



PREVIEW

AUSTRALIAN SOCIETY OF EXPLORATION GEOPHYSICISTS

A.C.N. 000 876 040

APRIL 1992, Issue # 37

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Introduction

This first edition of PREVIEW from Melbourne, attempts to continue the fine standard set by the previous Editor Anita Heath and production assistant Paula Sinclair. Together with Business Manager Mick Micenko, they have built PREVIEW into a quality newsletter.

On the new PREVIEW team, Geoff Pettifer is Editor, Janine Cross is handling newsletter production and Greg Turner, ASEG Business Manager, is in charge of advertising. This is your magazine, but despite everybody's best effort, the word from many members is that PREVIEW is not fully read, if at all.

The challenge for the new PREVIEW team is to continue to improve our newsletter in quality and relevance. We have ideas, but most ideas and contributions need to come from you the membership. We want to hear from you and receive topical articles and items not normally appropriate for "Exploration Geophysics".

In this issue we feature lists of some new ASEG Branch committees, the AGM reports and news of the upcoming AAPG and ASEG 9th Conferences. Our feature article is from John Stanley whose efforts to find the elusive Mahogany ship after winning first rights to explore, were widely reported recently in the press. John had to contend with up to 40 reporters, some days, just to get on site! His article gets behind the news and gives PREVIEW readers an exclusive, setting the record straight. John Stanley's high resolution ground magnetic system is a world beater, which has been recognised in the 1988 ASEG Graham Sands award. John was assisted by Tony Siggins of CSIRO with a radar system.

On a sadder note, we pay tribute in PREVIEW to Bob Smith (ASEG elder statesman in the petroleum industry) who passed away in December. Bob was widely respected and his many colleagues in the ASEG extend their condolences to his wife, Joyce.

The Editor

President's Letter

During March this year a new Federal executive was elected for the ASEG, all of whom are resident in Melbourne. Yes, its our turn to pick up the reins and ensure that the Society continues to run smoothly and lives up to the expectations of all members. We all have to thank those in Perth who have carried the work so well in recent years and can now, with a sigh of relief, return to earning a living on a full time basis. The Secretariat is in Melbourne with Janine Cross in charge; she will answer all your questions regarding the ASEG or redirect you to the appropriate committee member. But have patience, Janine, like the rest of us, is new to the job. At the moment we are on a learning curve, and learning fast; our first deadline, Preview, is now in your hands, the rest will follow.

The ASEG is your society, with the Federal executive committee controlling its operation only on your behalf. Your input is welcome and necessary. So keep your letters flowing in; you now have a new set of ears to listen to recommendations, complaints, or just interesting bits of news.

*Hugh Rutter
President*

Hugh Rutter ASEG President 1992, a short personal biography

Hugh Rutter graduated with a degree in geology from Durham University in 1963 and was employed by the British Geological Survey. It was here that he met **Peter Howell** (now married to **Eve** in Perth) who taught him that geophysics was a far more interesting occupation. So much so that wider horizons were sought and in 1967 he emigrated with his wife **Anthea**, to Australia and joined the Geological



Survey of **W.A. Des Rowston** was in charge of geophysics here, and he instructed Hugh in the ways of Western Australian and ground water geophysics. But this was the time of the nickel boom and the excitement was 700km further east.

In 1969 he joined Western Mining Corporation in Kalgoorlie, working with geophysicists **Anton Triglavcanin** and **Don Esdale** under the direction of **Roy Woodall**. Three years later he took leave of absence from WMC, returned to the UK and completed a Masters degree in geophysics at London University, which included a written dissertation on transient electromagnetics. TEM and Sirotem were the flavour of the month. Returning to Australia, Hugh was in Kalgoorlie for a year before being transferred to Melbourne where he established an eastern states exploration office in conjunction with **Jim Lalor**. This was an exciting time with exploration activity extending throughout the eastern state and culminating in the discovery of Olympic Dam in South Australia.

Then in 1978 he joined BHP as Chief Geophysicist where he was instrumental in establishing a geophysical section and helped to formulate exploration policy. **Pat Hillsdon**, **Marion Rose**, **Phil Harman** and **Douglas Price** were geophysicists with BHP in those days; but the team enlarged to include **Andre Lebel**, **Mike Asten**, **Guido Staltari**, **Dick Irvine**, **Bill Peters**, and **David Isles**; all familiar names today, some of whom are still with BHP.

Hugh left BHP in 1981 and founded Geophysical Exploration Consultants Pty Ltd with **Guido Staltari**. Guido has moved on to run his own exploration company, but Hugh remains a geophysical consultant. In recent years he has worked in many countries other than Australia, including Malaysia, Fiji, New Zealand, and Mexico. He also works for CSIRO Division of Geomechanics as a Programme Manager in charge of geophysical aspects of research; this has been a major challenge in recent years. Each year he presents part of the AMF course "Geophysics for Geologists" along with **Bob Smith** and **David Boyd**; and lectures occasionally on geophysics at Monash University.

He is a member of a number of other professional societies and is presently Chairman of the Melbourne Branch of the AusI.M.M.

His son David attends Melbourne University where he is studying Building Management; Jane, his daughter is a qualified nurse, and Anthea works as a Planning and Research Officer in the TAFE system. The interests of the family are classical music, live theatre, bushwalking, sailing and skiing. In his spare time Hugh races a Hobie 17 catamaran on the ocean at Anglesea and attempts to ski the black slopes at Mt Hotham in the winter.

ANITA HEATH - RETIRED EDITOR





The ASEG expresses special thanks to retiring PREVIEW editor Anita Heath who with production assistance from Paula Sinclair, produced 22 issues of PREVIEW over 3½ years, bringing professionalism and excellence to the task. Anita pays tribute also to Greg Street and Andre Lebel for their encouragement and assistance with PREVIEW.

Anita, who has some 14 years experience in the oil industry with SSL, Norpac, GSI, Hosking Geophysical, Woodside and Cultus Petroleum is now a part time consultant and devoting her time to the more important task of raising her young family. Anita plans to help out with the 1994 ASEG conference committee as a continuing ASEG involvement.

