists.

The Jurassic Coast Studies Centre will be a state-of-the-art 120 bed multi-use residential facility. It will accommodate laboratories, seminar and conference facilities, workshops, actual and virtual classrooms and an exhibition space. The centre will offer a wide range of courses delivered by many of the world’s leading experts including field trips along the Jurassic coast to showcase the geological and geomorphological history of the area. More specialist courses are planned with a focus on using the Jurassic Coast as an outdoor classroom to learn about petroleum systems. Bespoke courses for company professionals will be developed for corporate supporters of the Studies Centre.

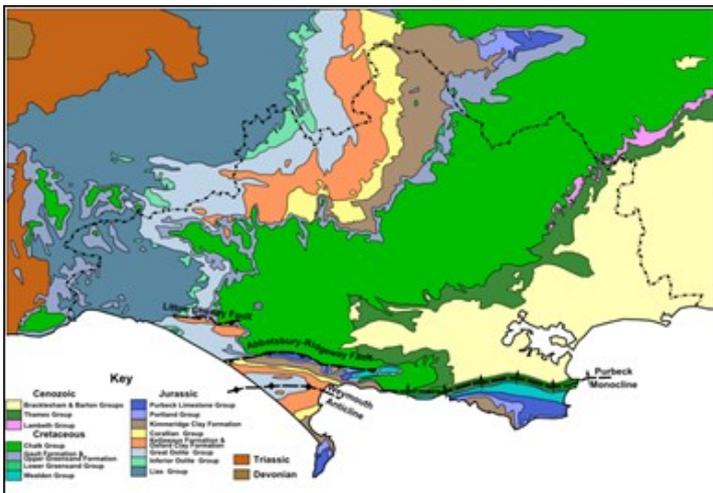


Fig. 3. Wikipedia geology map; more maps can be found here <http://www.southampton.ac.uk/~imw/Swanage-Ballard.htm>



Fig. 4 Coastal cliff view



Fig. 5 Chalk cliff (Upper Chalk mucronata zone)

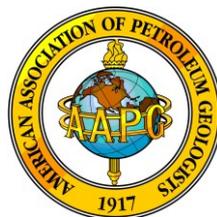


Fig. 6 Ichthyosaur

The petroleum and civil engineering oriented courses will focus on the complex challenges of managing natural resource extraction and civil engineering projects in unstable geological environments, which the Jurassic Coast exemplifies. Other courses will include taxonomy and environmental science.

The Studies Centre will provide expanded year-round access to the type of outstanding earth science related experiences that are currently offered to inquisitive children and adults at the famous annual Lyme Regis Fossil Festival. The Studies Centre will be located about halfway along the Jurassic

Coast in Lyme Regis; a small town with a big name renowned for its geological and paleontological heritage which includes the remarkable fossil hunter Mary Anning and her pivotal role in the birth of palaeontology. The project is led by the Lyme Regis Development Trust (a community enterprise organisation). The Jurassic Coast Studies Centre is a work in progress and Lyme Regis Development Trust would like to invite members of the AAPG to join the partnership team to make it a reality. Please contact Marcus Dixon, Director of the Lyme Regis Development Trust at Marcus@lrtdt.co.uk if you'd like to learn more.



**EUROPEAN
REGION**

HOW TO RECEIVE THE AAPG-ER NEWSLETTER

AAPG members are automatically associated with the Region that corresponds with their mailing address. For example, Rio de Janeiro mailing address will be assigned for purposes of AAPG mailings, etc. with the Latin American Region. To change this designation, a member need only contact AAPG Headquarters by email and request there the Region assignment on their membership record be changed.

