AUSTRALIAN SOCIETY OF EXPLORATION GEOPHYSICISTS

October 1990, Issue # 28

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Introduction

The "Leading Edge" issue of August 1990 has an article by Jack D Corbett on the decline (extinction?) of mineral geophysics in the USA.

Why, then, does Australia have 550 mineral geophysicists versus 100 in the USA? Why has our evolutionary path led to success, for the moment?

Is it because geological interpretation is emphasised in Australia, whereas geophysical methodology is stressed in the USA?

Our joint ASEG-GSA Conference in Sydney may provide some guides, in a rapidly changing environment.

The Federal Executive is concerned at the lack of membership growth of the Society and has requested the appointment of Membership Secretaries within all State Branches of the ASEG.

The function of Membership Secretaries will be to promote membership at all levels, including canvassing local students.

The Membership Secretary for the NSW Branch is Greg Blackburn of TCPL Resources, Level 4, Aetna Centre, 495 Victoria Avenue, Chatswood 2067 (Tel: 02-411 6933).

Preview is a bimonthly publication; the next issue is scheduled for print in December 1990. Deadlines for submission of articles and advertisements for each issue will be the 15th of the publication month.

Andre Lebel Guest Editor

Branch News

ACT

The ASEG Branch will be holding the October monthly meeting on Wednesday, 24 October at the Polish Ex-Servicemen's Association Club, Tobruk House, Moore Street, Civil (next door to the RSL Club). Drinks will be available from the bar at the club from 5.00 pm with the meeting and seminar commencing at 6.00 pm.

The guest speaker will be Professor Paul Morgan, (Northern Arizona University, Flagstaff). The title of the seminar talk will be "Archaean Heatflow".

Following the meeting, Paul will be the guest of the Branch for dinner at the Lantern Restaurant, in the RSL Club, next door to the Polish Club. Contact the Secretary (Kevin Wake-Dyster, 249 9401) if you wish to attend the dinner.

For those members anticipating a monthly meeting on 12 September, due to a combination of circumstances, the meeting was not held. However, the joint Christmas function with GSA is definitely on, with the dinner being held at The Restaurant, School of Tourism and Hospitality, Constitution Avenue, Reid, on Tuesday, 20 November, 1990, cost \$20 per head (incuding wine, with subsidisation by the ASEG and GSA). The speaker for the meeting is yet to be finalised. To ensure a ticket for the dinner, please contact the Secretary as soon as possible as tickets will be sold on a first come first served basis.

Spring BMR/ASEG Golf Tournament 1990

The Spring 1990 BMR-ASEG Golf Tournament will be held on Friday 2 November at the Belconnen Golf Course, hit-off from 12.30 pm. Entry for the tournament is \$2, payable at the course on the day, with green fees payable at the course as well. Contact Brian Barlow (249 9207) or Kevin Wake-Dyster (249 9401) if you wish to reserve a tee-off spot.

Kevin Wake-Dyster Secretary

QLD

Late in August, the Branch held an extra meeting to take advantage of a visit to Brisbane by Colin Barnett of Newmont Exploration Ltd. Colin gave an informative review of the activities of Newmont, and an overview of gold geophysics.

At the October meeting, Dr David Gust, Associate Professor and Head of Applied Geology, QUT, gave an interesting talk on "A Petrologist's View of Plate Boundaries". David joined QUT at the beginning of the year and will definitely be an asset to the Geology Department.

Forthcoming events include a two-day 'Sequence Stratigraphy School', inaugurated by the SA Branch, to be held mid-November. The Student's Night will be held late in November and the Christmas Party early in December.

A quick mention of personnel moves. The Branch is sad to lose three members. Ken Dups has moved to Trend Exploration in Jakarta, David Spring has moved to Petrofina in Melbourne and Brenton Oke has moved to BHP, also in Melbourne. We are particularly sorry to see Brenton go, as he was the Branch Secretary (volunteers are rare for that position!) Many thanks to Brenton for all his hard work.

Danny Burns Coerced Secretary!!

SA

The September meeting was held at the AMF where Bob Frears and Warwick Newton of SADME gave presentations on current exploration activity in South Australia from the petroleum and minerals viewpoint respectively. Our thanks to both these members for the effort they put into these presentations.

