

Musings on faith and other geophysical foibles

My wife Annie and I recently returned from a rather lengthy visit to the Middle East with two other couples. It was a fantastic experience, while at the same time it was more demanding than any field trip I have ever been on...or maybe that is a reflection of my 61st year. The October timing though did mean that the average temperature every day was plus 35 degrees and reminiscent of field seasons in the Pilbara.

We visited Jordan, Israel, Egypt and Oman, with brief stopovers in Dubai and Qatar. Although it wasn't the main purpose of the trip, unlike many others we met along the way, we covered places important to all manner of religious persuasions from the sun based beliefs of the Pharaohs in Egypt, through Judaism and Christianity to Islam. It struck me how such a small corner of the world is responsible for the beginnings of the great religious philosophies of modern non-eastern religions. It also struck me that many of the holy places are important to more than one of the great religions. They are reasons for either contention such as in some parts of Jerusalem, or agreement, such as in many places highlighted in the old testament, the common book to Jews, Christians and Muslims alike.

It also occurred to me that there is a strong overlap between history, myth and dogma, which brings me back to the word 'faith'. In Israel and Jerusalem in particular, we visited many places that were familiar to me from my Church of England upbringing. They were clearly of great significance to the many pilgrims travelling in the Holy Land but bore no resemblance in my mind to the stories that I was familiar with. Over two millennia since the first Christmas and Easter there is no real historical agreement on the actual site of many of the holy places,

so it all comes down to those that have been decreed the holy place or dogma, and faith...what you believe.

So what does this have to do with geophysics? Long ago it struck me that geophysicists are in the business of measuring phenomena beyond the reach of our normal five senses (try explaining 'gravity' to the average person in the street...). We make measurements and turn them into profiles, maps, images or models that allow us to physically 'sense' the variations we are measuring. Over the years we became better at it and created our own history as a profession. We have developed better instruments, better processing algorithms and a greater understanding of the variables that affect the readings. We have developed our own, albeit scientific, 'dogma'. So what about the 'faith'?

To me, the two bases of faith are what we are taught or dogma, and personal experience. The measurements we make and the products we create are of no use unless they are given meaning through interpretation. We have to turn our data into plausible geological maps which lead to meaningful targets. Then we have to convince our peers to believe it or have 'faith'. How many times have we all sat around a map trying to reconcile divergent views of interpretation?

When you work in a large company for a long time, the low success rate often tests the faith of even the most supportive management. It's the same at the small end of the exploration business where we are asking investors to have 'faith' in our experience and knowledge and to back us in a highly risky business. Long periods without success often see the market lose faith in our business and stop investing.

So in fact to me our whole world is about 'faith'. Science takes us so far, but we

are still in most part dealing with the unseen and the unknown. Leaps of faith and serendipity still form a large part of our endeavours. As we go further under cover, our challenge will be to make those steps more controlled and rigorous and more importantly, to convince non believers that we can be trusted to know what we are doing. This is the only way we will discover the resources needed to meet the challenge of the emerging world.

Anyway, regardless of your religious persuasions, on behalf of the Federal Executive I wish everyone a happy and safe festive season with your families and a prosperous and successful New Year.



Phil Harman
President
phil.harman@bigpond.com

ASEG Federal Executive 2010–11

President and ASEG Research Foundation:
Phil Harman
Tel: (03) 9909 7633
Email: phil.harman@bigpond.com

President Elect: Dennis Cooke
Tel: (08) 8338 7335
Email: dennis.a.cooke@gmail.com

Vice President Conferences: Andrea Rutley
Tel: (07) 3115 5488
Email: arutley@xstratacoal.com.au

Vice President Education: Koya Suto
Tel: (07) 3876 3848
Email: koya@terra-au.com

Immediate Past President: Michael Asten
Tel: (04) 1234 8682
Email: michael.asten@sci.monash.edu.au

Secretary: David Denham, AM
Tel: (02) 6295 3014
Email: denham@webone.com.au

Treasurer: David Cockshell
Tel: (08) 8463 3233
Email: david.cockshell@sa.gov.au

International Affairs: Dennis Cooke
Tel: (08) 8338 7335
Email: dennis.a.cooke@gmail.com

Membership: Cameron Hamilton
Tel: (07) 3839 3490
Email: cameron@energeo.com.au

Publications: Phil Schmidt
Tel: (02) 9490 8873
Email: phil.schmidt@csiro.au

State Branch Representative: Reece Foster
Tel: (08) 9209 3070
Email: reece.foster@groundprobe.com

Webmaster: Wayne (Staz) Stasinowsky
Tel: (04) 0017 5196
Email: stazo@bigpond.com

ASEG History Committee: Barry Long
Email: blong@jafss.com

Conference Advisory Committee: Michael Hatch
Email: michael.hatch@adelaide.edu.au