Requests for this change are directed to Linda Burris at lbarris@aapg.org. ■



STUDENT
GEOSCIENTIFIC
SOCIETY

Geo.X



IGSC 2013

4th International Geosciences Student Conference
25-28 April 2013 | Berlin, Germany

Inspiring Change

www.IGSC-2013.com



Society of Exploration Geophysicists
The International Society of Applied Geophysics



EAGE

EUROPEAN
ASSOCIATION OF
GEOSCIENTISTS &
ENGINEERS

Technical Presentations | Short Courses | Workshops | Recruitment Exhibition
Icebreaker Reception | Conference Evening | Farewell Gala | Field Trips

**DATE FOR
YOUR DIARY**

Petroleum systems of the Paratethys: Exploring the Pathway from Europe to Asia

26-27 September 2013 / Tbilisi, Georgia

Co-chairs: Reinhard Sachsenhofer, Leoben University and Gabor Tari, OMV

AAPG Europe is proud to announce a Regional Conference scheduled to take place on **26-27 September 2013**. This ground-breaking event will take place in the wonderful city of Tbilisi in Georgia, located in the middle of what explorers call the Paratethys region of Central/Eastern Europe and Central Asia.

Recent years have seen a huge rise in E&P activities in regions which were previously underexplored and new frontiers for oil and gas exploration are opening up globally. This comes as a result of improved exploration technologies as well as geopolitical developments which have led to increased accessibility in some countries. Both of these factors apply to some parts of the Eastern Europe, the Former Soviet Union and Central Asia.

Regional and topical themes:

This conference will concentrate on the petroleum systems of the Paratethys from a hydrocarbon exploration and geoscience perspective. The geographic focus will be on the Pannonian, Black Sea, Caspian Sea basins and various Alpine folded belts and their foredeep/foreland basins in the same region including the Alps, Carpathians, Balkans, Pontides, Crimea and the Caucasus. There are many exploration topics which are unique to the Paratethys region which are captured in the session themes.

Who should attend?

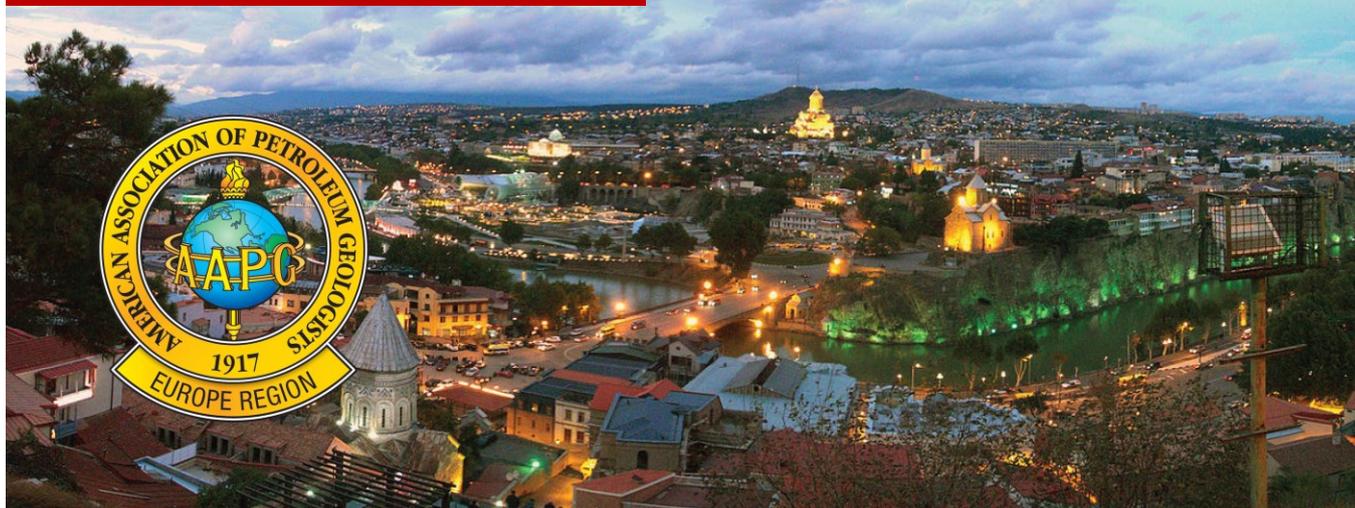
This event will be of interest to upstream oil and gas industry professionals exploring the broader area of Central/Eastern Europe and Asia. Participation by academic researchers and students with an interest in hydrocarbon exploration and regional geology is also most welcome.