Our October meeting was delayed until the 24th and is to be held on the ground floor of 101 Grenfell Street. John Saunders of the NCPGG will follow up his earlier talk on the "Seismic data enhancement project" with some processed results from this project.

The ASEG Melbourne Cup Lunch has again been organised and is to be held at the "College Arms", Currie Street.

The usual Calcutta Sweep will be held and food and drinks will cost \$24. Starting time is 12.15 pm. If you wish to attend please contact either Nick Fitzgerald (08) 224 7953 or Neil Gibbins (08) 224 7305 as soon as possible.

For those of you who have ordered wine, you can expect to receive it later this month.

Nick Fitzgerald Secretary

VIC

On 11 September, Greg Beresford from the University of Melbourne spoke on Wave Equation Datuming. Results of applying the method to data from submarine canyon areas (Gippsland Basin) and surface reef areas (Bronse Basin) were shown.

On Thursday, 25 October, a joint meeting will be held with the GSA. The 'Selwyn Memorial Lecture' will be given by David Dunholm (BMR) titled 'Australian Seismicity - The Newcastle Earthquake and the puzzle of the not so stable Continent'.

David Gamble Secretary

WΔ

The beer tasting night was well attended and enthusiastically contested. With the notable exception of Tom Kerr, there was a marked decrease in accuracy as the night wore on. Tom, on the other hand, started badly and improved with time, to end up with one of the four beers in the final round correct. From comments on Brian Embleton's score sheet it would seem he has had some problems with a cat spraying his glass!

Functions rostered over the next few months include the Student's Night on October 24 and a presentation by Waveform on Ground Penetrating Radar on October 31. It is planned to have the Christmas Party at the trots this year - more later.

In other news Euan Clarke has moved from Tesla-10 to Aerodata and Rob Weeden at WMC is off to the US for a couple of years.

Kim Frankcombe Secretary

Scientific Exchanges with China-1991/92



The Australian Academy of Science supports scientific

exchanges with the People's Republic of China through an exchange programme with the Chinese Academy of Sciences (Academia Sinica). Scientists who are Australian citizens or permanent residents are invited to apply to participate in the programme between 1 July 1991 and 30 June 1992. Proposals in any field of natural science, basic and applied, will be considered. The primary purpose of the programme is to support collaborative research between Australian and Chinese scientists. Support will not be given when the primary purpose of the visit is to attend a conference.

Proposals must focus on visits to Academia Sinica institutes. A list of institutes is available from the Academy. Visits to non-Academia Sinica institutes are not encouraged and subject to approval by Academia Sinica. Proposals may be for short term visits (3-6 weeks) to collaborate with Chinese scientists or longer-term visits to carry out more extensive research projects. Due to financial restrictions extensive travel and field surveys in China are difficult to arrange.

Applicants should propose a scientific programme or project, which has been developed in consultation with scientists in the institutes they wish to visit. Proposals should describe the nature of activities to be carried out and the objective of the visit. If lectures are to be presented, topics and titles should be given.

Letters of invitation from Chinese scientists to be visited must be submitted with applications. A principal host must agree to co-ordinate the visit in consultation with Academia Sinica.

Selection criteria include scientific merit of the proposal, contribution to the development of the scientific discipline, potential for expanding contacts and initiating collaboration with Academia Sinica

Applicants are asked to state why the work they propose to do would best be done in China and to discuss how the work would benefit Australia.

Under the terms of the exchange agreement, the Academy provides an excursion international air fare and Academia Sinica arranges and pays for accommodation, board and travel within China.

The exchange programme is funded by the Australian Government.

Application forms and a list of institutes are available from:

International Exchanges Officer Australian Academy of Science GPO Box 783 CANBERRA ACT 2601 Telephone enquires: (06) 274 3966 Bonnie Bauld

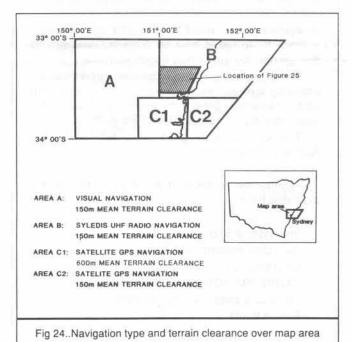
Sydney Airborne Geophysical Survey

Reprinted from Department of Minerals and Energy MINFO NSW Mining & Exploration Quarterly No. 28

The regional aeromagnetic coverage of New South Wales has been completed with the flying of the Sydney airborne geophysical survey. Both magnetic and radiometric measurements were recorded during the survey, which included the onshore portion of the Sydney 1:250,000 sheet and an offshore component extending to the edge of the continental shelf.

