



AUSTRALIAN SOCIETY OF EXPLORATION GEOPHYSICISTS

NEWSLETTER

Preview

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COMING EVENTS.

You are referred to the Calendar on the last page of Preview for dates of coming events.

ADELAIDE'88 JOINT ASEG/SEG CONFERENCE & EXHIBITION

FEBRUARY 14 - 21, 1988 - Adelaide Convention Centre

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The powerful Committee is storming ahead with preparations for what augurs to be the biggest Geophysical event of the southern hemisphere.

Exhibitors are advised that if they wish to participate, time should not be wasted as demand for space is high.

One hundred and fifty papers have been accepted with 40% of these coming from overseas.

Workshops covering Applied Geophysics in Engineering, Airborne Geophysics, Seismic Acquisition, Processing & Interpretation, P & S Wave Techniques, Borehole Geophysics, Electromagnetic Methods, and including official SEG Continuing Education Courses will be on offer.

The social functions that will be available include tours of the vineyards to the North and South of the city, cruise & dinner aboard the Matthew Flinders, dining out at a variety of fine restaurants and visits to museums & theatres.

Pre- and Post- Conference tours of the Red Centre, Gold Coast, Flinders Ranges, Kangaroo Island, Opal Fields, and the chance of an historic 3 day sail on the Flailie are on offer in conjunction with the Conference registration.

Registration rates which cover the major social functions including lunches, the Conference Dinner and the bound volume of Conference Proceedings, are:

Member	\$295	Late Member	\$345
Non-Member	\$320	Late Non-Member	\$370
Student	\$ 95	Day Registrant	\$150
Workshops	\$100/day (approx)		

Late registration fees would be charged after October 30, 1987.

1987 BMR SYMPOSIUM - "APPLIED EXTENSION TECTONICS" for the Mineral and Petroleum Exploration Industries to be held in Canberra, November 24 to 26, 1987.

The workshop will bring invited overseas and local experts together with BMR scientists to present and discuss three main topics:

1. The principles of extension tectonics
2. Petroleum and minerals in extensional basins
3. Igneous, Hydrothermal & ore-forming systems in extensional terranes.

Either ring Mrs Evelyn Young on 062-499563 or write to 1987 BMR Symposium, GPO Box 378, CANBERRA, ACT 2601.

SITUATIONS VACANT

LECTURER IN GEOPHYSICS UNIVERSITY OF QUEENSLAND, St Lucia, QLD, 4067 DEPARTMENT OF GEOLOGY & MINERALOGY (5 YEAR FIXED TERM)

Geophysicist with MSc or PhD and geological background: main duties, to share teaching & development of 4-year BSc App (Geophysics) and 1-year MSc App (Petroleum Geology & Geophysics) courses. Industrial experience an advantage; liaison with industry will be encouraged. Excellent research opportunities.

Closing date: July 30, 1987.

Contact Dr GR Orme or Dr Sydney Hall on 07-3772375

PERSONAL MOVEMENTS

Peter Elliott, the first Vice-President of the ASEG who very generously sponsored the AGM Issue of PREVIEW (#9), has left Billiton to set up SEARCH EXPLORATION SERVICES PTY LTD in Adelaide. The flier that was included with the last issue can now be amended such that the contact telephone number reads **08 - 79 3305**.

Dr Steve Hearn, late of Velocity Data has recently joined the Geophysics Department of Queensland University.

MEMBERSHIP:

If you haven't received your Notice of Subscription Dues for 1987/88 by now, please contact your State Branch Secretary or Terry Crabb, Federal Secretary on 08-2747619.

Those of you who haven't been receiving recent issues of the Bulletin could well be unfinancial or your address is incorrect. A call to Terry Crabb should be able to clarify the situation.

PUBLICATIONS:

All financial members should have received Volume 17, Issue 4 and Volume 18, Issue 1-2 within the last two months.

Volume 18 Issue 3 will be published and distributed by late August 1987.

This will be a special issue on downhole electro-magnetic methods.

Advertising for this issue closes by the end of July and should you wish to be included in this issue, contact Terry Crabb on 08-274 7619.