Planned technical sessions

- 1) Petroleum systems of the Paratethys: what is proven and what is speculative?
- 2) The Maykop Formation and its equivalents in the Paratethys: a regional overview
- 3) Unconventional exploration targets in the Paratethys region
- 4) Sequence stratigraphy in the Paratethys and correlation issues with the global stages
- 5) Improving the stratigraphic resolution within the Paratethys
- 6) The signature of the Messinian sea-level drop in the Paratethys
- 7) Paleogeographic changes in the Paratethys related to the evolution of marine connections
- 8) Case studies of application of geochemistry and basin modelling in the Paratethys region
- 9) The folded belts of the Paratethys: case studies from the Alps to the Caucasus
- 10) Yet-to-find studies in various parts of the Paratethys

Deadline to submit abstracts: 31 May 2013

<http://europe.aapg.org/2796>





3P ARCTIC

The Polar Petroleum Potential
Conference & Exhibition

3P Arctic 2013

15 - 18 October 2013

FORUM CONFERENCE AND EXHIBITION CENTRE, STAVANGER

The Geoscience Event for the Arctic

www.3pArctic.com

Hosted by



Organised by



EAGE

EUROPEAN
ASSOCIATION OF
GEOLOGISTS &
ENGINEERS



20-22 NOVEMBER 2013 - LISBON, PORTUGAL

EAGE/AAPG Workshop 2013

Basin-Margin Wedge Exploration Plays

In recent decades, the exploration of continental margins has proven successful around the world principally by drilling closures either in extensional provinces (rift or deltaic gliding systems) or in compressive basins (wrench margins or thrust fronts of deltas). In recent years, several significant discoveries have been made in the South Atlantic margins in a new so called "Basin-Margin Wedge Play" which is not controlled by local structural closures but by large scale stratigraphic traps.

The aim of the workshop is to promote discussions on the strengths and failings of such a concept and about the risks associated with each component of the petroleum system: charge, reservoir occurrence and quality, vertical and lateral seals and traps.

Topics:

1. Exploration trends and case-studies
2. Geodynamic and petroleum contexts
3. Associated traps
4. Reservoir challenges

www.eage.org

Call for Papers deadline: 15 July 2013



Manchester Wins The European IBA

The team from Manchester University (UK) has won the 2013 AAPG European Region Imperial Barrel Award semi-final and will go forward to the Annual Convention in Pittsburgh to compete in the Global Final with teams from the other AAPG Regions and Sections. The second and third placed teams were Leoben University (Austria) and Southampton University of Ocean and Earth Science (UK) respectively.

Nineteen university teams from eleven countries assembled at the Albion Hotel in Prague on 21st to 23rd March to take part in the competition. This is the sixth year that a European Region semi-final has been held and seven years since the AAPG initiated the programme.

Over the eight weeks prior to the competition the teams had been working intensively on interpreting a well and seismic dataset and evaluating the plays and prospects in the area of interest. Each team presented the results of their assessment and a recommendation of whether or not to acquire the acreage to a panel of experienced industry judges. The quality of the evaluations and presentations continues to improve each year and the task of judging the competition is increasingly difficult.

The members of judging panel were: Sue Nicholson, ExxonMobil and Chair of the panel; Jack Russell, Shell; Gretchen Gillis, Aramco Services; Jonathan Turner, BG; Rosalie Constable, OMV; Simon Grant, BP; Emily Ferguson, Maersk and Martin Jakubowski, Nexen. The judges were very complimentary of the presentations and the overall programme.

The event also allowed the students to network with the judges and industry observers to find out more about the industry and the opportunities for careers. Many of the universities taking part in the programme do not run petroleum geoscience courses and the IBA is a tremendous opportunity to expand their knowledge of oil and gas exploration.