For this survey both UHF radio navigation and satellite GPS(Global Positioning System) were used for navigation offshore and for the eastern onshore area(figure 24). Visual navigation was the most appropriate aircraft tracking system for the rugged western area of the sheet.

The survey parameters are compatible with those used in most of the other regional airborne surveys conducted in New South Wales. The survey flights were flown in an east-west direction at a spacing of 1.5 km. Due to Civil Aviation Authorities regulations, the terrain clearance over Sydney metropolitan region was maintained at 600m and this area of the survey (Area C1, figure 24) was flown late at night using satellite navigation to expedite survey progress during the curfew hours for commercial aircraft.



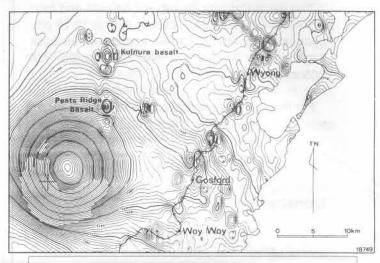


Fig 25. Portion of the Sydney 1:250,000 magnetic contour map

The Magnetic data have been gridded and contoured at 1:250,000 scale, with the entire survey area presented as a single map using both single-colour and multi-colour contours. Figure 25 illustrates a portion of the 1:250,000 magnetic contour map. The prominent circular anomaly appears to be a large magnetic intrusion beneath the sediments of the Sydney Basin; the depth of the intrusion is thought to be at least 5 km. Volcanic material exposed in quarries at Peats Ridge and Kulnara are reflected as intense small-scale magnetic anomalies. The direct currents associated with the north-south electrified rail line are responsible for a curvi-linear feature which appears as a series of small circular complex anomalies in figure 25.

The magnetic and the radiometric data are available as a package of digital data and regional scale maps.

For further information contact Dr Ted Tyne, Principal Geophysicist, on (02) 901 8342 or Ross Spencer, Geophysicist, on (02) 901 8364.

Southern Geoscience Consultants

8 Kearns Crescent Ardross, Western Australia 6153

PC-IP AN INTERACTIVE DIPOLE-DIPOLE MODELLING PROGRAM

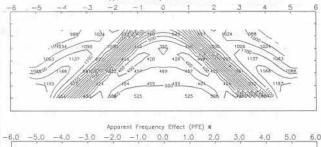
PC-IP

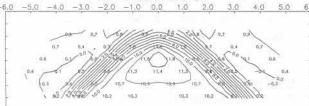
The software is based on Rijo's finite element algorithm.

Features of the software include:

- interactive operation
- graphical input and editing of bodies
- multiple bodies of arbitrary cross section
- allows topographic variations
- screen/printer pseudosections of apparent resistivity, pfe and metal factor
- output xyz files in a format suitable for input to SURFER (Golden Software) for contouring etc.
- runs on any IBM compatible with 640k RAM available
- run times are less than 3 minutes on a 386 machine with a math co-processor
- multiple help screens
- full colour

The software is available as a single machine licence (\$1,800) or a multiple machine licence (\$5.500). Examples of output are shown below.





Southern Geoscience Consultants

Telephone: (09) 316 2801/316 2814 Facsimile: (09) 316 1624

State Geological Surveys

WA

The Western Australian Geological Survey has added some surveys and put a "Search and Print" front-end to its catalogue of open-file airborne geophysical surveys. Call David Howard or Lazlo Kevi on (09) 222 3333 for further details.

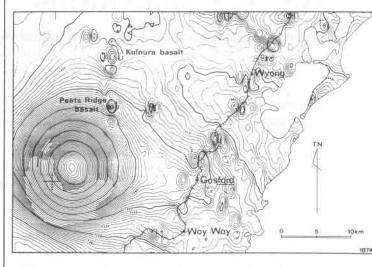
NT

The Northern Territory Geological Survey advise that flying of six 1:100,000 sheets in East Arnhem Land - the Mitchell Range Survey - was completed in early October. Progressive releases of the magnetic and radiometric data are due to start in March or April 1991. Ring Ted Findhammer in Darwin on (089) 89 5511 for more information.

