

AUSTRALIAN SOCIETY OF



EXPLORATION GEOPHYSICISTS

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INTRODUCTION

The Editor.

This Christmas edition of Preview is to give members advance notice of the forthcoming Society AGM and nominations for new committee members.

If anyone is interested in helping out with, or contributing, an article to PREVIEW they are welcome to do so. It is my intention to try and avoid the "Western Australian bias", so let's hear from you.

May you all enjoy the Christmas festivities.

Seasons Greetings.



News Update: ASEG RESEARCH FOUNDATION

*By R J Smith
Chairman*

ASEG Research Foundation Committee

The ASEG Research Foundation commenced its existence with a meeting of the Research Foundation Committee on 25 September, during the Melbourne ASEG Conference.

An application for recognition as an Approved Research Institute has been made and final approval is expected before Christmas. This will make donations to the Research Foundation tax deductible. Donations will be solicited in the near future and support for geophysical exploration research should commence in 1990.

ASEG BRANCH NEWS

A.C.T.

Golf

The 1989 ASEG Spring Golf Classic was held on Tuesday 2 November at Belconnen Golf Course.

ASEG Conference

The 1989 ASEG Conference was a great success. Despite the airline problems, over 400 delegates attended. The standard of papers and technical exhibits (including one from the BMR Marine Division) were first rate.

As some of you may already be aware, the ACT Branch was unsuccessful in its bid to hold the 9th ASEG Conference in 1992. The submission, prepared by Peter Napier, was well received and the Canberra Convention Centre recognised as ideally suited to ASEG's requirements. It was felt that the lack of an industry base in Canberra would necessitate a heavy reliance on the Sydney Branch which would be just getting over their 1991 Conference. We have been invited to apply for the 10th ASEG Conference in 1994 (anyone still expect to be here?). We wish Barry Long and the Brisbane committee all the best for 1992.

Branch Meetings

It is getting increasingly more difficult to find speakers who are non-seismic, non-BMR or we haven't already heard from. If anyone knows of potential speakers visiting Canberra, please let us know about them, and the committee will chase them up. We endeavour to cover as wide a spectrum of geophysics as possible, but with most of the committee consisting of seismic processors it is hard to keep track of happenings in other fields.

Christmas Function

The Christmas Function will be held at The Boardroom, Belconnen on Tuesday, 12 December 1989 at 8.00 p.m. Cost will be \$20.00 per person. It is a joint GSA-ASEG function. The guest speaker will be Dr David Denham, Chief of Geophysics Observatories and Mapping Group (and present ASEG golf champion!). Tickets for this function can be purchased from Mike Sexton (499543) and Tim Barton (499448).

*Mike Sexton
Acting Secretary.*

Student's Night

The NSW Branch held their inaugural "Student Night" on the evening 3 October in the Rugby Club, Sydney. Three students from the universities of Sydney, Macquarie and New South Wales gave 15 minute presentations concerning a variety of geophysical topics currently being studied. The night was a great success and most rewarding for all concerned. It is now ensured that the Student Night will become a regular event in the branch calendar.

Resignation

During October, Stephen Greaves tendered his resignation as President of the ASEG NSW Branch. He and his family have since moved to New Zealand. His enthusiastic contributions to the branch, as well as his friendship, will be sorely missed by all those concerned with the branch.

Student's Night

One of the aims of the ASEG is to promote the teaching and research of geophysics at our universities. In line with this aim the Branch organised a meeting where members can hear presentations from four honours students from Queensland University. The students gave a short presentation of their honours thesis. Members had the opportunity to see what type of projects are being pursued at the University and the calibre of students due to enter the industry.

The Student's Night, scheduled for Tuesday, 5 December, 1989 had the following speakers:

- Ross Brodie: *Equivalent Source Techniques in Gravity Exploration*
- Terry Folkers: *Resolution of Multisource Potential Field Anomalies Using Poisson's Theorem.*
- Troy Peters: *Prediction of Shallow Reflection Data Quality from Refraction Q Measurements.*
- Michael Szczepaniak: *Evaluation of Seismic Trace Inversion Algorithms.*

Melbourne Cup

The Melbourne Cup Luncheon was held on Tuesday, 7 November at the Waymouth Tavern and was a great success. Guest speaker Eric Freeman entertained the crowd until, after a slow start, the bidding became spirited in the Calcutta Sweep run by Andy McGee. The undersigned rejects attempts for a steward's enquiry into how he, McGee, and Neil Gibbins bought half the winning horse from Jim Frazer for only \$5.00!!