MCCRACKEN ELECTED A FELLOW OF THE AUSTRALIAN ACADEMY OF SCIENCE

Ken McCracken was elected a Fellow of the Australian Academy of Science (FAA) on 30 April 1987. This is the first occasion an election has been made to the Academy based (at least partly) on research work in Exploration Geophysics. Ken has had an impressive scientific career spanning work in Exploration Geophysics Cosmic Rays, X-Ray Astronomy and Space Science.

His contributions to Exploration Geophysics include:

The advantages of time domain.

He initiated research into the use of time domain techniques in electrical geophysics in 1970. This decision, while based on physical principles, was contrary to prevailing theory and practice at the time, and encountered much scepticism. In 1970 the key technology (the microprocessor) was not available, and the R&D was initiated in anticipation of that technology. Once it became available in 1974, a pre-operational system ("SIROTEM") was rapidly realised and tested extensively in collaboration with the Australian mining industry. It went into commercial production in 1977 and now commands 40% of the world market.

Time domain systems outside Geophysics use very narrow sampling windows, based upon a theoretical consequence of Thevins theorem. Ken recognised that this would maximise the systems sensitivity to random magnetic noise. Consequently SIROTEM uses wide contiguous sampling windows. This decision, taken in 1970, was probably the most important contribution to the success of SIROTEM.

From 1977, Ken investigated the factors that led to the practical superiority of time domain over frequency domain electromagnetic methods (the fourier transform being erroneously taken by some to indicate equality in all respects). By 1982, his work was widely recognised within Australia and overseas. Time domain EM now accounts for 99% of all EM methods used in minerals exploration in Australia.

Noise Effects

Noise is ubiquitous in EM systems yet there was little mention of it in the EM Geophysical literature until the late 1970's. In a series of graduate lectures given at Salt Lake City at that time, Ken drew attention to the numerical filtration effects of time domain EM, and to the various factors that contribute to noise in practice. This work was extended, and, through the medium of AMIRA, rapidly adopted by the minerals exploration community in Australia.

Further, Ken and his co-workers recognised the need to provide definitive data on EM noise as a function of time, location and polarisation. Their measurements revealed a 10^4 -fold variation, implying as yet unrecognised restrictions on the application and interpretation of EM throughout the world. This work led to a quantitative study of "geologic noise", and to the definition of optimum design procedures for EM surveys.

Ken McCracken was appointed as foundation Chief of the CSIRO Division of Mineral Physics in 1972. By 1974, the Division had a staff of 140, and had developed a strong relationship with the Australian Mining Industry. Under his leadership it had:

- licensed some 16 different devices or procedures to industry for commercialisation
- won two international prizes (US IR-100 awards for 1979 and 1984) for excellence in the development of high technology
- led to the total adoption of satellite based remote sensing by the Australian minerals industry
- seen two of its innovations become major contenders in the international market place (SIROTEM, SIROASH)
- contributed to the adoption by the Australian mining community of advanced mathematical methods for the inversion of geophysical data
- achieved a direct funding level in excess of \$1 million per annum from Australian and overseas industry.

by Mike McElhinny

The following discussion by rights should appear in "EXPLORATION GEOPHYSICS", however the next issue that could carry this discussion is Issue #4 of Volume 18 due out in December 1987. As a consequence, it was agreed to publish this in advance in the interests of topicality.

DISCUSSION by RJ Henderson

The Que River TEM Case-Study by G Staltari.
"EXPLORATION GEOPHYSICS", Volume 17, Issue 3.

I find it disappointing that this paper appearing as it has in 1987 should distinguish different commercial types of TEM on the basis that each is only capable of certain types of loop geometry. The reasons given for the success of UTEM in detecting the P lens (as slim as the evidence may be), stem only from its use in the large fixed transmitter loop geometry. SIROTEM has been capable of operating in this particular geometry since 1983. Unless the paper is to be only of historical interest it should reach conclusions appropriate at the time of writing. The author has stated to me in writing "I feel that any high power impulse system fixed loop survey would have detected the P lens." (Staltari 1987 pers comm). It is unfortunate that something to this effect was not included in the paper.

RJ Henderson.

