

# AUSTRALIAN SOCIETY OF



## EXPLORATION GEOPHYSICISTS

Number 18 February 1989

Perth

Registered by Australia Post  
Publication No. WBG2390

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## INTRODUCTION

The first edition of PREVIEW in the new year has been sponsored by Telecom Australia.

It is time to think about the election of new committees and I would like to draw your attention to the following:

### FEDERAL EXECUTIVE ANNUAL GENERAL MEETING CALL FOR 1989 NOMINATIONS

The 1989 Annual General Meeting will be held in Perth at 3.30 p.m. on

WEDNESDAY, 5 APRIL 1989

7th floor, 12 St George's Terrace  
Perth WA. 6000

It is intended that the Federal Executive will continue to be based in Perth. The Federal Executive herewith call upon the membership to submit nominations in writing to:

The ASEG Nominating Committee  
7th floor, 12 St George's Tce  
Perth WA 6000

for the 1989 Federal Executive positions of:

	Nominees:
President	G. Street
First Vice President	M. Sayers
Second Vice President	G. Steemson
Honorary Treasurer	W. Peters

Nominations are to be in writing, signed by ten or more members with the consent in writing of the nominee and must be received by the Secretary by March 1, 1989.

At the meeting the election of new officers for the Federal Executive will take place. A guest speaker is to be announced and drinks will be served afterwards.

Recently the Financial Standing Committee was disbanded due to the fact that its functions were already carried out by the Executive and other standing committees and it had become logistically unworkable.

There was little news from the local branches by the start of the new year, although the Melbourne '89 Conference is beginning to look exciting especially as it coincides with the VFL Grand Final week. Andrew Lambourne has sent in an interesting article about his trip to the SEG Conference in Anaheim last year. The Education Survey is still in progress and news of it will appear in future editions of PREVIEW.

## ASEG BRANCH NEWS

### ACT

The winner of the coveted ASEG/BMR Golf Champion Cap was Michel Coupard. The Golf Classic was enjoyed by all participants, with occasional splutters of rain and sprinkler dodging.

Branch members were able to get their dollars worth at a Christmas function which was subsidised by both the ASEG and the GSA. A buffet style meal and wine were provided for a cost of \$20 per head.

### NEW SOUTH WALES

Activity has been quiet during December and January. Our Christmas Dinner was held jointly with PESA, since most of our members belong to both Societies.

We received an invitation from Sydney University for one ASEG representative to sit on a committee to review the reorganisation of the Earth Sciences Department and prepare a report for the Vice Chancellor. We regarded this as an important role as it involved the future of Geophysics in all universities in the Sydney region. Our committee proposed Peter Gunn who was deemed well qualified with his background in both hard and soft rock geophysics. He will be attending the university committee later this month. Our next technical meeting is scheduled for late February/early March.

Regards. *Dave Kirkham*

### SOUTH AUSTRALIA

Members who were able to stumble through an endless sea of parties were able to attend the social event of the year, the annual ASEG Christmas party. It was held at Kim Frankcombe's house for the very reasonable price of \$8 per head for members and guests who paid in advance.

Congratulations went to the five students who gave presentations at the Students' Night in November. Deepak Raj Pant took out the Best Paper Award with his talk on the Flinders University Multicomponent Physical Seismic Model System. Regrettably there was a notably poor turnout of members from the educational centres and the Branch hope that this will change for next years Students' Night as the Society and its members have an obligation to encourage research in the field of geophysics.

Following the relocation of Western Mining's Petroleum division to Perth, Ken Seedsman has opted for retirement in Adelaide. Rumour has it that he will keep his hand in with some consulting. Ken was one of the ASEG's founding members and we wish him all the best in retirement, watching the cricket, playing tennis and long lunches. Despite retirement we hope Ken will continue to participate in the Society. So that the experience of memories of Ken and others of his vintage are not lost from ASEG the State Branch of the Society are announcing a senior citizens discount to future S.A. State Branch meetings. Ted Moorcraft, please note.

Regards. *Kim Frankcombe*

### QUEENSLAND

The Queensland Branch AGM was held on Tuesday, 31 January. Cameron Astill, the outgoing President, reported that the Branch was alive and well and Geoff Hines, the outgoing Treasurer, reported that the Branch was also solvent. Cameron thanked the outgoing Committee for their efforts throughout the year.