NSW

PREVIEW has published this magnetic contour map to assist geophysicists who want to attend the Sydney Conference, but have navigational problems.

PREVIEW advises those who do not understand the map to ask the nearest homing pigeon for instructions!



1991 ASEG-GSA Conference and Exhibition

Golf Day

The Conference Golf Day will be held on Friday 22 February 1991 at one of Sydney's top flight courses. Please indicate your interest in this event on the Conference registration form.

Equipment can be arranged for players requiring it.

Video Room

There is still provision for including suitable video material for screening in the Conference Video Room.

For further information please contact:

Barry Smith c/- Conference Action PO Box 925 Crows Nest NSW 2065 Tel: (02) 488 9588

> Barry Smith Conference Organising Committee

ASEG Publications

- #1. The Geophysics Of The Elura Orebody. Proceedings of the Symposium, edited by DW Emerson, Sydney, 1980; 205p A complete case history highly regarded by explorers, it consists of a collection of papers with discussion, on the exploration, discovery, evaluation and testing of a large massive sulphide orebody in deeply weathered and conductive terrain near Cobar, NSW, Australia. Price \$31.00
- #2. Magnetic Exploration Models incorporating Remanence, Demagnetisation and Anisotropy, by DW Emerson, DA Clark and SJ Saul, 1985: 122p A unique presentation of magnetic computational techniques for forward modelling 15 types of simple yet important geometric bodies ranging from the monopole through thin and thick sheets to the triaxial ellipsoid. Its purpose is as a working compendium

of techniques primarily designed to teach and to impart some understanding of the magnetic response of basic models. This is the only available collection of rigorously treated MAGMODS and comes with HP41C programmes and worked numerical examples. Price \$25.00

- #3: Downhole Electromagnetics edited by ET Eadie & G Staltari, 1987: 105p Consists of case histories, TEM theory and short notes presented at a Workshop on this subject held in Melbourne in 1985. It provides an excellent summary of the technique and its utilisation in Australia. Price \$40.00
- #4: ASEG Publications Index, 1970-1987, 94p plus MICROFICHE, covering "ASEG Bulletin, EXPLORATION GEOPHYSICS" plus Conference papers and Abstracts. Price INDEX \$40.00, MICROFICHE \$300.00. Free publication Index with every complete set of microfiche ordered.

Geomagnetism In An Australian Setting edited by FEM Lilley and CE Barton, 1986; Volume 17, Issue 1. 58 p - Papers on fundamental aspects of geomagnetism some of which are directly relevant to exploration. Price \$25.00

Conference Issues: Many excellent, short but detailed papers on applied geophysical subjects from mineral, petroleum and other fields.

- #1. Special Brisbane Conference Issue, 3rd Geophysical Conference and Exhibition, Brisbane, October 30 - November 3, 1983. Extended Abstracts. Price \$25.00
- #2: Volume 16, Issue 2/3, 177p 4th Geophysical Conference and Exhibition, Sydney, September 9-12, 1985. Extended Abstracts. Edited by PJ Gunn. Price \$25.00
- #3: Volume 18, Issue 1/2, 245p 5th Geophysical Conference and Exhibition, Perth, February 22-27, 1987. Extended Abstracts. Edited by MF Middleton, D Pridmore. Price \$30.00
- #4: Volume 19, Issue 1/2, 400p ASEG/SEG Conference and Exhibition Adelaide, February 14-28, 1988. Extended Abstracts. Edited by MP Middleton. Price \$45.00.

These publications can be obtained from Brackett Secretariat, ASEG Publishers, PO Box 44, Eastwood SA 5063.

The TOMEX® Survey

A Tool to Aid in the Prediction of Formation Tops Ahead of the Drill Bit

How TOMEX Works

The TOMEX technique uses the vibrations created by a rotary drilling roller-cone bit to obtain borehole seismic data. TOMEX drill-bit seismic data are acquired without any downhole instrumentation and the data recording does not interfere with drilling operation. The drill-bit vibrations are emitted as a sequence of impulses that travel up the drillstring and are recorded by a pilot sensor attached to the top of he drillstring. Geophone or hydrophone arrays deployed near the surface record the drill-bit impulses travelling via direct and reflected raypaths through the earth. As shown in Figure 1, the pilot signal is cross-correlated with the geophone or hydrophone signals to compute the arrival times of drill-bit events and to attenuate incoherent noise. The cross-correlated data are then compensated to remove the effects caused by using a pilot sensor location distant from the drill-bit energy source. The TOMEX technique has successfully obtained drill-bit signals on over 50 wells worldwide in all types of lithologies, depths to 18000 ft, in wells deviated up to 60 degrees.