Honours and Awards Committee:
Andrew Mutton
Email: andrew.mutton@bigpond.com

Technical Standards Committee: David Robson
Email: david.robson@industry.nsw.gov.au

ASEG Branches

ACT

President: Ron Hackney
Tel: (02) 6249 5861
Email: ron.hackney@ga.gov.au

Secretary: Marina Costelloe
Tel: (02) 6249 9347
Email: marina.costelloe@ga.gov.au

New South Wales

President: Mark Lackie
Tel: (02) 9850 8377
Email: mlackie@els.mq.edu.au

Secretary: Bin Guo
Tel: (02) 9024 8805
Email: bguo@srk.com.au

Queensland

President: Fiona Duncan
Tel: (07) 3024 7502
Email: fiona.duncan@bg-group.com

Secretary: Kate Godber
Tel: (07) 3010 8951
Email: kate.godber@groundprobe.com

South Australia & Northern Territory

President: Philip Heath
Tel: (08) 8463 3087
Email: philip.heath@sa.gov.au

Secretary: Michael Hatch
Tel: (04) 1730 6382
Email: michael.hatch@adelaide.edu.au

NT Representative: Jon Sumner
Tel: (08) 8999 3606
Email: jon.sumner@nt.gov.au

Tasmania

President: Michael Roach
Tel: (03) 6226 2474
Email: michael.roach@utas.edu.au

Victoria

President: Asbjorn Christensen
Tel: (03) 9593 1077
Email: asbjorn@intrepid-geophysics.com

Secretary: John Theodoridis
Tel: (04) 1257 0549
Email: jthe1402@bigpond.net.au

Western Australia

President: Reece Foster
Tel: (08) 9209 3070
Email: reece.foster@groundprobe.com

Secretary: CASM
Tel: (08) 9427 0838
Email: asegsa@casm.com.au

The ASEG Secretariat

Centre for Association Management (CASM)
36 Brisbane St, Perth, WA 6000
Tel: Ron Adams (08) 9427 0800
Fax: (08) 9427 0801
Email: asegsa@casm.com.au

A note of thanks

The ASEG would like to thank Rio Tinto and Origin Energy for their contributions as sponsors in the Student Sponsorship Program for 2009–2010. This program aims to secure the future

of our profession by offering subsidised memberships to students interested in careers in Minerals or Oil & Gas geophysics while they study. This year 77 students took part in this program which

has contributed to a record number of student memberships in 2009–2010.

*Cameron Hamilton
Membership Committee Chairman*

New members

The ASEG extends a warm welcome to 49 new members to the Society (see table below). These memberships were approved at Federal Executive meetings held in September and October.

We would also like to welcome a new corporate member to the ASEG.

Quantec Geoscience Pty Ltd was accepted as a new corporate member as of September 2010. Quantec Geoscience has completed more than 2500 surveys globally since 1986. The company delivers high-quality data acquisition, processing, interpretation and other geophysical services to the mining, geothermal, and oil and gas exploration industries. Quantec clients have access to leading and proven technologies that address many earth science challenges – from grassroots and near mine mineral exploration to deep imaging of geothermal host rocks to exploring under volcanic cover or salt for oil and gas. Quantec also provides survey solutions for coal based methane (CBM) and other specialised work.

Quantec uses proprietary technology in their Titan distributed array DCIP/MT system and Spartan MT systems as well as conventional surface and downhole TEM, IP and Ground Magnetics services.

With offices in Canada, USA, Mexico, Peru, Argentina, Chile and Australia as well as agents in India, Brazil and Botswana Quantec can provide services to projects throughout the world.

Contact details for the Australian office are:

2/77 Araluen St
Kedron, QLD 4031
Tel: +61 7 3359 0444
Website: www.quantecgeoscience.com
Contact: Trent Retallick
(Mob: 0410 529 992;
Email: tretallick@quantecgeoscience.com)