ASEG Wine

The ASEG wine has arrived and anyone who has not picked up their wine may do so from the AMF. I've tried the red and it tastes as though it will cellar quite well - if it lasts that long! Neil Gibbins and friends vouch for the white.

Christmas Function

The final function for the year will be the Christmas Party to be held on 20 December at John Hughes' residence, 11 Plymouth Avenue, Blackwood.

Student's Night

The South Australian Branch Student's Night was held at the Australian Mineral Foundation on Wednesday, 29 November, 1989.

There were four speakers (three from Adelaide University and one from Flinders University) with topics varying from Geomagnetism and Geostatistics to Seismic.

Below are three of the abstracts presented.

1. The Application of Interpretive Improvement Techniques and Monte Carlo Technique of Simulated Annealing to Residual Statics Estimation

By Gerard M McNeill

The estimation of large residual statics in noise contaminated data poses a serious problem for normal traveltimes inversion techniques. These techniques are often plagued by gross errors in time delay picks chosen and so display cycle skipping problems.

This thesis begins by outlining the nonlinear inverse problem of residual statics estimation. A linear iterative improvement technique, Stackpower Maximization, is examined and its limitations discussed. The fully non-linear approach adopted

by Rothman (1985) is then outlined and applied, along with the linear technique, and results are compared between the two techniques.

Rothman (1985) employed a Metropolis technique, which simulates the annealing of crystals, to randomly update statics arrays iteratively until convergence to the optimal stack occurs. This technique has no reliance upon initial statics estimation and thus avoids convergence to local minima due to poor time delay picks.

The importance of temperature function used as well as initial temperature choice is investigated along with the effects of using differing random sequences to generate static shifts. The effects of applying constraints in stack-power maximisation are investigated. Finally there is a discussion of the use of random sequences in a controlled monte carlo procedure.

2. Aeromagnetic Anomaly over the Talisker Mine Area on Southern Fleurieu Peninsula, South Australia

By Leslie M Harvey, B.Sc, B.Sc. (Ma)

A N-E striking elongate aeromagnetic anomaly is observed over the Talisker Mine area, on the Southern Fleurieu Peninsula, which has character and amplitude similar to an anomaly observed at Delamere (several kilometres to the north) found to be caused by magnetic Brachina Formation. Geological and geophysical techniques have been used to determine if the rock type at Talisker is also magnetic Brachina Formation, why there is a gap between the two anomalies, and why the anomaly at Talisker ends near the south coast.

Geological mapping, microscopy and petrologic studies have been used in conjunction with local ground magnetic surveys and modelling procedures, to reveal magnetic Brachina Formation as the cause of the anomaly at Talisker. Mapping has shown the anomaly to be result of a sliver of magnetic Brachina Formation caught up within a local zone of intense deformation that extends for at least 1500m across strike, and which outcrops on the south coast. The Brachina Formation is sheared out against Cambrian Backstairs Passage Formation to the south and west, forming the southern end of the anomaly. To the north, the Brachina Formation suffered deeper erosion during Permian times, and is covered by a greater thickness of non-magnetic cover which causes the apparent gap in the aeromagnetic anomaly.

3. The Effect of Geomagnetic Induction Anomalies on Aeromagnetic Surveys

By Jonathon M Whellams

Fluctuations in the geomagnetic field, due in the daily variation or geomagnetic storms, induce electrical currents in the subsurface conductive zones. These induced currents generate their own magnetic fields which add to the observed fluctuation field causing it to be spatially inhomogeneous. A magnetometer array deposited in the Canning Basin, Western Australia in 1985 delineated a large conductivity anomaly extending right across the basin. This magnetometer array provided a data set with which it was possible to study the effects of spatially inhomogeneous fluctuation field on aeromagnetic surveys. In this study the array data set was used to simulate aeromagnetic surveys which use only a single base station to correct for time variations of the earth's magnetic field. It was found that even on magnetically quiet days fictitious anomalies of the order of 20 nT crept into the simulated survey data. Even standard tie line levelling techniques failed to remove errors caused by induction effects suggesting that arrays of base stations should be used.

Mark Flynn
Secretary.

W.A.

Student's Night

The following is the winning abstract presented at the recent Student's Night.

A Modelling Study on the Appearance of Mode Converted Events on Stacked Sections and Vertical Seismic Profiles

By Robert Jeffrey Mueller, B.App.Sc
(Curtin University)

The first semester's work centred around the testing and verification of SIERRA programs, the consequence of conventional P wave processing on converted events and an investigation on the appearance of P-SV converted events within surface data.