The IBA programme is in keeping with AAPG's education and outreach goals and the AAPG would be unable to run the competition without the financial support of our sponsors and the organisations that have donated datasets. This year our sponsors were Shell, ExxonMobil, Maersk, BP, BG, MOL, CGG, Nexen, OMV, Total, Solo, Premier, RPS, the London, Mediterranean, Middle East and Africa Scout Group, Hess, Senergy, Sterling and Baker Hughes.

On behalf of the European Region Council I congratulate all the teams on their hard work and we wish the Manchester University team the best of luck for the Global Final. The members of the Manchester team were Martin Kennedy, Rhiannon Jones, Heather Wilson and Papi Ogban and the faculty Adviser was Christophe Serie. I would also like to thank our sponsors and dataset donors and the staff of the London AAPG office for contributing to such a successful event.

If your company would like to sponsor the best global exploration competition for graduate students or donate a seismic and well dataset, please contact me at drdrcook@hotmail.com or for more information go to www.aapg.org/iba.

*Dave Cook
Past President AAPG European Region
CO-Chair AAPG IBA Committee*



The University of Manchester IBA Team



Four-year support for students Chevron Makes Million Dollar AAPG Commitment



Chevron Corporation has made a multi-year commitment for AAPG student programs.

Chevron's generous commitment of \$1 million over four years – \$250,000 per year – will support the Student Member Dues program and a [new program to aid faculty sponsors](#) of AAPG's many Student Chapters around the world, and will help fund the AAPG and AAPG Foundation's IBA program.

The commitment was announced by Steve Shirley, manager of Earth Science Technical Relations at Chevron Global Upstream and Gas in Houston.

Briefly put, Chevron's commitment to AAPG's Student focus will directly benefit AAPG members in two ways:

- For students, applicants for AAPG membership can choose to allow Chevron to pay their dues for the year – which is \$10 (US).
- For faculty sponsors of an AAPG Student Chapter, Chevron will pay their AAPG dues.

"Chevron understands the importance of enabling students from around the world to benefit from AAPG membership and programs, as education opens the door of opportunity," Shirley said. "As an industry, our future depends on attracting and retaining talent and leaders to take on the tremendous challenges of supplying energy to growing economies worldwide."

"This continued and expanded partnership with Chevron will enable us to attract geoscience students into petroleum geoscience and ensure the availability of a future workforce," said David Curtiss, AAPG and AAPG Foundation executive director.

"Chevron recognizes the need to cultivate students and support student programs to ensure they have exposure to geosciences information and data, education and are made aware of geoscience career opportunities," said David Lange, AAPG deputy executive director.

Chevron's announcement extends the company's involvement with and support of AAPG Student activities – a commitment that started in late 2006.

The four-year Chevron commitment to the IBA also was hailed as a significant impact on the exciting and growing program.

"It is a great help and a reflection of confidence in the AAPG and AAPG Foundation IBA Program as we work on fundraising to have Chevron join a number of our other top sponsors in making such a commitment to the long term success of IBA," said David Cook, who with Chuck Caughey is the current IBA Committee co-chair.

AAPG currently has 10,679 Student members and 272 Student chapters (110 in the United States, 162 internationally).

Ever since Chevron first announced specific support for students in 2006 "it has been one of the most popular items to come up in conversation with students worldwide," said Mike Mlynek, AAPG member services assistant manager who works directly with students and student programs.

He added that improvements have been made to the membership processing system to ensure speed and accuracy.

"During this past year AAPG has worked hard to eliminate manual data entry processes and mistakes due to handwritten applications," Mlynek said. "The applications are now handled completely online, increasing the speed and ease in processing new AAPG Student memberships."

Student applicants can pay online by credit card (\$10) or choose the Chevron Sponsorship. Students will login – or create a new account if not already in AAPG's system – and then complete the profile information.

Once the profile is complete the student will click on the "New Applications" link in the gold ribbon at the top of the page. The student applicant can then choose the proper membership form and complete the remaining details.

Applicants will receive an email for each step of the process that is completed: profile (new applicant only), submission of application form and acceptance into AAPG.