The drill bit seismic data obtained in the TOMEX technique have several advantages over conventional borehole seismic techniques such as checkshot or VSP surveys. Since the TOMEX data are acquired without any downhole instrumentation, the lost rig time and concerns about borehole condition inherent in wireline surveys are eliminated. The cost advantage is particularly important to the drilling engineer in remote or offshore areas where drilling costs are high. TOMEX adds to the arsenal of MWD (measurement while drilling) tools available to the wellsite geoscientists and the drilling engineer. By integrating drill-bit data with other information such as seismic reflection data, MWD logs, or mudlogs, improved formation top depth predictions can be made. These improved predictions can be used by the drilling engineer to update the drilling plan and improve drilling efficiency.

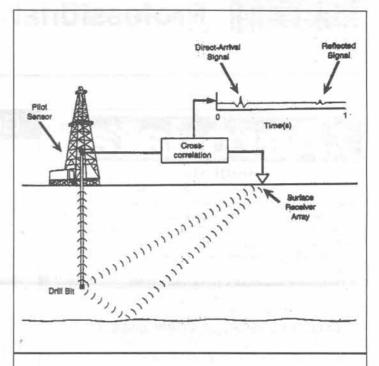


Figure 1: TOMEX Survey Concept

Summary

TOMEX uses the continuous, impulsive vibrations produced by a rotary-drilling, roller-cone bit as a seismic energy source.

The drill-bit signals are recorded at the surface, with no downhole instrumentation necessary.

The drill-bit signals are processed to produce real-time data that can be used by a wellsite geoscientist to update formation tops.

A drilling report can also be provided to the drilling engineer which updates formation tops, integrating the TOMEX data, the initial formation top picks, and the initial depth conversion method.

More detailed information can be obtained from Steve Pickering, Geophysical Co-ordinator, Western Geophysical Tel: (09) 353 1999 Fax: (09) 353 3963 or Gary Ryer, Area Manager, Atlas Wireline Services Jakarta Tel: 780 1430 Fax: 780 0750.

Sydney Conference 1991



Your hardworking (and we wish we could say tireless, but can't) committee continues to gain new respect and admiration for all those who have done this before. There's a "sea of details" out there that seem to keep materialising and dates that keep getting closer - faster.

When we started all this planning some two years ago, this conference was just something on the horizon - NOW IT'S GETTING CLOSE - PEOPLE ARE ACTUALLY REGISTERING AND SENDING MONEY.

A few aspects of the conference probably warrant special note to the ASEG membership. We've been working with these items ourselves for so long that we think "everyone knows that" - but perhaps that's not the case.

The Conference is a joint undertaking with the Geological Society of Australia (GSA). It is hoped that only benefits will accrue from this arrangement - a broader technical programme will be presented and more delegates will attend. The larger attendance allows us to select a venue which can accommodate a large exhibition, where "state of the art" technology can be exchanged - more delegates should attend to participate in the exhibition. This allows us to keep our registration cost per delegate down; which we deemed necessary.

We hope to make the Conference Breakfast a regular event at ASEG conferences. Harry Butler, the speaker at the breakfast, is bound to provide something we can all think about. Breakfast overlooking the harbour can be a good way to start the day.

"Something" special has been arranged (no lies) for the Conference Dinner, but in keeping with tradition, we can't tell you about it.

The workshops and short courses are arranged such that no financial liability accrues to the Societies - they are all 'stand alone' functions. However, they are planned to tie into Conference scheduling. The 6 short courses/workshops organised offer good

value; give very serious consideration to attending at least one of these.

We've had no suggestions on how to organise the Sydney weather yet - it's a big load to shoulder!

Register now - see you in February.