The Executive for 1989 is:

PRESIDENT DANNY BURNS, Delhi Petroleum  
V/PRESIDENT: ANDREW MUTTON, CRA Exploration  
TREASURER: HENK VAN PARIDON, Crusader Resources  
SECRETARY: BOB SINGH, Halliburton Geophysical

The new Executive decided to expand the Branch Committee and seconded the following members onto the Committee:

STEVE HEARNE	Queensland University
LINDSAY HORN	CSR Petroleum
RICHIE HUBER	Queensland Mines & Energy
CAMERON ASTILL	Halliburton Geophysical
DOUG PRICE	BHP Minerals
JOE WILLIAMS	QUT

Regards. *Danny Burns*

### WESTERN AUSTRALIA

The W.A. Branch Secretary for the last two years, Denny Rompotes, resigned and has gone to take up a new post in Melbourne. The new Secretary is Terry Walker.

The first technical meeting this year was held last Wednesday at the Raffles Hotel. There were two guest speakers, one from petroleum and one from the minerals industry. Mr Hong Sit gave a talk on

"Deconvolution and Wavelet Processing" followed by Dr Ross Andrews who presented "An Exploration Case History of the Kintyre uranium deposit." The meeting was well attended although it was felt that there could have been more audience participation during question time.

There are rumours that a beer tasting will soon be organised by Euan Clarke.



BENEFITS OF

## ASEG CORPORATE MEMBERSHIP

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For further information contact:

The Secretariat  
7th floor  
12 St George's Terrace  
PERTH WA 6000

## ABSTRACTS FROM STUDENTS' NIGHT

The South Australian Branch held their Annual Students' Night on 16th November, 1988. Five post-graduate students gave a 15 minute talk each on their thesis topic. A precis of each talk is given below.

### MULTICOMPONENT PHYSICAL SEISMIC MODELLING

*By Deepak Raj Pant, Flinders University*

A two-dimensional, multicomponent physical seismic model system has been developed at Flinders University of South Australia to acquire digital seismograms for laboratory studies into various aspects of elastic wave propagation. The scale model facility has been designed to record vector wavefields using biaxial piezoelectric receiver transducers and two source types - vertical force (P wave) and horizontal force (S wave). Model materials can be cut and bonded into various shapes to simulate a range of interesting geological structures, although, to date only very simple structures such as layered media, terminating reflectors, faults, mounds and cavities have been studied.

The system produces inexpensive, low noise, high resolution data. The ultrasonic modelling apparatus has been used to test a new form of controlled direction reception (CDR) filter. The physical model experiment shows that the CDR process, which operates in tau-p-polarisation space, is very effective in separating P and S waves, and in rejecting coherent noise such as ground roll (elliptic polarisation) and isotropically polarised background noise.

### MULTI-COMPONENT TAU-P POLARISATION PROCESSING OF SEISMIC DATA

*By Eric Lucas, Flinders University*

This talk presents a modified form of polarisation correlation operator which can be used to separate P and S waves in a multi-component seismic profile. The essence of the method (in seeking S wave extinction) is to form the dot product between the signal vector and the slowness vector during projection into tau-p space using P wave velocity profile measured parallel to the receiver array.

The dot product, in effect, is a linear controlled direction reception filter (CDR 1) which selectively passes only P arrivals.

The second step is to use the converse operator during the forward transform to compute both the P wave 'pass' and 'extinction' planes in w-p space. The best measure of success in isolating the P arrivals is given by performing a cross-spectral matrix analysis of the pass and extinction planes in w-p space on a pixel by pixel basis.

The ratio of the eigenvalues yields the rectilinearity of polarisation and can be used to form a two dimensional gain function to enhance strongly polarised P wave pixels in the pass plane prior to inverse transformation.

### HOMOMORPHIC DECONVOLUTION

*By Jim Leinback, Flinders University*

Homomorphic systems are a class of nonlinear systems that obey a generalized principle of superposition. In recording of seismic data the input source wavelet is convolved with the impulse response of the earth. A homomorphic system for convolution can be used to transform these convolved signals into an additive space. The signals which are now additively combined can be separated easily.

Deconvolving seismic data using homomorphic filtering does not require that the wavelet be minimum phase or that the reflection coefficient series be white, as assumed in Wiener filtering. Considerable filtering possibilities exist using homomorphic filtering since no prior assumptions about the nature of the signals involved need to be made.

### A SYSTEMATIC APPROACH TO DISPLAYING AEROMAGNETIC DATA

*By Shanti Rajagopalan, Adelaide University*

The effective display of aeromagnetic data is crucial to the efficient interpretation of the data set. Selection of the format and design of the displays (function displayed, whether as contour maps or images or profiles, scale of presentation, use of colour) is dependent on the facilities available and on these geophysical criteria - aims of interpretation, magnetic characteristics and geology of the area, and the survey specifications. A case study is used to demonstrate a systematic approach to the selection of displays.