Thankyou Anita for your valuable service to the ASEG and we wish you well in your future endeavours.

THE AUSTRALIAN INSTITUTE OF GEOSCIENTISTS
&
KEY CENTRE FOR STRATEGIC MINERAL DEPOSITS
Department of Geology, UWA

 PRESENT 
A two-day seminar series:

**GEOLOGICAL APPLICATIONS OF
GEOGRAPHIC INFORMATION
SYSTEMS (GIS)**

6th & 7th of July, 1992
Currie Hall, The University of Western Australia

This seminar series will introduce geoscientists to the principles of geographic information systems (GIS). The speakers will cover a range of topics including current applications of GIS to mineral exploration, mine-site planning, and environmental management.

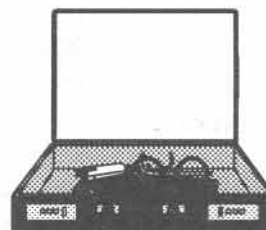
Keynote Speaker:
Dr Graeme Bonham-Carter
of the Mineral Resources Division,
Geological Survey of Canada

Graeme is internationally renowned for his application of GIS and 'weights-of-evidence' modelling to delineate zones of high mineralization potential in Eastern Nova Scotia, Canada.

A variety of products will be demonstrated in order to familiarize attendants with practical applications of GIS.

REGISTRATION
AIG members - \$190 Non-members - \$220 Students - \$100

For more information, please contact:
Jocelyn Thomson, AIG (WA Branch)
3 Rosslyn Street, Leederville WA 6007
Tel. (09) 382 2855 Fax. (09) 381 3724



ASEG Federal Executive

The new Federal Executive is:-

| | | Phone | Fax | Company |
|---------------------|----------------|---------------|---------------|-------------------|
| President: | Hugh Rutter | (03) 818 1272 | (03) 818 1286 | GEC |
| 1st Vice President: | Mike Asten | (03) 810 7700 | (03) 810 7722 | BHP Minerals |
| 2nd Vice President: | Robert Singh | (03) 647 9830 | (03) 647 9835 | Tensor Pacific |
| Secretary: | Brenton Oke | (03) 652 6625 | (03) 652 6684 | BHP Petroleum |
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| Business Manager: | Greg Turner | (03) 881 1279 | (03) 803 2052 | CSIRO |
| Preview Editor: | Geoff Pettifer | (03) 412 7840 | (03) 412 7803 | GSV |
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| Members: | Dave Gamble | (03) 666 5051 | (03) 666 5839 | Billiton |
| | Richard Smith | (03) 818 0044 | (03) 818 0040 | Pasminco |
| Secretariat: | Janine Cross | (03) 818 1272 | (03) 818 1286 | GEC |

Branch News

New South Wales

A special early March meeting at the Lord Nelson Hotel saw Professor Doug Oldenburg from the University of British Columbia, Canada, give a presentation titled "New Approaches in Geophysical Inversions". The meeting was well attended and the presentation very informative (even for non-technical people).

The scheduled March meeting was not well attended and a shame for all those who missed out. Susan Mayo, NSW Marketing Manager for the Royal Flying Doctor Service gave a talk entitled "Wings for the Doctor", which traced the history of the service, its current operations, mind boggling statistics and amusing anecdotes. A very worthwhile service that nearly all in the mining/petroleum exploration industries have relied on at some stage.

The 1991 ASEG/GSA conference held in February 1991 at Darling Harbour, Sydney, was awarded the Best National Conference prize, from a field of 20, by the Darling Harbour Conference Centre. Congratulations to W. Jamieson, T. Pippett and all concerned!

Further congratulations of a different kind, best wishes to Chris Hodge and wife on the birth of their son, William (10lb 14oz) in March.

Juliet Szabados
Secretary

Victoria

The March meeting of the Branch was well attended, Mr Steve Jewell, Vice-President of Advance Geophysical gave a presentation "Sleeping with the Enemy: Do you even like the graphic interface standards to which you are about to be married?", in which he discussed the problems, pitfalls and peculiarities of software standards in the geophysical industry, and whether we should be committing ourselves to standards that may be appropriate for our industry.

Bob Harms
Secretary

Western Australia

♥♥♥♥ Town Talk ♥♥♥♥

Gary Fallon has gotten engaged. - Congratulations!!

South Australia

The South Australian Branch began in 1992 with its AGM on the 3rd March at a little known Italian Restaurant (we know why its renowned!!). Despite all attempts by the restaurant staff, an enjoyable evening was had by those who turned out for the occasion. Without a doubt, the highlight of the evening was a vote! Yes folks, we actually had two nominations for the position of Treasurer.

The first committee meeting, held shortly after the AGM, saw the election of those responsible for the 1992 ASEG wine, and traditional Melbourne Cup Luncheon together with committees to assist with student liaison and monthly meeting organisation.

Our first monthly meeting of 1992 was held on Wednesday 1 April. The guest speaker was Melvan Carter, a lecturer with IHRDC who gave an enlightening and entertaining 20 minutes presentation on the use of velocity as an interpretation tool. This was very well received by the 35 or so present.

Future monthly meetings are planned to feature a "trial run" for those presenting at the ASEG Conference on the Gold Coast.

Ashley Duckett
Secretary



AERODATA

(Contact: Greg Reudauey or Bill Witham)

- Low noise high resolution aeromagnetics.
- Calibrated multi-channel radiometrics.
- QUESTEM digital airborne electromagnetics.
- Horizontal magnetic gradiometry.
- AEROTRAC videography (visible & thermal Ir).
- Helicopter Geophysics (mag/rad/HEM).
- Syledis and differential GPS navigation.
- Multi-client data sales.

WORLD GEOSCIENCE CORPORATION

(Contact: Dave Isles or Kathy Norman)

- Interpretation and consulting services.
- Geophysical image processing.
- Geospectral Imaging Services (with CSIRO).

TIMMINS GEOPHYSICAL SERVICE

(Contact: Greg Street)

- Ground and down hole geophysics.
- High resolution magnetics; micro gravity.
- Electrical/EM (TEM, IP, CASMT, SP, radar).
- Seismic (reflection, refraction, shear wave, cross hole, high resolution).