Name	Organisation	State/ Country	Member grade
Paul Anderson	Apache Energy Ltd	WA	Active
Toshihiko Ando	Inpex	WA	Associate
Jurin Apisampinvono	Chevron	WA	Active
Maryam Bahrirudsari	Curtin University of Technology	WA	Student
Kira Erika Bruzgulis	University of New South Wales	NSW	Student
Bob Burmaz	PGS Australia Pty Ltd	WA	Associate
John Michael Carew	Southern Geoscience Consultants	WA	Active
Graham Richard Carr	CSIRO	NSW	Active
Shaun Davis	Curtin University of Technology	WA	Student
John David Ellison	Curtin University of Technology	WA	Student
Jamal Ohan Esttaifan	Curtin University of Technology	WA	Student
Gabriela Filomeno	Curtin University of Technology	WA	Student
Reem Freij Ayoub	CSIRO	WA	Associate
Konstantin Alexander Galybin	Schlumberger	WA	Active
Vincent Gruffat	Schlumberger	WA	Associate
Ebrahim Hassan Zadeh	Curtin University of Technology	WA	Student
Bruce Hawkes	Makarra Geotechnical	WA	Associate
David Karel Hutchinson	Geoscience Australia	ACT	Associate
Kent Inverarity	University of Adelaide	SA	Student
Gavin Edward Jones	Curtin University of Technology	WA	Student
Anthony Paul Jumeau	Curtin University of Technology	WA	Student
Vincent Wai Tin Kong	Schlumberger	WA	Active
Aspasia Kouhsen	University of Western Australia	WA	Student
Victor Labson	US Geological Survey	USA	Active
Guhan Manoharan	University of Western Australia	WA	Student
Guhan Manoharan	UWA	WA	Student
Yassily Mikhaltsevitch	Curtin University of Technology	WA	Active
Keith Stuart Myers	Western Geco	WA	Active
Natalie Nguyen	Curtin University of Technology	WA	Student
Eva Papp	Papp Consulting, ANU	ACT	Active
Marina Pervukhina	CSIRO	WA	Active
Andrew Pethick	Curtin University of Technology	WA	Student
Joel Sarout	CSIRO	WA	Associate
Muhammad Shafiq	Schlumberger	WA	Active
F. Hasan Sidi	Woodside Energy	WA	Associate
Paul Christiaan Spaans	Woodside Energy	WA	Active
Henry Reading Steeger	Curtin University of Technology	WA	Student
Linyun Tan	China University of Geosciences	China	Student
Guy Taylor	Woodside Energy	WA	Active
Michael Thomas	Adelaide University	SA	Student
Rebecca Li Jia Tung	Curtin University of Technology	WA	Student
Layne Willem Vanzaanen	Curtin University of Technology	WA	Student
Vicki Louise Ward	PGS Australia Pty Ltd	WA	Associate
Michael Wenz	Curtin University of Technology	WA	Student
Helen Williams	Minmetals Group Ltd	VIC	Active
Takashi Yamatani	Inpex	WA	Associate
Alicia Rebecca York	Curtin University of Technology	WA	Student
Takeshi Yoshida	Inpex	WA	Associate

Australian Capital Territory

The ACT Branch hosted our joint ASEG/SEG Honorary Lecturer, Prof. Alan Green, on the 25th and 26th of October for a talk and short course. On the first day, Alan presented a topical talk on earthquakes and deformation on the eastern side of the New Zealand Alps. His survey area only just missed covering the area ruptured during the recent earthquake that shook Christchurch and surrounds, but the work of Alan and his colleagues from ETH Zurich highlights the danger posed by more obvious faulting closer to the range front. The talk included spectacular examples of how geophysics (primarily shallow reflection seismic and ground-penetrating radar) can image the structures and deformation associated with active faulting.

On Alan's second day in Canberra, around 20 people (including one NSW member and a student from ANU) attended his short course on the 'Application of seismic and geoelectric methods to near-surface and engineering-related studies'. After a refresher on seismic and geoelectric methods, Alan presented a comprehensive set of case

studies illustrating the ways in which these methods contribute to studies of slope instability, dam stability, groundwater contamination, archaeology, water-bearing buried valleys, hidden faults and nuclear waste disposal sites – it seems that geophysics suggests the best nuclear waste disposal sites in Switzerland lie immediately adjacent to the German border! The course was well received and the amount of discussion was testament to its success. Thanks are due to Koya Suto for coordinating Alan's tour of Australia.

Events for the remainder of the year include two talks on airborne EM from Yusen Ley and Aaron Davis (24 November) and, as has been the tradition in recent years, a joint Christmas BBQ with the local GSA and AusIMM branches (7 December). Check the branch web site for details!

Ron Hackney

New South Wales

In October, we had our student evening and two students presented their work.

Luke Mondy from the University of Sydney spoke about how coupling geodynamic models with synthetic seismic surveys can maximise exploration success. Luke spoke about how to directly compare synthetic seismic sections to real seismic data, to iteratively refine crustal deformation models. He discussed how the methodology is particularly insightful in structurally complex regions, and oil and gas fields containing salt bodies and extended salt layers above hydrocarbon reservoirs.

Tim Jones from Macquarie University spoke about the effects of thermochemical piles and post-perovskite on plume dynamics. He emphasised that understanding the convective processes occurring in the mantle has always been a critical goal of solid-earth geophysics. Tim outlined how he employed numerical simulations to examine the dynamic effect of chemical heterogeneity and a post-perovskite phase transition within the lowermost mantle.