INTERPRETATION OF AIRBORNE MAGNETIC  
AND RADIOMETRIC DATA, PETERMANN  
RANGES AREA, N.T.

*By Andrew Lewis, Adelaide University*

A 16000 square kilometre area of the Petermann and Bloods Range area in the south western corner of the Northern Territory has recently been reflowed with semi-detailed aeromagnetic and radiometric data. This new data represents the first to be collected from the area since the 1960's and is an initial step in the Petermann/Musgrave Block project of the Northern Territory Geological Survey - a detailed remapping program of parts of the southern Northern Territory.

Modern processing and interpretation techniques have been applied to the geophysical data in order to extract the maximum amount of geological information from an area hampered by poor ground access and severely limited outcrop.

Textural interpretation methods applied to the processed magnetic data indicate that there are seven basic magnetic textures in the area. These textural zones can be grouped into two larger magnetic domains which correlate well with the known geology.

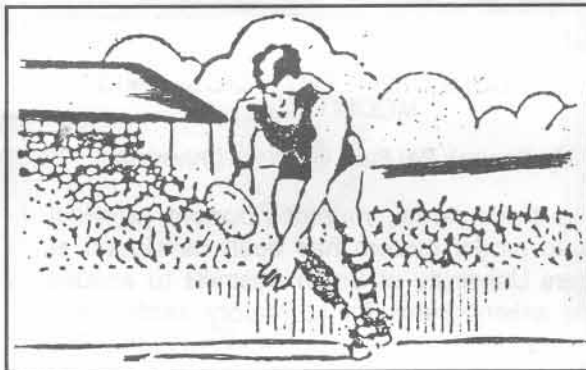
The geological significance of several of the magnetic zones is discussed, including a more accurate interpretation of the position of the Woodroffe Thrust than has been previously possible, and an alternative source to the Cobb Gravity Depression in the light of the new magnetic data.

The nature of the terrain is such that satellite imagery and aerial photography are likely to provide only a minimal amount of extra information on their own, airborne geophysics is the most effective method available to aid in detailed geological mapping.

## MELBOURNE '89

*By Tom Eadie, Co Chairman, Melbourne '89*

Melbourne is the most exciting place in Australia. Or at least it will be in late September during the ASEG Conference and Exhibition (which also happens to correspond with the Victorian Football League Grand Final week).



Over 100 papers have been received to date which is more than we need but I'm sure Mike Asten or John Denham would consider late submissions if they are of the highest quality. A list of accepted papers will be circulated in February. The strictly limited numbers of exhibitor booths have been going quickly so you should book one now before it's too late.

Aside from this technical stuff, arrangements for the social programmes are in full swing. The ice breaker cocktail party is a highlight of any ASEG Conference as is the Conference Dinner which will be at the National Gallery. The Spouses Programme will focus on the sights and gastronomic delights of Melbourne. General social events catering to all delegates will include chances to experience the Fairy Penguins, the Tram Car Restaurant, Sovereign Hill at Ballarat, golf and the VFL Grand Final (Hawthorn vs. West Coast Eagles guaranteed). A well staffed and stocked tourist desk will handle any queries.

The Conference will be at the Hilton Hotel just across Fitzroy Gardens from the city core of Melbourne, from 24-29 September. A great effort is being exerted to make this the best ASEG Conference ever, a very hard task indeed.

All enquiries should go to:

Bloomsbury Conference Services  
232 Bridge Rd  
Richmond Vic 3121  
Tel: (03) 429 4322  
Fax: (03) 427 0715

See you there.

## SEG 1988

### GLOBAL EXPLORATION IN A CHANGING WORLD

ANAHEIM, CALIFORNIA,

OCTOBER/NOVEMBER 1988

*By Andrew Lambourne, Curtin University of  
Technology*

"Anaheim SEG?" he asked.

"Eh?"

"Anaheim S.E.G., do you want to go?"

"Sure," I answered cautiously,

"where's Anaheim?"

And so it was that I landed an all expenses paid trip to the Fifty-Eighth Annual International Meeting and Exposition of the Society of Exploration Geophysicists. What was that I heard him say about having to present two papers while I was there? A small price to pay.