AERODATA

17 Emerald Terrace Ph: (09) 322 1799
West Perth, WA 6005 Fax: (09) 481 0709

Annual General Meeting

Perth 4 February 1992

Presidents Report

On the completion of the fourth year of the Federal Executive in Perth, the Executive will now move to Melbourne. The Policy of rotation of duties and responsibilities amongst the membership is excellent in that it provides the opportunity for a much wider group to contribute to the organisation and running of our professional society. It also has the additional benefit of sharing the workload amongst the membership. This will also increase the appreciation of the membership of the functions of our office bearers.

The policy of rotation brings with it the problem of the lack of familiarity with the duties and responsibilities by the new personnel. The publication of the Articles of Association in Exploration Geophysics is a valuable contribution. The assembly of a set of Job Descriptions being undertaken by Greg Street for the Office Bearers and Committee of the ASEG will be added to and modified until it achieves the utility and importance of the Conference Procedures Manual as compiled by Steve Mudge, Chairman of the Conference Advisory Committee. Without this latter guide, the task of conference organisation would be even more difficult than it is.

Alongside of the enormous task and responsibility of Conference organising we see the Editing and Publishing of ASEG literature. One of the unresolved pressure points within the Society is the processing and publishing of refereed Extended Abstracts as short papers in Exploration Geophysics. The bulk of this work invariably falls on a few individuals, and solutions need to be found to spread this load. Don Emerson, I am sure must feel the weight of the burden of Editorship over the many years during which he has so ably sustained our Journal.

When I left Australia in 1986 we had "The ASEG Newsletter". When I returned in 1990, we had "Preview". Anita Heath is to be complimented on the completion of her term as editor. This magazine fills the general communication gap due to the much less frequent occurrence of Exploration Geophysics, and provides an avenue for the circulation of information not appropriate for our Journal.

The accompanying reports of ASEG officers and Committees are ample evidence of the time and energy donated by so many profession conscious members. I thank them all for their contributions. It is at the State Branch meetings that grass roots professional exchanges occur. This is where geophysicists meet, and where geophysics lives and grows. Branch executives I salute you.

I wish to express my appreciation and acknowledge the skill and dedication of the 1991/92 ASEG Federal Executive.

| | |
|-----------------------------------|---------------------|
| Mike Sayers | First V.P. |
| Robyn Scott | Second V.P. |
| Andre Lebel | Secretary |
| Craig Dempsey/ Lawrence Hanson | Treasurer |
| Anita Heath | Editor Preview |
| Brian Embleton | Past President |
| Greg Street | Past Past President |
| Mick Micenko | Business Manager |

N. F. Uren
President



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— 3A Mc INNES ST. RIDLEYTON 5008 —

Secretary's Report

Review of 1991

Again, Paula Sinclair of the Chamber of Mines and Energy of Western Australia operated the Secretariat for ASEG.

For the first time, we received resignation letters from members who could not afford to pay dues. Our Society's present membership stands at 914.

Office Bearers

Members were represented by these directors:

President: Norman F Uren
Treasurers: Craig E Dempsey & Lawrence Hansen

First Vice President: Mike Sayers

Second Vice President: Robyn Scott

Other members of the Executive Committee were:

Past President: Brian J Embleton
Publications Officer: Anita Heath
Hon. Secretary: Andre Lebel
SEG Representative: Norm F Uren
Past past-President: Greg J Street
Business Manager: Michael Micenko

Other Office Bearers were:

Hon Editor: Don W Emerson
Public Officer: Lindsay Ingall

These members served as Heads of Committees:

Conference Advisory: Steve Mudge & Tim Pippett
Corporate Affairs: Lindsay Ingall
Geophysical Activity: Roger Henderson
Honours & Awards: Lindsay Ingall
Publications: Terry Crabb
Technical Standards: Don Pridmore

Branches

These members serviced on the Committees of the local branches during 1991:

| State | President | Secretary | Treasurer |
|-------|--------------|---------------|--------------|
| ACT | D Johnson | K Wake-Dyster | |
| NSW | N Jones | S Gagen | L Diekman |
| QLD | A Mutton | V Kissitch | M Barlow |
| SA/NT | T Crabb | N Fitzgerald | P Dunne |
| TAS | B Richardson | Dr Leaman | B Richardson |
| VIC | R Singh | D Gamble | L Thomas |
| WA | K Frankcombe | A Lambourne | D Burns |

New Directors

The following have been nominated for 1992:

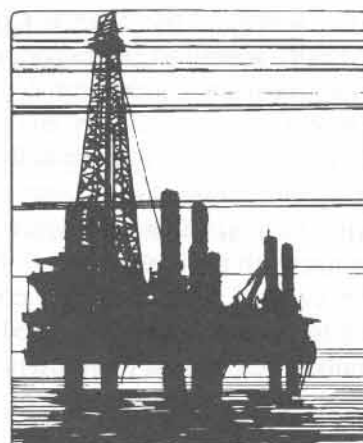
President: Hugh Rutter
Treasurer: Lindsay Thomas
First Vice President: Mike Asten
Second Vice President: Robert Singh

Programme for 1992

ASEG's Executive moves to Melbourne, later in March 1991. New people with new ideas will set the agenda for 1992.

They may wish to set special dues for ASEG members in financial difficulty.

*A Lebel
Secretary*



SEARCH FOR THE "MAHOGANY SHIP"

A Challenge for High Definition Geophysics.

Background

The Victorian Government has offered a reward of \$250,000 for the discovery of a wreck known as the "Mahogany Ship". The ship was first seen in 1836, high in the sand hummocks between Warrnambool and Port Fairy. It was supposedly last seen in 1880 after which the moving sand dunes covered the last traces. It was described by a sea Captain at the time as being of "a build which bespoke ignorance of the art of shipbuilding as we know it". Today the romantics interpret this description as meaning the ship was of "caravel" construction instead of the contemporary "clinker" design. But perhaps it really meant that the ship was built by convict escapees without proper tools?