Wes Jamieson Tim Pippett Conference Co-Chairmen



BENEFITS OF

ASEG CORPORATE MEMBERSHIP

- ☐ ACKNOWLEDGEMENT WITH AN OFFICIAL ASEG PUBLICATION
- PRIORITY ALLOCATION OF BOOTHS AT CONFERENCES
- COPY OF ALL ASEG
- DISCOUNTED ADVERTISING RATES

For further information contact:

The Secretariat 7th floor 12 St George's Terrace PERTH WA 6000 (09) 325 2955



The Professional Institute for all Geoscientists

AIG needs your support. It needs a large ACTIVE membership so it can truly be a strong representative voice and a credible organisation. Don't rely on overseas organisations to represent you or expect some other profession's organisation to represent the geosciences fairly.

Join AIG now!

Professional recognition doesn't just happen, it has to be made to happen through the ethical conduct of the members of the profession, and representation of the professionals by a strong representative professional body. This is exactly why the Geological Society of Australia, The Australian Society of Exploration Geophysicists and the Petroleum Exploration Society of Australia banded together to initiate the formation of the Australian Institute of Geoscientists.

AIG is here to enhance the professional status of geoscientists in Australia; it is an Australian institute, not foreign; it represents only geoscientists and is only concerned with professional matters and educational standards.

If you feel that as a geoscientist you make a worthwhile contribution to Australia, that you would like to see the geoscientific profession properly recognised and respected and you care about ethics within the profession, then apply to join AIG now, and support your state branch.

The future of the geoscientific profession is up to us! Apathy will guarantee its demise!

There are 4 AIG membership levels - Fellow, Member, Graduate Member and Undergraduate Member. For more information and application forms to join AIG please contact:

The Secretary
Australian Institute of Geoscientists
c/- Geological Society of Australia
10 Martin Place
SYDNEY NSW 2000

ASEG Research Foundation

The aim of the ASEG Research Foundation is to support research into *exploration geophysics*, via approved research projects at B.Sc. Hons. and M.Sc. level in Australian tertiary institutions. In order to do so, we invite financial contributions from members, companies and other professional societies. The ASEG Research Foundation is an Approved Research Institute, consequently *all contributions are tax deductible*. In addition, of course, all contributions will be acknowledged in "Preview".

Joe Cucuzza Secretary

	ASEG RESEARCH FOUNDATION
P	ost to: Treasurer, ASEG Research Foundation, N. Hungerford, Billiton Australia, PO Box 872K, Melbourne Vic 3001
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	ADDRESS: (for receipt purposes)
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(This form should be retained for tax purposes)

Membership

We welcome new members to the Society:

Category State Member

LEKAUNYANE, M Student WA McCUE, KF Active ACT

Unknown addresses

We do not have the correct addresses for the following members. Can you help?

Brian Milner

Schnabel Engineering last known address:

Richmond Virginia, USA

Mr M D McNicol

last known address:

68 Johns Crescent MOUNT EVELYN VIC

Mr M G Siebert

last known address:

Santos Ltd GPO Box 2319 ADELAIDE SA 5001

Mr G S Jennings

last known address:

BMR, Canberra ACT

AGIP Australia

last known address:

83 Clarence St

SYDNEY NSW 2000

Mr S P Bronskill

last known address:

Battelle Management

Signal Drive Naperville ILLINOIS USA

Mr B D Emmett

last known address:

Ampol Exploration USA

c/- PO Box 661

NORTH SYDNEY NSW

Please contact Paula Sinclair (09) 325 2955 if you are able to provide a current contact for any of the above.

Change of Address

C Stricklin New address

> 9036 N Lamar Blvd #147 Austin TX 78753-5072

USA

From QLD to VIC - New address: D Spring

Petrofina Exploration Australia SA

Level 2, 476 St Kilda Rd MELBOURNE VIC 3004

D Cowan New address:

c/- Cowan Geodata Services

12 Edna Road DALKEITH WA 6009

C K Chua New address:

> 54 San Miguel Drive LEEMING WA 6155

C Foss New address:

167-2 Block H, Rampai Court

Setapak

Kuala Lumpur 53300

MALAYSIA





P.S. We note that you sent your story by first class mail.





We welcome any feedback members have on PREVIEW - its presentation, content and distribution.

PREVIEW has a circulation of about 900, with an audience in excess of that. Contributions are most welcome from members. Just contact the editor.