The new, Chevron-sponsored Student Chapter Faculty Advisor Sponsorship Program is expected to help those who have become advisors and encourage other faculty members to get involved with the Chapters.

"I am extremely excited about this new program," Mlynek said. "The faculty advisors are absolutely vital to having successful AAPG Student Chapters and in having a successful Student Chapter program overall – they serve as the glue in keeping Student Chapters active and engaged in AAPG and our many programs targeted at the student demographic."

Mlynek sees many benefits to this program.

"Of course, the hope is that it will serve as a 'perk' to those tireless faculty members who serve AAPG in the role of a Chapter's faculty advisor, but it will benefit AAPG and students as well," he said.

"The Student Chapter Committee in the past few years has encountered a number of problems due to a lack of faculty advisors," he said. "We ran into issues where we could not create new Student Chapters at a university because there was not an AAPG member or Associate with paid dues who could serve as the Chapter's advisor, which is a requirement to forming a Chapter."

There also have been active, "very engaged" Chapters that were unable to benefit from programs, such as the Student Chapter Book Gift or the L. Austin Weeks Grant, because the faculty advisor's dues were unpaid.

"With Chevron lighting the torch on another successful program, we anticipate these issues will disappear," Mlynek said.

"Chevron is proud to support the AAPG in engaging students and advisors through these programs," Shirley added. "It is important for advancing earth science technology and developing the profession."

For more information, please contact [Student Chapters](#).

To join AAPG as a Student member, go to [AAPG AppManager Wizard](#).

Vern Stefanic
EXPLORER Managing Editor

London YP: Spreading the Word, Building on Success

By Maxim Kotenev

Drawing on the valuable experiences gained at such industry renowned events as the biennial PETEX Conference and Exhibition, the Young Professionals division of AAPG London hosted a joint networking event with the YP division of PESGB (Petroleum Exploration Society of Great Britain) on the 22nd of November 2012. Earl's Court, the venue of this year's gathering, is the largest exhibition centre and event venue in central London and has a history of hosting a range of prestigious occasions such as the Brit Awards and 2012 Olympic Games.

The meeting offered an excellent platform to meet, exchange ideas and network, providing all attendees with both a technical and social program.

An excellent dynamic assembly held in the main auditorium was aimed at YPs and students alike and took the form of a networking and "Q&A" session which allowed new and existing members to discuss our diverse past achievements as well as future performance opportunities. Particularly enlightening were the current committee's reflections on their own exciting beginnings and the communication of their evident enthusiasm for, and commitment to, the enhancement and development of YP programs on all levels.

An integral part of the event's success was undoubtedly its focus on integration and interaction. More than anything it served to facilitate stimulating and engaging conversation between YPs, students, industry leaders and other experienced representatives on topics concerning, for instance, the future of the oil and gas industry, disciplines integration and career opportunities.

Since the successful development of AAPG is very important, so the close collaboration between European office representatives based in London and the London YP section is so vital for serving the local geoscience community. It is significant then that the networking event succeeded, amongst other things, in increasing AAPG YP membership and giving rise to various interesting ideas regarding the promotion and growth of AAPG in the London oil and gas community.

We apologize for not having included the article into the December issue! The editor.



YP activist from left to right: Maxim Kotenev (AAPG), Thom Allen (AAPG), Sarah Davis (AAPG), Matt Jameson (PESGB)

AAPG European Region Conference, Barcelona, Spain, April 2013

By Keith Gerdes, *President Elect, ER AAPG*

In April the European Region held successfully its sixth annual conference in Barcelona, Spain. The conference entitled, "Exploring the Mediterranean; New Concepts in an Ancient Seaway" consisted of three full days of technical sessions with additional field trips to key geological locations in the region before and after the technical program. The conference was attended by about 400 delegates that formed an eclectic mix of energy industry professionals, academic geoscientists and students from Western and Eastern Europe, the Middle East region and the Americas. The diversity of the attendees bore testament to the high level of industry and academic interest in these intriguing basins.