There were some forty purported eyewitnesses of the wreck and descriptions have been recorded indicating the locality of the ship. The descriptions range from vague "in the hummocks, a long way inland" to the quantitative record of latitude and longitude. However, the evidence contains all the inaccuracies, ambiguities, contradictions and subjective biases characteristic of a legend.

For the purposes of the search conditions, the Mahogany Ship is defined as a wooden ship wrecked within the defined search area prior to 1836.

The Geophysical Research Institute (GRI), at the University of New England was the first of over 100 local and international applicants to be granted a permit to search under the terms of the Search Coordinating Committee. The GRI appraised the historical evidence and concluded that the records quite probably referred in fact to two (or more) wrecks. Mutually inconsistent sets of evidence described localities that were about one km apart. Between $\frac{3}{4}$ and 1 mile east of Gorman's Lane is incompatible with "the point of land on which the old iron church stood in line with the highest point of Tower hill island", and yet each of these sites has corroborating evidence. Given the uncertainties associated with all of the evidence available, each of the two most probable sites extend over an area of several hectares of very steep,

densely vegetated (with thick marram grass) sand dunes up to 40m high.

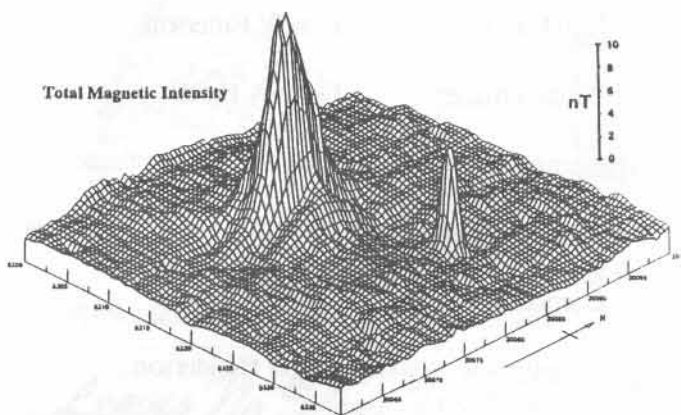
The Search Strategy

The GRI search strategy was to first comprehensively map two, seven Ha areas with a fully sampled magnetic survey. Any located magnetic objects of interest were to then be further examined with ground probing radar from the surface, and with both a down-hole magnetometer and cross-hole radar from auger holes.

Magnetic Search

Magnetic field measurements of 0.1nT resolution were recorded at 0.5m intervals, 0.5m above ground along parallel survey lines each 2m apart. The position of grid reference points was determined with differential GPS equipment. TM-4 caesium vapour magnetometers were used, each mapping approximately 2 Ha per day to this specification. Such high definition magnetic mapping completely defined the sub-dune geology and, by subtraction, enabled magnetic objects within the dunes to be resolved. With some 300 million tonnes of sand (covering a 14 Ha area) to be searched for ferrous objects of perhaps only a few 100gm mass, High Definition Magnetism was judged to be the most efficient and practical method available.

The base-station corrected high definition magnetic data set was image processed on-site with appropriate filters being applied to discriminate against interference from underlying geology. (One of the search areas was in fact found to be underlain by a swarm of approximately 10m thick basic dykes of presumed tertiary origin). The resulting magnetic map displayed a residual magnetic signature of just a few tenths of a nT amplitude.



Superimposed upon this background of geological origin, were several, mostly very weak (about 1nT) magnetic features suspected to originate from discrete, dipolar sources.

Computer-aided interpretation produced a table of anomalies, listing source coordinates, depth and equivalent mass of iron. Most of the anomaly sources were predicted to occur within about 1m of the ground surface. Digging with a shovel enabled these sources to readily be identified, and resulted in a collection of rabbit traps, small scraps of iron and assorted food cans. Items of greater interest were those whose depth (up to 9m below ground) projected to within a few metres of sea level. These items would be expected to pre-date the sand dunes and would most likely be of maritime origin.

Three magnetic target areas were isolated from the data as being the most prospective sites for maritime artefacts. At one of these a magnetic dipole equivalent to a half tonne, compact mass of iron was interpreted at a depth of 7m below the surface and 2m above sea level. This object is 80m inland from high tide, it is behind the first line of dunes and it is within 30m of the grid reference for the wreck as recorded by Mr Peter Holden, a Geelong customs collector in the mid 19th century. Is this object a canon or anchor? Or is it a length of drill rod (having a similar magnetic moment owing to its length) lost by an earlier searcher?

The two other magnetic target sites contain a localised scatter of small objects within a 10m radius. The magnetic amplitude from these sources at 6 to 8m depth is a mere 1 or 2nT. On the magnetic evidence alone they would hardly justify an excavation.

Ground Probing Radar

A Terralogic model TL-1 GPR system was used with an assortment of antennae designed to suppress horizontal stratigraphy and to enhance discrete objects. Relatively high transmission frequencies (0.5 to 1GHz) were necessary if small objects were to be resolved. Radar at these frequencies required a flat, cleared surface to enable the antennae to couple efficiently with the ground. This severely restricted the widespread application of radar at these frequencies in such an environmentally sensitive area. Subsequent to our deployment of the TL-1, Dr Tony Siggins of CSIRO Division of Geomechanics has applied a SIR-8 GPR system transmitting at 120 MHz.

At this frequency the radar penetration was not adversely effected by the air-gap produced when the antenna was operated above the marram grass. Using CSIRO developed software, Dr Siggins produced impressive radar profiles clearly showing the dune stratigraphy but it remains speculative whether the low frequency GPR would resolve the small artefacts of interest to this search.

The TL-1 GPR system successfully confirmed that one of the magnetic features of recognised interest to our search was in fact the remains of a 19th century fence. This information was of importance as some historical evidence relates the Mahogany Ship to a fence build in 1862. One of our magnetic target areas bears this same relationship to the fence. This site is about a km west of the previously noted magnetic target. Is this the second of the two wrecks? Evidence from down-hole measurements is now required if an excavation is to be justified at this site.

Both GPR systems produced clear reflections from depths of over 15m or down to the saline water table.