REPLY by G Staltari

I had considered my paper to be balanced in its approach to reconciling the differences in response for the two systems/field configurations used. However I can appreciate that these differences may cause some workers concern. In general, the paper was intended as an historical account and should in no way be taken as an indictment on the capabilities of any particular system. The fact is that the interpretation of the UTEM data in 1978/79 resulted in a conclusion that the P lens was detected. The interpretation of the SIROTEM data during the same period resulted in the conclusion that the P lens was not distinguishable in the results. Readers

should, however, be aware that all TEM systems have undergone considerable changes since 1978 and in particular, many systems are capable of being employed under different transmitter loop-receiver configurations. In particular, SIROTEM has been capable of operating in the fixed loop mode for some time. This is not to say that all fixed loop systems are equally capable in respect of field portability, signal-to-noise efficiency, bandwidth, etc. For example, to this day, UTEM is preferred by most mining companies in the Que River district because of its superior field portability in the rugged terrain. On the other hand, SIROTEM is preferred by most mining companies in certain other parts of Australia because of its ability to work in the moving loop configuration.

I am interested in Roger's inference that the evidence for the detection of the P lens by UTEM is "slim". I think it would be more beneficial for Roger to outline his reasons for such an inference, particularly in view of the fact that an even more subtle anomaly led to the discovery of the Hellyer ore deposit. Any alternative interpretation would be very welcome, particularly by those geophysicists who are still attempting to locate new ore bodies in Western Tasmania.

G Staltari.

CONGRATULATIONS JIM! (see page 4).



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AN AUSTRALIAN GEOPHYSICS NEWSLETTER ?

INVITATION TO ASEG MEMBERS

The Specialist Group on Solid-Earth Geophysics (SG²) of the Geological Society of Australia publishes a Newsletter twice per year (June and December) which contains research news, reviews and current affairs of interest to geophysicists in Australia.

In an initiative designed to promote closer ties among all geophysicists, SG², with the support of the ASEG federal executive, invites ASEG members to subscribe to the Newsletter (\$12 per year). It is hoped that this move will open the Newsletter to wider geophysical interests.

The long-term objective is to publish a newsletter/magazine for geophysicists in the Australian region along the lines of "The Australian Physicist", "Chemistry in Australia", or "The Australian Geologist".

A FREE SAMPLE OF PREVIOUS NEWSLETTER ISSUES IS AVAILABLE ON REQUEST
FROM THE EDITOR, DR.D.M.FINLAYSON.

Please reply:

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I wish to subscribe to the SG² Newsletter and enclose \$12 for 1987 issues.

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Make cheques payable to the Specialist Group on Solid-Earth Geophysics.

Advanced Exploration Techniques: A Workshop Course

by
Dr. Mike Badley

A five-day workshop course on the practical application of advanced seismic interpretation and geological techniques to exploration and production problems facing geologists and geophysicists working in basins both off- and onshore. The course, based on a balanced combination of lectures and work sessions, demonstrates the application of advanced techniques using seismic sections, well and map data from a wide variety of basin types including examples from Australia.

COURSE CONTENT

Basin Analysis

Practical application of crustal scale models as interpretive tools to analyse basin evolution, subsidence, uplift, unconformities, thermal history, etc.

Seismic Interpretation and Structural Analysis

Seismic interpretation - resolution problems, structural styles, velocity analysis, depth conversion and map migration.

Sediment decompaction - methods and applications.

Section balancing - methods.

Fault analysis - including the application of fault displacement gradient contouring.

Salt structure analysis - a new approach.

Footwall uplift and unconformity analysis.

Advanced contouring - techniques.

WHO SHOULD ATTEND

The course is designed for geologists and geophysicists engaged in interpretation and technical management, and other professionals involved in exploration and production. The course is advanced and assumes a working knowledge of basic seismic interpretation techniques.

INSTRUCTOR

Dr. Mike Badley has been involved in exploration both as a geologist and seismic interpreter in North West European basins for the last 15 years. Since 1983 more than a thousand geologists and geophysicists have attended his courses *Practical Seismic Interpretation* and *Practical Exploration Techniques*, held at numerous locations in Europe, North America, S.E. Asia and Australia.

WHERE, WHEN AND HOW MUCH ?

The course is scheduled to be presented in Adelaide during the week 16 - 20 November. The price of the course is AS\$1400. Further details or enrollments can be made by telephone, telex or fax to: Badley, Ashton & Associates Ltd., Aveland House, Queen Street, Spilsby, Lincolnshire, PE 23 5JX, England.
Tel (0790) 52278: Fax (0790) 53818: Tlx 377854.

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