The core of the conference was the excellent technical program which commenced at the regional scale, as all good geoscience should do, with a fascinating session on models for the complex tectonic evolution of the Mediterranean realm. This acted as an excellent introduction to a series of talks focused on the petroleum systems within the area in which high resolution geochemical analyses were used to characterise the widespread contribution of both biogenic and thermogenic hydrocarbon systems.

Another session, devoted to recent exploration activity in the region, highlighted the results of seismic and drilling campaigns in offshore Italy, Libya and Egypt. These contributions acted as a natural segway to an outstanding presentation by Noble on the game-changing gas discoveries recently made in the Eastern Mediterranean, which are the source of much of the current industry focus.

The program of the following day started with a session devoted to potentially prospective areas in both the western and eastern basins as well as the Peri-Adriatic. A session reviewing aspects of the carbonate plays of the region complemented the subsequent field trip to the excellent carbonate outcrops in the vicinity of Barcelona. The conference closed with an intriguing series of multi-disciplinary presentations on the Messinian Salinity Crisis. This session demonstrated how the understanding of an event critical to the evolution of a series of basins in this complex area can be taken to new levels by the symbiotic interaction of industry and academia.

A successful conference such as this is the result of the hard work and skill of the full time AAPG staff based in London and AAPG members who volunteer their time to act on the Organising, Sponsorship and Technical committees. Particular thanks are due to Jeremy, Fionn and Anisha from the European Region London office for leading the organisation of the conference; the Technical Committee led by Neil Frewin and once again Gabor Tari and in particular the session chairs for reviewing and selecting the abstracts that formed such an exciting and thought provoking technical program; and finally the oral and poster contributors whose presentations stimulated so many intriguing multi-disciplinary technical discussions.

I was particularly pleased with the manner in which the conference acted as a forum to enable geoscientists from different backgrounds to engage, swap ideas and form new alliances based on similar areas of interest. The delivery of great geoscience on relevant topics ran like a red thread through this meeting and it is our intention that great geoscience will be central to everything we do as an organisation going forward. This conference has set the bar high for all our future events. I look forward to working with you all to emulate this success.



Fig.1 AAPG President Ted Beaumont speaks at Opening Ceremony



Fig. 2. Opening Ceremony Audience

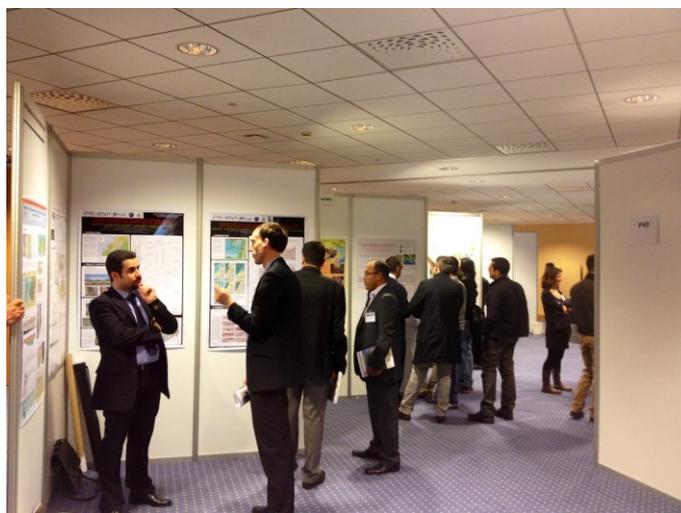


Fig. 3. Fruitful poster session discussion

POST-CONFERENCE FIELD TRIP “Outcrop Analogs of the Gulf of Valencia Oil Fields (Western Mediterranean)”

Led by: Mateu ESTEBAN (REPSOL)

Written by Nuno Pimentel (AAPG Delegate, Portugal)

A field trip is always an opportunity to look at enlightening outcrops and to learn more about its rocks and formation. But even more important, it is usually the best place to think about a sedimentary basin and its petroleum systems! That’s the path that Mateu Esteban guided us, about 20 participants along, using outcrops and landscapes as landmarks for an enthusiastic travel through the old and new exploration paradigms at the Gulf of Valencia.