Down Hole Magnetometer

It has long been on our agenda to build a down hole, caesium vapour magnetometer probe. The need to closer investigate anomaly sources at depth has provided the stimulus needed. A total field, down hole probe of 80mm diameter has now been built. It will be used shortly to try and confirm whether or not the dipole anomalies of less than 1nT amplitude at ground level are in fact due to small ferrous objects 6 to 8m below surface.

Down-hole And Cross-hole Radar

In collaboration with Dr Tony Siggins, a graduate of UNE and respected scientist with CSIRO, down-hole and cross-hole radar will be directed at selected, deep magnetic targets. Tony has been successfully engaged in the development of radar tomography and involvement in the Mahogany Ship search provides a constructive challenge to this research.

Excavation - The Final Word

A coal industry colleague advocated a "bit of mining gusto" - a Kato and grass transplanting team, in and out one dark night - to alleviate the academic pain. However, environmental sensitivity has determined that any excavation will be conducted by the Victorian Archaeological Survey and that they will excavate only on the most convincing evidence submitted after all permitted parties had concluded their search. It is likely that the final test of our geophysics will not take place until late 1993. However, Mahogany Ship relic or not, already the challenge has stimulated research, the technological results of which have immediate benefits to the mineral exploration industry and those involved with relocating buried industrial waste and hazardous materials.

*John M Stanley
Geophysical Research Institute
University of New England.*

AAPG-PESA PETROLEUM GEOLOGY CONFERENCE & EXHIBITION

SYDNEY CONVENTION CENTRE,
Darling Harbour, 2-5 August 1992

The largest international petroleum geology conference to be held in Australia is planned for the Sydney Convention Centre from the 2nd to the 5th of August, 1992. It is sponsored by the American Association of Petroleum Geologists (AAPG), the largest association of geologists in the world with nearly 35,000 members. The Petroleum Exploration Society of Australia (PESA) is co-hosting the conference.

In recent years, the AAPG has noted that its international membership has been rising rapidly, and, to recognise this trend, it has decided to hold an international meeting (outside North America) each year. These meetings will alternate on successive years between Europe and the South East Asia/Western Pacific region. The initial meeting was held in London in September/October last year and Australia is the venue for the second meeting (subsequent meetings are planned for The Hague (1993) and Kuala Lumpur (1994) so it may be many years before this conference returns to Australia)

An interesting and varied program of 162 oral papers and 32 poster presentations has been selected for the conference proper. Five concurrent sessions will be held on topics covering current areas of interest including Papua New Guinea and the Mesozoic and Tertiary basins of the Indonesian Archipelago, the South China Sea, and the Northeast Asian margin. The prospectivity of the neglected intra-arc basins of the Southwest Pacific forms another session. Naturally the local basins of New Zealand and Australia (both onshore and offshore) make up a number of sessions. Of great interest will be sessions on the potential of, and production from, the Proterozoic and Palaeozoic cratonic basins of Australia and Asia, with papers from as far afield as the Timan Pechora Basin of northern Russia, the East Siberian Platform, plus the Ordos, Sichuan and Xinjiang Uygur regions of China. In addition, there are sessions on technological advances in

geochemistry, geophysical detection systems and on reservoir geology and the engineering and management of reservoirs. The environmental impact of the processes used in any extractive industry is of concern to us all, so this aspect of petroleum exploration is not overlooked.

In the opening session, an overview of exploration and production in the Pacific Rim zone will be given by Nahum Schneidemann of Chevron Overseas Petroleum. An Australian view of exploration in the region will be given by Brian Griffith (Group General Manager - Asia of BHP Petroleum) and the views of an overseas explorer and producer will be given by G.A.S. Nayoan, Senior Vice-president and Director of Pertamina.

Field Trips

A feature of the conference will be the extensive field trips which will enable overseas and local geologists to visit classic localities throughout Australia and also in New Zealand and Papua New Guinea. In all, ten field trips are planned. Because of the need to reserve accommodation, etc., bookings for these excursions must be made before June 1, 1992 to ensure that the minimum number of participants are available. If insufficient bookings are obtained, the excursion will be cancelled.

The field trips are:

Pre-conference:

1. Canning Basin Devonian Reef complexes, Kimberley WA
2. Amadeus Basin - Late Proterozoic to early Palaeozoic, NT
3. Northern Great Barrier Reef - Carbonate reef, North Queensland
4. Sydney Basin/Blue Mountains - Permian-Triassic, NSW (Spouses also)
5. Southern Sydney Basin - Coastal exposures, NSW (Spouses also)

Post-conference:

6. Northern Sydney Basin and Hunter Wineries (Spouses also)
7. Flinders Ranges - Proterozoic-Cambrian boundary, SA
8. Southern Great Barrier Reef - Heron Island, Queensland
9. Taranaki Basin, Western Basins and Southern Alps, New Zealand
10. Aure Scarp traversing, Mesozoic-Eocene, Papua New Guinea

continued Page 15

Short Courses

Seven "Short Courses" are offered both pre- and post-conference. These workshops are designed to be eligible training programs under the Federal Training Guarantee (Administration) Act, and, as such, expenditure related to the workshop should be deemed as eligible training expenditure.

Pre-conference:

1. Balanced Cross-sections in Hydrocarbon Exploration and Production
2. Geological Applications of Capillary Pressure
3. Australian Petroleum Systems: Palaeogeography as a control on Petroleum Occurrences and as an Exploration Tool
4. Apatite Fission Track Analysis in Oil Exploration

Post-conference:

1. High Energy Carbonate Environments of the Southwest Pacific: Facies Models for Exploration
2. Seismic Facies Mapping, or why bother with Onlaps?
3. Extensional Structural Systems and Petroleum Entrapment in the Australian Region

Note that registration for the field trips and the short courses will be accepted from persons who are not planning to attend the main conference.

Student Participation

The conference will provide a wealth of new data for students of sedimentary geology, geochemistry, geophysics, and petroleum geology. To encourage student attendance, a low fee of \$25 will cover all aspects of the conference, including receptions and the Monday luncheon.