In November, the ASEG/SEG Honorary Lecturer, Prof. Alan Green from ETH Zurich, Switzerland gave a presentation on mapping active faults using 3D ground-penetrating radar and 2D and 3D high-resolution reflection seismology. Alan spoke about examples from New Zealand, comparing geophysical datasets with geomorphological datasets. Alan also gave an update on the recent Christchurch earthquake. Many questions were asked and there was much discussion about how great some of the New Zealand GPR was.

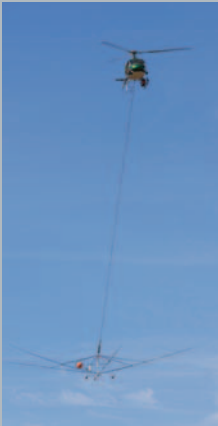

An invitation to attend NSW Branch meetings is extended to interstate and international visitors who happen to be in town at that time. Meetings are held on the third Wednesday of each month from 5:30pm at the Rugby Club in the Sydney CBD. Meeting notices, addresses and relevant contact details can be found at the NSW Branch website.

Mark Lackie

Queensland

The Queensland Branch has a new President, Fiona Duncan, a new Secretary, Kate Godber, and Henk van Paridon continues in the role of Treasurer. We thank outgoing Branch President, Wayne Mogg, and Secretary, Shaun Strong, for their contribution to running the Queensland Branch.

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A busy second half of the year has seen presentations from Natasha Hendricks in July on the topic 'From 4 dry holes to a gas-field'; Wayne Stasinowsky in August on '3D gravity'; Prof. Alan Green, ASEG/SEG Honorary Lecturer in October on 'Mapping active faults using 3D ground-penetrating radar and 2D and 3D high-resolution reflection seismology: examples from New Zealand'; and Kate Godber, also in October, on 'Geophysical studies of the Flying Doctor deposit'.

Fiona Duncan

South Australia

The SA/NT branch recently held a joint luncheon with PESA. The invited speaker – Megan Smith from Woodside energy – presented work on 4D seismic interpretation. This work had been presented at the recent conference in Sydney and was voted as one of the best talks, so this was an opportunity to bring the work to a wider audience.

The Melbourne Cup luncheon is a real social highlight of the ASEG calendar in SA, as geophysicists, friends, colleagues and family get together for an afternoon of networking, fun and good food and

wine. This year was no exception, and the function room at the national wine centre was filled to capacity.

Finally, our annual Student night was held on the 16th of November. We welcomed three students from the University of Adelaide who presented their honours work. The audience was (as always!) very welcoming and it was excellent to see some new faces in the crowd.

We hold technical meetings monthly, usually on a Tuesday or Thursday night at the Coopers Alehouse beginning 5:30pm. New members and interested persons are always welcome. Please contact Philip Heath (philip.heath@sa.gov.au) for further details.

Philip Heath

Western Australia

This year's PESA/ASEG WA 23rd Annual Golf Classic took place on 5 November at the Joondalup Resort and Golf Course. The 144 strong field was treated to a perfect 23 degree day which saw a variety of golfing skills on display.

First place and congratulations went to the 'Andrew Rieu Rocks' team of Len

Chia, Rob Healy, Brett McDonald and Neil Shaw with a final score of 58.1258. Second place went to Dan Gillam, Dave Mellors, Denny Rompotes and Llew Vincent (58.5) and the 'Fugro All Stars' of Toby Bridle, Mick Curran, Mike Riha and Simon Stewart took out third spot with a 58.87. Special mention goes the combined PESA/ASEG committee team of Jennifer Wadsworth, Simon Davey, Amanda Nicholls and Anne Morrell who, with a grand total of 70.59375, took out the much coveted NAGA award. We'll be sure to be back defending the title next year!

Many thanks to all sponsors including gold sponsor CGGVeritas, silver sponsors PGS, Woodside, Fugro Seismic Imaging and Searcher Seismic, and bronze sponsors Enigma Data Services, RPS, Ophir, Key Petroleum and Fugro Multi Client Services. Special thanks goes to Dan Beks and the PESA organising committee for an exceptional day enjoyed by all. Organising of next year's event now falls to ASEG and it is certain to be another 'must attend' for 2011.

Anne Morrell

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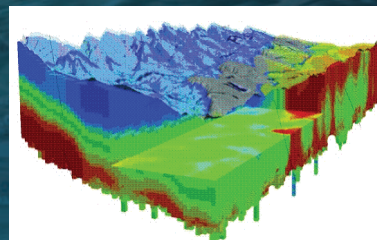
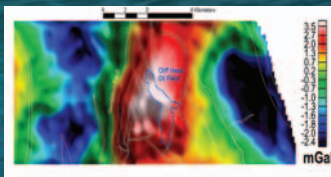
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