I arrived in L.A. a few days early, "to get over the jet lag", but you can't stay tired for too long with Disneyland just across the road. For the hundredth time I checked that I hadn't lost my slides or presentation material, and then set off to lose my jet lag with Donald and Mickey. (Don't laugh, over 60% of the people that visit Disneyland are unaccompanied adults). Well, I guess riding a roller coaster in the dark is one way of losing your jet lag! Riding a bobsleigh down the Mattahorn is another, visiting Davey Jones' Locker with the Pirates of the Caribbean is another ...

Eventually it had to happen, the hard work had to begin, yes ... the conference was underway. The opening night was a traditional Ice Breaker. Not too much ice was broken with the beer at \$2.50 a can, a bit steep when you could buy a carton of 24 for \$12.00 just down the road. Still, it didn't dampen the mood of rekindling old acquaintances and meeting old friends again, maybe mine were still on their way. I soon stumbled across the management of Geo Systems Australia, it was a relief to see a couple of faces I knew. I met an ex-Curtin University student, now a PhD student at University of Texas at Austin, under the guidance of Paul Stoffa. I became best mates with Milo Backus and Franklyn Levin (well I remember *their* names anyway). When the beer dried up Norm Uren (Curtin University and University of Houston, and broken leg), Joe Williams (QUT and Australian bush hat), and myself knocked off the best part of a carton of Miller (beer flavoured water) and a huge pizza

(which also served as breakfast the following morning).

If conferences are anything to go by, then yes, everything is bigger in the USA (but better?). In Adelaide last February I believe there were about 650 registrants and 100 exhibitors' booths. At Anaheim there were estimated to be nearly 6000 registrants and about 850 booths, with over 250 companies and organisations represented. They ran seven parallel sessions (yep, the seven papers you wanted to see are all on at the same time!). The standard of the papers was much the same as Adelaide - certainly a credit to the ASEG and all those who worked so hard to make Adelaide a success.

Of the 42 sessions (not including posters), 23 were on seismic (including one where a French man fell off the podium during his presentation - truly seismic). The rest were divided equally between EM, data acquisition, developmental geophysics, engineering geophysics, gravity and magnetics, and field development case histories. The main thrusts of the seismic sessions were, predictably, towards migration, deconvolution and wavelet estimation, anisotropy and multicomponent work. Workshops were held on migration, sequence stratigraphy, remote sensing, artificial intelligence, wave propagation and AVO.

I hunted around the exhibition hall - but there was no Norpac stand with scantily clad young ladies serving free beer all day long (probably just as well). There was plenty of free coffee, biscuits, popcorn and even icecream being dished out all day long. Other give aways included stubby holders, key rings, popcorn tubs, canvass bags, luggage tags and even frisbees! I wasn't at all sure I would have room to take all of my clothes back home.

Lasting impressions? Iced currant buns and pancakes for breakfast, the sheer size of the meeting, the dynamic mood created by being surrounded by 6000 other people who all share a common interest, and the realisation that 80% of the people I met came from either Dallas or Houston - those cities must be really something. Just a minute, SEG 1989 is in Dallas, I could have two weeks in Hawaii on the way home this time ... I wonder?

## MEMBERSHIP

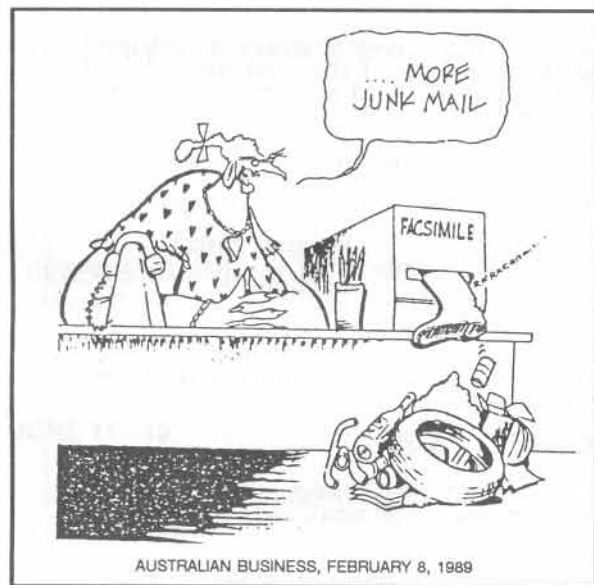
### SALE OR PUBLICATION OF THE DATABASE?

*By Anita Heath - Membership Secretary*

The membership database is maintained by Paula Sinclair at the Chamber of Mines of W.A. At present, only the Executive Honorary Treasurer and the State Branches are to be supplied with a copy of the database plus a confidentiality note and the programs that go with it. Several requests have been made that the database be sold to interested companies, which could raise funds for the Society.