To be able to investigate P-SV conversions requires that the software being used is first tested to the extent that the user is totally satisfied that its calculation of amplitudes, phase lags and travel paths is correct. If its treatment of these parameters

is incorrect, then one at least needs to have a complete understanding of the deficiencies of the program. After rigorous testing of SIERRA programs, by comparison of synthetic data with real data, and comparison of amplitude and phase behaviour with the expected behaviour, it was decided that SIERRA's calculation of amplitude and phase, with angle of incidence, is acceptable.

The main problem with seismic rays which leave the surface as a compressional wave and return as a shear wave is that they have an asymmetric raypath, resulting in the reflection points within a conventionally sorted CDP gather not being midpoints. Thus a modified sort is required, based on detailed knowledge of the subsurface geology, and the origin of the shear wave energy.

Travel times for converted events are non-hyperbolic, and this coupled with the extreme offsets required for maximum shear wave conversion, results in poor NMO correction, using the conventional NMO equation. Also, far offset traces are affected by phase lag, which may be a useful property in itself, but will badly distort the final wavelet if included in the stack.

Terry Walker
Secretary.

NOTICE OF AGM

by Greg Street
President

The Annual General Meeting of the Australian Society of Exploration Geophysicists will be held in the River Room of the Raffles Hotel, Canning Highway, Applecross on Wednesday, 27 February, 1990 at 4.00 p.m.

The ASEG nominating committee consisting of the President and the two most recent past presidents has nominated an incoming Executive [ASEG Articles, Item 49 (i) to (iii)].

President: Brian Embleton, CSIRO
1st Vice President: Mike Sayers, WAPET
2nd Vice President: Greg Steemson, Metana
Treasurer: Craig Dempsey, Marathon

In addition, the following persons have agreed to serve on the Executive Committee:

Secretary: Andre Lebel, Consultant
Hon. Editor: Don Emerson, Sydney Uni
Editor of Preview: Anita Heath, Consultant
Members: Norm Uren, Curtin Uni
Eve Howell, Bond Petroleum

The President remains on the committee as past president. The Federal Executive meeting of 6 December, 1989 decided that an expanded Executive would be more efficient for 1990. This, hopefully, will allow us to complete some of the items that are outstanding from 1989 and to be more involved in other issues of interest to members.

It was decided that an expanded committee should have members with specific responsibilities for such items as:

1. Liaison with other Australian Societies
2. International affairs
3. Business manager
4. Assistant and membership secretary

Nominations are therefore requested for another two committee members.

In addition, the nominating committee is required to nominate district representatives for the S.E.G. Normally these would be the incoming president and two past presidents, provided all are members of the SEG. Eve Howell is not an SEG member and so we nominate as SEG council members: Brian Embleton, Greg Street and Norm Uren.

FINANCIAL STATEMENTS

For the nine months ended 31 December 1988

Auditor's Report

Auditor's Report to the Members of the Australian Society of Exploration Geophysicists

(Incorporated in NSW and Limited by Guarantee)

I have audited the accounts set out on pages ... to ... in accordance with Australian Auditing Standards.

In my opinion

(a) the accounts are properly drawn up in accordance with the provisions of the Companies (Western Australia) Code and so as to give a true and fair view of:

i. the state of affairs of the Company as at 31 December 1989 and of the results of the Company for the year ended on that data so far as they concern members of the Company; and

ii. the other matters required by Section 269 of that Code to be dealt with in the accounts;

(b) the accounting records and other records and the registers required by the Company have been properly kept in accordance with the provisions of that Code and applicable approved Accounting standards and Australian Accounting Standards.

COLIN JOHNSON AASA CPA
Registered Company Auditor

Profit and Loss Account

AUSTRALIAN SOCIETY OF EXPLORATION GEOPHYSICISTS
(Incorp. in N.S.W. and Limited by Guarantee)