The field trip started with explanations about the landscape along the road and its analogy with what you see in the offshore seismic lines – excellent idea! Then we got an introduction to the regional geology, using a dozen large-scale figures, posted at the bus, allowing each one of us to look in more detail to this or that image, during the presentation. The focus had been put on “exploration paradigms” for the Gulf of Valencia – yet another excellent idea! Questions like these were asked: How looked the basin during the 20th Century and how does it look today? What changed in data quality, science and technology? What changed in the explorationist’s minds?

OK, now we are ready to fully enjoy the great outcrops and its geological and exploratory meaning in the basin’s evolution! The main observed and discussed issues, always supported by abundant posters pinned at the bus, focused on the interpretation of the oil accumulations that are spatially related to karstified Mesozoic units sealed by Lower Miocene deposits. The role of secondary hydrothermal dolomitization, as a promotor of enhanced porosity and good reservoir properties, on previously overburdened and compacted paleokarsts and breccias had been thoroughly stressed

At the end of the day, I’m sure every participant took something important to discuss and to think about over the next months... as well as a good sun teint for the next few days!



Fig 1. Field Trip Leader Mateu Esteban using posters to explain the characteristics and meaning of the huge unconformable brecciated blocks present at the Garraf - Penedes region.



Fig 2. Outcrop view close to Tarragona, showing the unconformable contact between folded Jurassic limestones (grey) and sub-horizontal Lower Miocene sandy marls (yellow). In detail, this contact seals a prior karstification surface, with infilled dissolution and brecciation features.



Fig 3. Landscape view close to Garraf, with a Miocene reef build-up and talus deposits (around 20 m thick) unconformably lying on top of karstified Cretaceous limestones.



Letter from the Chairman

Dear APPEX Attendee,

I'd like to think that all the very positive feedback I had personally received from delegates at Global APPEX 2013 this week in London reflected the majority, if not all those that attended. I would firstly like to thank everyone who came and hope that the people you may have met will either lead to interests in international deals being acquired and/or divested...or that something you heard about in the various presentations may help unlock your next big international opportunity. Either way I hope you enjoyed the event.

That said, although the APPEX Committee and AAPG European Office supported by Tulsa have worked very hard over the years to create the best event and environment for International Upstream A&D under one roof, I am particularly aware it's all too easy to sit back and not try and continue to further improve the event. I have no intention of trying to "*fix what ain't broke*" but I do want to ensure that we continually ask the questions and tweak APPEX so it continues to grow, evolve and improve. To this end I would ask that you take the few minutes to [complete the attendee questionnaire](#) and add whatever you think could be improved, however wild an idea or constructively critical you feel is appropriate. The feedback I had at the show for example, included several requests to increase the break times to allow more networking in the exhibition area and this has been noted. We take it as a compliment that the talks were interesting enough that delegates wanted to listen as much as they networked. We already have some ideas for a new element at APPEX 2014 to achieve this and also try something new please do help us to continue its improvement.

Finally I hope you will add the dates for Global APPEX next year to your calendar (11th -13th March 2014) albeit a week later due to the availability of the main area where we will be moving the exhibition area as we've out grown the Gallery Hall in the Design Centre. Hope to see you then or, if your regional focus is the Middle East, Eastern Europe and/or CIS, perhaps sooner at the [2nd Regional APPEX in Istanbul](#) later this year (5th - 7th November 2013).

Thank you again for coming, and also to our sponsors, speakers and the AAPG for hosting the event.