A special one-day student excursion (costing \$15 for transportation, lunch and guidebook) will be held on Thursday August 6th. This will examine a miniature Mississippi-type delta in Lake Illawarra to the south of Sydney, and the comparison of the facies developed there with similar facies in the Permian Illawarra Coal Measures.

For Details: All members of AAPG and PESA will receive a copy of the "Announcement" (which contains the registration details and further details on short courses and excursions) in the mail. To obtain copies of the detailed Announcement, non-members should write or fax to:

Murray Johnstone
General Chairman
1992 AAPG-PESA Conference and Exhibition
4 Edinburgh Avenue, Carlingford NSW 2118
FAX: (02) 630 8717

Obituary

Edward Robert Smith 1927-1991

Four days before Christmas 1991 Bob (Edward Robert) Smith passed away. His struggle with cancer lasted nearly two years. During this time he was supported by his devoted wife, Joyce.

Bob had retired in late 1990 after an illustrious career in petroleum exploration spanning 42 years. Directly after graduating with a major in Physics from the University of Melbourne in 1948, Bob joined the Bureau of Mineral Resources as a geophysicist. He was a pioneer in applying the seismic method to petroleum exploration in Australia. Bob was involved in some of the first seismic surveys conducted in Australia and was responsible for integrating gravity and magnetic interpretation into seismic assessment. Bob ascended the geophysical ranks at the BMR, culminating in promotion to Head of Petroleum Subsidy Section. While heading the Subsidy section Bob gained wide recognition and respect in the industry. In 1977, Bob was promoted to the position of Head of Petroleum Exploration Branch. During the five years that he managed the Branch he investigated Australia's sedimentary basins, administered technical aspects of the Petroleum (Submerged Lands) Act, and evaluated "new" oil pricing applications. While at the BMR, Bob wrote two dozen technical publications.

In 1982, at age 55, Bob took early retirement from the BMR. Later that same year he entered private industry by joining Weeks Australia (later Peko Oil) as Chief Geophysicist. Prior to retirement from the company in 1990 Bob's role was that of Manager Exploration. Perhaps the most satisfying aspect of his work in the private sector was his involvement in the discovery of oil at Jabiru, Challis and Skua in the Timor Sea during the early to mid-eighties.

Bob was a long serving and active member of the major geophysical societies, including ASEG, EAEG, and SEG, as well as PESA. A great deal of his time over the years was dedicated to the support of the ASEG. Bob served on State and Conference Committees and was a guest editor of Exploration Geophysics.

In his youth Bob enjoyed playing sport, particularly football (Australian Rules) and cricket. His enthusiasm for sport continued throughout his life. This enthusiasm was one hallmark of his career in petroleum exploration. Another was Bob's attention to detail. Both these traits were often passed on to the many geophysicists whom Bob trained over the years. Despite his many achievements, Bob was a modest and unassuming man of gentle manner and friendly nature. To his friends, many of whom are in the petroleum industry, Bob will be sadly missed but never forgotten.

ASEG 9TH GEOPHYSICAL CONFERENCE & EXHIBITION - At a Glance



Perusing PREVIEW's copy of the 9th ASEG Conference Provisional Program, one can see that the conference promises a stimulating technical program:

- * 3 days of 92 technical papers, 4 concurrent technical sessions, covering 22 subject areas.
- * 4 days of workshops pre- and post-conference.
- * 21 poster papers over 2 days.

The workshops are:

- * Airborne Geophysics in Australia (October 4-5).
- * ISP 003 workshop on 2-dimensional migration of discrete horizons and advanced mapping.
- * Seismic Refraction Interpretation with the GRM.
- * Human and Organisational aspects of Managing Exploration
- * Applications of Shallow High Resolution Seismic Reflection.

Subjects covered and the number of papers in each subject (shown in brackets) are:

EM (6), minerals (3), magnetics (6), tomography (3), seismic migration (3), Petroleum magneto - tellurics (2), seismic acquisition (3), seismic modelling (3), seismic signal processing (9), regolith mapping (3), mine site geophysics (2), seismic interpretation (4), seismic (5), mining geophysics (2), coal geophysics symposium (7), basin development (4), seismic refraction (4), and gold (3).

A highlight of the conference technical sessions will be the Mt Isa Symposium (reported in a following article) and the coal geophysics symposium. A registration brochure with the final program will be distributed to you shortly. I hope you can make it to the Gold Coast.

The Editor

ASEG RESEARCH FOUNDATION

Successful Applicants For the ASEG Research Foundation Grants

The ASEG Research Foundation formally commenced its function in September 1989. The aim of the Foundation is to support into exploration geophysics via approved research projects at B.Sc. (Hons.) and M.Sc. level in Australian Tertiary Institutions.

In 1991 the ASEG Research Foundation provide grants to four projects. This year five projects have been successful, three in petroleum and two in mining. the successful projects are briefly outlined below.

Petroleum

Dr G Beresford, University of Melbourne - M.Sc grant provided for computer charges, maintenance and programming.

"Application of reflection tomography to determining velocity in surface reefs on North west Shelf seismic data".

Surface reefs in areas like Browse Basin represent significant lateral velocity variation and produce distorted seismic sections. Wave-equations datuming or pre-stack migration can be used to correct this problem but both require an adequate estimate of the velocity field within the reef. In this project a new method of applying reflection tomography will be tested in which the seismic data will be downward continued to the water bottom for tomographic inversion.

Dr J J Stienstra, University of Sydney - M.Sc. grant to cover cost of computer equipment.

"Development of large bioherms on the shelf-edge in relation to sequence stratigraphy and the potential for hydrocarbon entrapment".

The project will involve the interpretation, mapping of cycle boundaries and sequence stratigraphic analysis, identifying reef contacts and differentiations in the bioherm and the adjacent reef associations.

Mr B J Evans and Dr N F Uren, - MAppSc. grant for modelling materials, magnetic tapes, computer costs and consumables.

"The seismic reflection process in anisotropic media".

The project will use the physical modelling facility at Curtin University to record 2-D data over three anisotropic physical models of geological structures using conventional industry recording parameters, and compare the results with those achieved by using conventional ray tracing.

Mining

Dr A Trench and Dr J Ridley - B.Sc (Hons) grant for field costs, thin sections and consumables.