PROFIT & LOSS ACCOUNT FOR THE NINE MONTHS ENDED 31 DECEMBER 1988

Note	Nine months ended 31.12.88	Year ended 31.03.88
	(\$)	(\$)
INCOME		
Membership Dues	54,763	35,411
Wines and Ties	1,045	491
Bulletin and Video Tape Sales	1,471	868
Donations - Sands Memorial	-	4,000
Non-member Subscriptions	3,540	7,480
Advertising	6,218	8,737
Excess Surplus WA 87 Conference	-	24,246
Estimated Deficit SA 88 Conference	-	(48,000)
Interest	9,161	13,252
State Branch Revenue 1d, 2		
South Australia	19,615	-
Queensland	5,501	-
New South Wales	6,947	-
Tasmania	108	-
Western Australia	4,669	-
A C T	1,358	-
Victoria	1,234	-
TOTAL INCOME	115,630	46,485
LESS EXPENSES		
Accountancy Fees	2,200	175
Audit Costs	2,000	100
Awards - Students	50	1,007
Bank Charges	933	935
Book Purchased	10	-
Capitation Fees	7,881	5,152
Computer Expenses	720	-
Depreciation	552	900
Donations	-	170
Inhouse Filing System	-	929
Loss On S.A. '88 Conference	4,555	-
Legal Expenses	1,646	-
Postage, Stationery, Sec. etc	4,585	12,293
Plant Written Off	210	-
Publication Expenses 3	17,893	408
Social Func., AGM Costs & Ties	200	7,420
Subscriptions	1,025	-
Corporate Affairs Fees	-	458
State Branch Expenditure 1d, 4		
South Australia	19,173	-
Queensland	5,208	-
New South Wales	4,272	-
Western Australia	4,241	-
A C T	505	-
Victoria	2,250	-
TOTAL EXPENSES	80,109	37,747

AUSTRALIAN SOCIETY OF EXPLORATION GEOPHYSICISTS
(Incorp. in N.S.W. and Limited by Guarantee)

PROFIT & LOSS ACCOUNT FOR THE NINE MONTHS ENDED 31 DECEMBER 1988

	Nine months ended 31.12.88	Year ended 31.03.88
	(\$)	(\$)
NET PROFIT	35,521	8,738

AUSTRALIAN SOCIETY OF EXPLORATION GEOPHYSICISTS
(Incorp. in N.S.W. and Limited by Guarantee)

PROFIT AND LOSS ACCOUNT FOR THE NINE MONTHS ENDED 31 DECEMBER 1988

	Nine months ended 31.12.88	Year ended 31.03.88
	(\$)	(\$)
Operating Profit	35,521	8,738
Income Tax Attributable to Operating Profit	-	-
Operating Profit After Income tax	35,521	8,738
Retained Profits at 1 April 1988	106,372	97,634
Retained Profits at 31 December 1988	141,893	106,372

Balance Sheet

AUSTRALIAN SOCIETY OF EXPLORATION GEOPHYSICISTS
(Incorp. in N.S.W. and Limited by Guarantee)

BALANCE SHEET
AS AT 31 DECEMBER 1988

	Note	Nine months ended 31.12.88 (\$)	Year ended 31.03.88 (\$)
CURRENT ASSETS			
Cash	1d, 7	72,881	27,771
Receivables	8	47,091	22,000
Inventories	9	7,000	7,000
Other	10	57,066	79,386
TOTAL CURRENT ASSETS		184,038	136,157
NON CURRENT ASSETS			
Plant and Equipment	11	363	1,125
TOTAL NON CURRENT ASSETS		363	1,125
TOTAL ASSETS		184,401	137,282
CURRENT LIABILITIES			
Trade Creditors & Accruals		7,504	23,910
Other	12	-	7,000
TOTAL CURRENT LIABILITIES		7,504	30,910
TOTAL LIABILITIES		7,504	30,910
NET ASSETS		176,897	106,372
MEMBERS EQUITY			
Reserves	1d, 13	35,004	-
Retained Profits		141,893	106,372
TOTAL MEMBERS EQUITY		176,897	106,372

Notes to and Forming Part of the Accounts

AUSTRALIAN SOCIETY OF EXPLORATION GEOPHYSICISTS
(Incorp. in N.S.W. and Limited by Guarantee)

NOTES TO AND FORMING PART OF THE ACCOUNTS
FOR THE NINE MONTHS ENDED 31 DECEMBER 1988

SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

(a) General Principles of Accounting

The accounts have been prepared under the historical cost convention and have not been adjusted to take account of either changes in the general purchasing power of the Australian dollar or changes in the prices of specific assets except to the extent that the revaluation of certain assets, as noted in the accounts, partially reflects such changes.

(b) Depreciation

Non-current assets other than freehold land and buildings are depreciated over their estimated useful lives using either the straight line method or diminishing value method of depreciation.

(c) Change of Financial Year

The Members of the Company passed a special resolution in 1988 to change the financial year from ending on 31 March to ending on 31 December. Consequently, the reporting period is only of a duration of nine months and the membership year was adjusted accordingly.