This month we were able to gain sponsorship for the newsletter at the same time as protecting the members' identities by distribution for Telecom.

Another quite popular idea is that members' names and addresses should be published annually as is done by other Societies like PESA and the SEG. This gives people a chance to find out what has happened to old colleagues in the industry. It could also mean more junk mail and advertising through your letterbox. Up until now your membership identity has been protected. We would like to hear your views on this issue.



### NEW MEMBERS

We welcome new members who have joined the Society in the past months:

Member	Category	State/Country
BRIAN LAST	Active o/s	Ethiopia
NENAD DJORDJEVIC	Active	Victoria
RUSSELL SHAW	Active	ACT
ROBERT ELIOT-LOCKHART	Student	WA
JOHN SANGREE	Active o/s	U.S.A.

Member	Category	State/Country
MARK MANDELBAUM	Active o/s	U.S.S.R.
GEOFFREY LYNNE	Associate	NSW
MARK THOMPSON	Associate	WA
JUDITH PRITCHARD	Active	WA
DAVID FARQUHAR-SMITH	Associate	WA
DAVID HOWARD	Active	WA
KEVIN TEARNEY	Active o/s	New Zealand
ANDREW DUNCAN	Student	Victoria
CVETAN SINADINOVSKI	Active	NSW
THOMAS RUANE	Associate	WA
TAK MING LEUNG	Student	NSW

### MEMBERSHIP MOVES

The following change was made to the Victorian Branch membership list:

Mr Bill Lodwick  
143 Somerset Street  
Richmond  
MELBOURNE VIC 3121  
*Previously c/- Tensor Pacific Pty Ltd*

Transferring from the Western Australian Branch to Victoria is:

Mr Denny Rompotes  
c/- Tensor Pacific Pty Ltd  
283 Normanby Road  
PORT MELBOURNE VIC

Transferring from the New South Wales Branch to Western Australia are:

Mr A.J. Saitta  
c/- National Venture Corporation  
U43-44 Como Corporate Centre  
11 Preston Street  
COMO WA 6152

Mr Cameron Blyth  
c/- National Venture Corporation  
U43-44 Como Corporate Centre  
11 Preston Street  
COMO WA 6152

Transferring from the South Australian Branch to Western Australia is:

Mr Kim Frankcombe  
c/- Aerodata Holdings Pty Ltd  
17 Emerald Terrace  
WEST PERTH WA 6005

## MEMBERSHIP STATISTICS

The Australian financial membership as at 30 November, 1988 was:

SOUTH AUSTRALIA	103
WESTERN AUSTRALIA	150
NORTHERN TERRITORY	5
NEW SOUTH WALES	213
VICTORIA	92
TASMANIA	6
QUEENSLAND	91
A.C.T.	70
CORPORATE SPONSORS	35
AUSTRALIAN FINANCIAL MEMBERS	745
UNFINANCIAL MEMBERS	89
OVERSEAS MEMBERS	101

## ADVERTISEMENT

### WORKSHOP 4 APPLICABILITY OF SHEAR ZONE ANALYSIS TO GEOPHYSICS FOR GEOPHYSICISTS

**Duration:** 3 days

**Presenters:** LYAL HARRIS  
GEORGE SAKALIDIS  
JOHN BAXTER

**Content:**

Geophysics, particularly aeromagnetics, have been applied to target definition to mineralization. This workshop will integrate the theoretical, experimental and practical aspects of analysis of shear zone hosted mineralization using geophysical methods. It will review regional tectonic aspects of shear zones, geometry of shear zones in strike-slip and dip-slip terrains, and controls on mineralization.

A brief field excursion will be included to give participants the opportunity to see shear zones in exposures.

A manual will be presented to each participant at the beginning of the workshop. It will include papers on all aspects covered in the workshop.

**No. of Participants:** Min 15 - Max 25

**Venue & Dates:** Glenbrook Estate  
(Margaret River)  
March 16-19

A bus will leave Perth 1.00 p.m., Thursday 16th and return c.a. 5.00 p.m. to Perth Sunday 19th. If desired participants may use their own transport.

**Cost:** \$580

Including workshop, a manual, accommodation, all meals and an excursion to a vineyard.

**Final Date for Acceptance for Registration:**

20th February 1989

**Hermitage Holdings Pty Ltd**

9 Marie Way

**KALAMUNDA WA 6076**

**Tel: (09) 293 3285**

**Cancellation Policy:**

Cancellations made prior to 20th February 1989 are subject to a \$50.00 fee, but will receive the workshop manuals. No refunds will be made on cancellations after that date.