Mike Lakin
APPEX 2013 Chairman



Figure 1. Appex London 2013

AREA COUNCIL

President: Vlastimila Dvořáková
Czech Geological Survey
vlastimila.dvorakova@geology.cz
Phone : +42-0543429253
Fax : +42-0543212370

President-Elect: Keith Gerdes
Shell International E&P, The Netherlands
keith.gerdes@shell.com

Secretary: Helen Cromie
Mærsk Oil, United Kingdom
Helen.cromie@maerskcoil.com

Treasurer: Knut Henrik Jakobsson
The Norwegian Petroleum Directorate
knut.henrik.jakobsson@npd.no
Phone: +47 94521894

European Representative in the AAPG Advisory Council:
Andrea Moscariello
andrea.moscariello@unige.ch
Phone: +44.7825.187555

Active Past-President: David R. Cook
drdrcook@hotmail.com
Phone: +44 (0) 1428 645060
Mobile: +44 (0) 7515 506439

OFFICE (LONDON)

Director: Jeremy Richardson
1st Floor
56 Brewer Street
London W1F 9TJ
Phone: +44(0)2074341399 (voice)
+44(0)2074341386 (fax)
<http://europe.aapg.org/>
europe@aapg.org

INTERNATIONAL DISTINGUISHED LECTURER

Manager: Herman Darman
Shell International Exploration and Production B.V.
herman.darman@shell.com
Mobile: +31(0) 61097 2827
Office: +31(0) 70447 5340
<http://www.aapg.org/europe/>

STUDENTS & YOUNG PROFESSIONALS

Florentina Enea
florentina.enea@port.ac.uk

CORPORATE LIAISON & SPONSORSHIP

John Brooks

NEWSLETTER & PUBLICATIONS

Karen Wagner
E-mail: kwag@statoil.com

IBA COMMITTEE

Charlotte Hamilton Charlotte.Hamilton@maerskcoil.com

MEMBERSHIP COMMITTEE CHAIR

Sigrunn Johnsen
E-mail: sigrunn2010@hotmail.no

EDUCATION COMMITTEE CHAIR

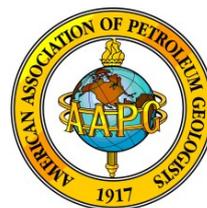
Julie Dee Bell
E-mail: bellj@lsbu.ac.uk

CONFERENCE CHAIR

Neil Frewin
E-mail: neil.frewin@shell.com

DIVISIONS LIAISON

Steve Veal
E-mail: dcxresources@btinternet.com



EUROPEAN REGION

AFFILIATED SOCIETIES

Asociación de Geólogos y Geofísicos Españoles del Petróleo (AGGEP) - SPAIN
Webpage: www.aggep.com
President: Aurelio J. Jiménez Fernández

Association of Petroleum Technicians and Professionals (AFTP) - FRANCE
Webpage: www.aftp.net
President: Isabelle Le Nir

Austrian Geological Society
Webpage: www.geol-ges.at
President: Christoph Spötl

Azerbaijan Society of Petroleum Geologists
Webpage: www.aspg.az

Berufsverb and Deutscher Geologen, Geophysiker und Mineralogen e. V.
Webpage: www.geoberuf.de
e-mail: BDGBBonn@t-online.de

Bulgarian Geological Society
Webpage : http://www.bgd.bg/frames_home_EN.html

Czech Geological Society
Webpage: www.geologickaspolecnostl.cz
e-mail: budil@cgu.cz
President: Dr. Budil

Energy Institute
Webpage: www.energyinst.org.uk

Norwegian Association of Petroleum Geologists
Webpage: www.scanviz.org
e-mail: fr-po@online.no
President: Francisco Porturas
Tel.: +47 51552566
Mobil: +47 45200830

Petroleum Exploration Society of Great Britain
Webpage: www.pesgb.org.uk
e-mail: pesgb@pesgb.org.uk
President: Henry Allen
Tel.: +44 (0) 1224 213440
Mobil: ++44 (0) 1224 213453

Polish Geological Society

Romanian Association of Petroleum Geologists

Royal Geological and Mining Society of the Netherlands
Webpage: www.kngmg.nl
President: P. A. C de Ruiter

Scientific Council for Petroleum (Croatia)

Swiss Association of Energy Geoscientists
Webpage: www.vsp-asp.ch
e-mail: peterburri.geol@bluewin.ch
President: Peter Burri

Turkish Association of Petroleum Geologists
Webpage: www.tpjd.org.tr

Association of Ukrainian Geologists