"Metamorphic and geochemical controls on the magnetic signatures of West Australian greenstone belts".

The project will assess the effects of changing metamorphic grade, chemical alteration and host rock geochemistry on the magnetic properties of greenstones. The study will target the Southern Cross Greenstone Belt and the Kalgoorlie-Menzies area of the eastern Goldfield province.

Dr J Cull, Monash University - M.Sc grant for field costs and consumables.

"Noise reduction in downhole TEM surveys".

The aim of the project is to carry out an analysis of signal processing techniques for TEM data and to compare the surface data with downhole TEM anomalies.

The ASEG Research Foundation would like to congratulate the successful applicants and acknowledge the work of the subcommittees in what was a very difficult decision.

Applications for 1993 grants will be requested shortly from Institutions. The deadline for applications will be 30th September, 1992.

Since the last issue of Previews the following have contributed to the ASEG Research Foundation:

ASEG - SOUTH AUSTRALIAN BRANCH \$1,200

UNIVERSITY OF NEW ENGLAND \$2,037



ASEG RESEARCH FOUNDATION

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Peter Priest, 39 Ningana Ave, KINGS PARK, SA 5034

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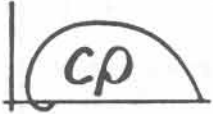
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GEOSCIENCES WORK TO UNLOCK MT ISA'S WEALTH

The necessity to determine the full mineral potential of the Mt Isa Inlier has seen geophysicists and geologists increasingly join their technological forces.

Geoff Derrick, a leading Queensland exploration and resources consultant, said that although only 50,000 square kilometres of the Inlier outcropped and was being actively explored, remote sensing and geophysics showed that it actually extended for about 150,000 square kilometres. Geologists and geophysicists are increasingly putting aside their traditional, if friendly, rivalries to unlock the mineral potential of the Mt Isa Inlier's remaining 100,000 square kilometres hidden under sand and younger rock. The exposed section of the Inlier in which current projects are operating represents only one third of the area's total size and potential mineral wealth. State of the art geophysical technology is being applied to help determine the true potential of the unexposed sections of the Inlier.

Dr Derrick, a geologist, is one of the introductory speakers at the Mt Isa Symposium, a feature of the forthcoming Australian Society of Exploration Geophysicists 9th Geophysical Conference and Exhibition. The Symposium will be a forum for discussion and debate on the latest geophysical information about the most active exploration area in Queensland and possibly Australia.

Dr Derrick said the exposed 50,000 square kilometres of the Mt Isa Inlier contained metals worth about \$A100 billion at current prices. Known or previously mined deposits contain about 42 million tonnes of zinc, 25 million tonnes of lead, 10 million tonnes of copper and 2.5 million ounces of gold.

"There is obviously a strong possibility that many parts of the Inlier concealed under younger cover could be as richly endowed with metal resources, but to what degree is unknown. Technological and economic limits will obviously place restrictions on the depth we can explore to in these unexposed areas as many are under 300 to 400 metres or more of cover. Nevertheless, we are already recognising in the Mt Isa Inlier coincident gravity and magnetic geophysical anomalies of the type which characterise the great Olympic Dam

copper-gold-uranium deposit in South Australia, found in 1975 at a depth of more than 300 metres. Providing metal prices can recover from their current lows, targets such as this are well within our future geological and geophysical exploration capabilities in the Mt Isa Inlier. This is where developments in geophysical technology are gearing up to meet the exploration challenge and making the job of geophysicists very rewarding".

"Already we have seen a number of discoveries made along the eastern fringes of the Inlier north and south of Cloncurry under 30 to 50 metres of cover. These include the lead-rich Cannington discovery by BHP, and the copper-gold discoveries at Eloise (also BHP), Osborne (Placer) and most recently Ernest Henry (WMC/Hunter Resources). In each case, discovery resulted firstly from an understanding of the geological and geophysical characteristics of known deposits in the area and secondly, by drilling targets highlighted by state of the art aeromagnetic and ground magnetic geophysical technology".

Dr Derrick said that "many known and new deposits were characterised by the presence of magnetite, either in massive lodes or disseminated in sediments. This means magnetic methods of geophysical exploration are very suitable in the initial exploration stages. Electromagnetic methods (EM), in rocks, are widely used in conjunction with magnetics to better define the highly conductive, metal-rich massive sulphides which are commonly associated with the magnetite".

"Osborne appears to be a good example of geological and geophysical interaction where each drilling campaign is followed by reassessment of geological and geophysical models from which new drilling targets are outlined. In a little over 18 months, Placer has almost tripled its indicated resource tonnage at Osborne, from 13.6 million tonnes at 1.9% Cu and 1g/t Au, to 36 million tonnes at 2% Cu and 1g/t Au."

"In contrast to the magnetite-rich deposits in the east of the Inlier, the world-class lead-zinc deposits to the west and northwest such as Mt Isa, Hilton and Century, are devoid of magnetite, so EM geophysical methods are in wide use in the search for this kind of deposit. EM methods, especially Transient EM, as well as being capable of delineating areas of massive lead and zinc sulphides, are also useful in outlining sedimentary basins of carbonaceous black shale which commonly host deposits such as Century".

"According to CRA, the discoveries of Century, the deposit was found specifically by geochemical sampling of soils above the largely hidden deposit. But EM geophysics was helpful in defining the extent of the mineralisation and in planning future deposit development".

The application of new technology to geophysics will be one of the features of the 9th Geophysical Conference and Exhibition being held on the Gold Coast, October 5 to 8 this year. A trade exhibition will highlight some of the latest developments in geophysical instrumentation, communications technology and computing spanning from petroleum and minerals exploration through to engineering and the environment.