(d) Funds Held By State Branches

In the previous financial year the financial accounts of the Company did not reflect funds belonging to the Company but held by State Branches.

The financial accounts as at 31 December 1988 now show an Asset Revaluation Reserve (see also note 5) created to introduce these opening balances as at 31 March 1988.

AUSTRALIAN SOCIETY OF EXPLORATION GEOPHYSICISTS
(Incorp. in N.S.W. and Limited by Guarantee)

NOTES TO AND FORMING PART OF THE ACCOUNTS
FOR THE NINE MONTHS ENDED 31 DECEMBER 1988

		Nine months ended 31.12.88 \$	Year ended 31.03.88 \$
2. STATE BRANCH REVENUE			
(a) <u>South Australia</u>			
Annual Dinner Receipts		1,415	-
Seminar/Meetings		2,624	-
Wine Sales		13,766	-
Capitation Fees		1,080	-
Interest		230	-
Sponsorship		500	-
		19,615	-
(b) <u>Queensland</u>			
Meetings		788	-
Capitation Fees		1,575	-
Annual Dinner		2,530	-
Interest		274	-
ASEG Ties		334	-
		5,501	-
(c) <u>New South Wales</u>			
Capitation Fees		3,738	-
Functions		1,920	-
Bank Interest		819	-
Video Tape Sales		470	-
		6,947	-
(d) <u>Tasmania</u>			
Capitation Fees		102	-
Interest		6	-
		108	-

AUSTRALIAN SOCIETY OF EXPLORATION GEOPHYSICISTS
(Incorp. in N.S.W. and Limited by Guarantee)

NOTES TO AND FORMING PART OF THE ACCOUNTS
FOR THE NINE MONTHS ENDED 31 DECEMBER 1988

		Nine months ended 31.12.88 \$	Year ended 31.03.88 \$
(e) <u>Western Australia</u>			
Annual Dinner Receipts		1,335	-
Seminar/Meetings		126	-
Capitation /fees		1,036	-
Interest		22	-
Sale of ASEG Ties		150	-
Transfer from Investments		2,000	-
		4,669	-
(f) <u>A.C.T.</u>			
Capitation 1987/88		511	-
Capitation 1988/89		700	-
Bank Interest		27	-
Sale of ASEG Ties		120	-
		1,358	-
(g) <u>Victoria</u>			
Annual Dinner		175	-
Capitation		920	-
Interest		44	-
Donation		95	-
		1,234	-

3. Notes to the previous years financial statements explained the allocation of publishing expenses resulting in a net charge of \$408.00. Substantial delays were experienced in the publication of the A.S.E.G. Bulletin and as a consequence expenditure for undistributed issues were reflected in the previous years account.

AUSTRALIAN SOCIETY OF EXPLORATION GEOPHYSICISTS
(Incorp. in N.S.W. and Limited by Guarantee)

NOTES TO AND FORMING PART OF THE ACCOUNTS
FOR THE NINE MONTHS ENDED 31 DECEMBER 1988

	Nine months ended 31.12.88	Year ended 31.03.88
	\$	\$
4. STATE BRANCH EXPENDITURE		
(a) <u>South Australia</u>		
Annual Dinner	1,375	-
Meetings	4,099	-
Wine Purchases	12,768	-
Awards	50	-
Printing and Stationery	298	-
Bank charges	583	-
	19,173	-
	=====	=====
(b) <u>Queensland</u>		
Meetings	1,545	-
Annual Dinner	2,928	-
Bank Charges	18	-
Printing, Stationery & Stamps	417	-
ASEG Ties	300	-
	5,208	-
	=====	=====
(c) <u>New South Wales</u>		
Functions	4,166	-
Bank Charges	6	-
Miscellaneous	100	-
	4,272	-
	=====	=====
(d) <u>Western Australia</u>		
Annual Dinner	2,100	-
Meetings	700	-
Printing, Postage & Stationery	792	-
Bank Fees	8	-
ASEG Ties	200	-
Purchase of Two Proj. Screens	441	-
	4,241	-
	=====	=====
(e) <u>A.C.T.</u>		
Branch Meetings	159	-
Christmas Dinner	142	-
Postage & Stationery	75	-
ASEG Ties	120	-
Bank Fees	2	-
Golf Prize	7	-
	505	-
	=====	=====

AUSTRALIAN SOCIETY OF EXPLORATION GEOPHYSICISTS
(Incorp. in N.S.W. and Limited by Guarantee)