For further information contact:

Melissa Ray/Marian Hudson

PH: (07) 369 0477



ASEG 9th
Geophysical
Conference
and
Exhibition

☆☆☆☆☆☆

ASEG SUBSCRIPTION FEES

Members are reminded that ASEG fees are

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| Corporate | \$300 |
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Membership

New Members

We welcome the following new members to the Society. Their details need to be added to the relevant State Branch database:

South Australia

Paul BASFORD
5 Alton Avenue
Gilles Plains SA 5086
Tel: (08) 266 0417

Alexander BONTENAKEL
4 Rice Court
Para Hills SA 5096
Tel: (08) 265 3285

John CAON
Zonge Engineering
240 Glen Osmond Road
Fullarton SA 5063
Tel: (08) 338 1559 Wk
(08) 298 2549 Hm

Robin GERDES
14 Olive Grove
Haxelwood Park SA 5066
Tel: (08) 274 7682 Wk
(08) 332 1730 Hm

Dr David TUCKER
Preview Resources Pty Ltd
P.O. Box 305
Eastwood SA 5053
Tel: (08) 338 2783

New South Wales

Long CAO
University of Sydney
Dept of Geology & Geophysics
Sydney NSW 2006
Tel: (02) 692 3304

Richard JASON
14/23 William Street
North Parramatta NSW 2151
Tel: (02) 683 3961

Dr Charles SKILBECK
Dept Applied Geology
University of Technology, Sydney
P.O. Box 123
Broadway NSW 2007
Tel: (02) 330 1760

Western Australia

Noelene DORN
122 Richmond Street
Bleederville WA 6007
Tel: (09) 444 7430

Matthew FLEMING
17 Holford Way
Wilson WA 6107

Brett HARRIS
Unit 14/68 Gardner Street
Como WA 6152
Tel: (09) 368 2356

Shane WILKES
266 French Street
Tuart Hill WA 6060
Tel: (09) 349 5135

Tasmania

Lachlan HEASMAN
Codes Key Centre
University of Tasmania
GPO Box 252 C
Hobart TAS 7001

Overseas

Charles SWIFT
Chevron Overseas Petroleum
P.O. Box 5049
San Ramon California 94583 USA
Tel: 510-842-2661 Wk

Where Are They???

Does anyone have the new address for any of the following members:

Mr C W LUXTON
formerly of Mitcham, VIC
Mr C S GARBLER
formerly of Lane Cove, NSW
Mr J T FRAZER
formerly of SINGAPORE
Mr J R TODD formerly of Denver, Colorado, USA

Change of Address

The following changes need to be made to the relevant State Branch Databases:

Victoria

Dr Vincent Paul ST JOHN
To: Prospect Evaluation Pty Ltd
5 Dundas Lane
Albert Park VIC 3206

Shaun GREGORY
From: Kardinya WA
To: BHP Petroleum
GPO Box 1911R
Melbourne VIC 3001

Theodoros ARAVANIS
From: Preston Vic
To: CRA Exploration Pty Ltd
P.O. Box 8093
Northland Centre Vic 3072

ACT

Andrew LEWIS
From: Phillip ACT
To: 44 Woollum Crescent
Rivett ACT 2611

New South Wales

Alexander McNAUGHT
From: Berrima NSW
To: "Delwood Park"
Berrima NSW 2577

Michael & Christine LEYS
From: Orange NSW
To: 9 Parsons Close
Bathurst NSW 2795

Robert D. HEWSON
From: Victoria
To: Post Graduate Students
Dept of Applied Geology
University of NSW
P.O. Box 1
Kensington NSW 2033

John Michael WOODWARD
From: Kensington NSW
To: 29 The Bulwark
Castlecreag NSW 2068

Shane WRIGHT
From: Coogee NSW
To: 3 Robson Place
Gerrigong NSW 2534

Christiaan BUECHNER
From: Umina Beach NSW
To: 6/42 Bay Road
Waverton NSW 2060

Michael MOORE
From: Kalgoorlie WA
To: C/- 52 Ferguson Street
Forestville NSW 2087

P.J. HUNT
From: Summer Hill NSW
To: C/- Galashiels Pty Ltd
P. O. Box 17
Grosvenor Place
Sydney NSW 2000

Dinu RADUCANU
From: Brendale Qld
To: 4/16 Chester Street
Woollahra NSW 2025

Correction to Address:

Susanna SCARANO
22 Tunks Street (Not Ar)
Ryde NSW 2112

James TAYTON (should read)
Lot 4, West Bank
McCarr's Creek
Church Point NSW 2105

South Australia

Ian EDWARDS
From: West Perth WA
To: Santos Ltd
101 Grenfell Street
Adelaide SA 5000

Charles SHEEN
From: Alfred Cove WA
To: Santos Ltd
P.O. Box 2319
Adelaide SA 5000

Correction to Address

Richard HILLIS
P.O. Box is P.O. Box 498
not P.O. Box 495
ADELAIDE SA 5001

Western Australia

Kim FRANKCOMBE
To: Normandy Poseidon Ltd
P.O. Box 1143
West Perth WA 6872
Or: 8 Kings Park Rd
West Perth WA 6005

Andrew COLE
From: St James WA
To: 39 Nearwater Way
Shelley WA 6155

Matthew LAMONT
From: East Vic Park WA
To: 22 Park Street
Como WA 6152

David JONES
From: Inverell NSW
To: 162 Robert Street
Como WA 6152

Richard BRESCIANINI
From: Spring Hill Qld
To: C/- BHP Minerals Ltd
P.O. Box 6062
East Perth WA 6004

Terry ALLEN
From: North Ryde NSW
To: HGS INC
32 Richardson Street
West Perth WA 6005

Brad GEORGE
From: Sydney NSW
To: M.I.M. Exploration Pty Ltd
140 Collin Street
West Perth WA 6005

Queensland

Robyn SCOTT
From: Shelley WA
To: BHP Minerals
Exploration Department
152 Warf Street
Spring Hill QLD 4000

Gary FALLON
From: Mt Isa QLD
To: MIM Explorations Pty Ltd
NW Qld
Star Gully
Mt Isa Qld 4825

Mr R J Angus
To: C/- Placer Pacific
AGL House
6th Floor
60 Edward Street
Brisbane QLD 4000

Overseas

Prof Dr. RUETER
From: Germany
To: Hemersh 45
4630 Bochum
Germany

Dr Lawrence DRAKE
From: North Ryde NSW
To: Observatorio San Calixto
Casilla 12656
La Paz Bolivia