NOTES TO AND FORMING PART OF THE ACCOUNTS
FOR THE NINE MONTHS ENDED 31 DECEMBER 1988

	Nine months ended 31.12.88	Year ended 31.03.88
	\$	\$
(f) <u>Victoria</u>		
Annual Dinner	171	-
Meetings Kelvin Club	901	-
Membership Kelvin Club 1988/89	420	-
Student Prizes	190	-
Postal Box Hire	66	-
Bank Fees	2	-
R J Hames	500	-
	2,250	-
	=====	=====

5. INCOME TAX
The Company has been granted exemption from income tax by virtue of section 23(g) of the Income Tax Assessment Act 1936.

6. ASSET REVALUATION

	Nine months ended 31.12.88	Year ended 31.03.88
	\$	\$
Opening Balance Asset Revaluation Reserve	-	-
Asset Revaluation Increments - Cash	35,004	-
	35,004	-
	=====	=====
Closing Balance Asset Revaluation Reserve	35,004	-

7. CASH

General Account - Commonwealth	-	806
National Bank - Publications A/C	2,414	-
ANZ Bank A/C	2,325	-
*Grahame Sand Award for Innovation in Geoscience	28,400	26,034
Laric Hawkins Memorial Fund	954	931

AUSTRALIAN SOCIETY OF EXPLORATION GEOPHYSICISTS
(Incorp. in N.S.W. and Limited by Guarantee)

NOTES TO AND FORMING PART OF THE ACCOUNTS
FOR THE NINE MONTHS ENDED 31 DECEMBER 1988

	Nine months ended 31.12.88	Year ended 31.03.88
	\$	\$
BRANCH ACCOUNTS		
<u>South Australia</u>		
Bank A/C	1,561	-
Investment A/C	1,200	-
<u>Queensland</u>		
Bank A/C	1,299	-
Investment A/C	3,000	-
<u>New South Wales</u>		
Cheque A/C	2,847	-
Investment A/C	7,000	-
<u>Tasmania</u>		
Bank A/C	410	-
<u>Western Australia</u>		
Bank A/C	704	-
Investment A/C	8,790	-
<u>A.C.T.</u>		
Bank A/C	1,380	-
Petty Cash on Hand	20	-
<u>Victoria</u>		
Piccol Credit Union	8,670	-
State Bank	1,907	-
	72,881	27,771
	=====	=====

8. RECEIVABLES

Sundry Debtors	47,091	22,000
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9. INVENTORIES

Stock - Satchells for 1989 Conf.	7,000	7,000
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AUSTRALIAN SOCIETY OF EXPLORATION GEOPHYSICISTS
(Incorp. in N.S.W. and Limited by Guarantee)

NOTES TO AND FORMING PART OF THE ACCOUNTS
FOR THE NINE MONTHS ENDED 31 DECEMBER 1988

	Nine months ended 31.12.88	Year ended 31.03.88
	\$	\$
10. OTHER		
Funds on Deposit - Aust Fixed Trust	50,000	77,320
Advances - State Branches		
South Australia	66	66
Victoria	7,000	2,000
	57,066	79,386
	=====	=====

11. PLANT AND EQUIPMENT

Plant and Equipment at Cost	2,197	2,747
Less: Accumulated Depreciation	1,834	1,622
	363	1,125
	=====	=====

12. CURRENT LIABILITIES

Other - Dues Paid in Advance	-	7,000
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13. RESERVES

Asset Revaluation Reserve	35,004	-
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14. MEMORIAL/AWARD FUNDS

Memorial/Award Funds are held in Trust for the respective Beneficiaries and while included in these accounts are not for use by members for normal operations.

AGC MEETING

by Roger Henderson.

(Information from Geoscience News, No. 2/November 1989)

I attended the AGC meeting held on 24 November, 1989 as ASEG's representative.

The journal of the AGC for 1988, Australian Geoscience 1988, has just been published as BMR Report 290.

Murray Basin Conference

A very successful symposium on the Murray River Basin was held in May 1988. A record of the Abstracts from the meeting was issued in BMR, Record 1988/7 (Groundwater 12). The papers will be published in a forthcoming issue of the BMR Journal.

The profit from the Murray Basin '88 Conference will be used as seed money for a new conference to be proposed for late 1990, on Australia's Coastal Zone as a Resource.

Crisis In Science

In conjunction with the Australian Institute of Agricultural Science and the Federation of Australian Scientific and Technological Societies, the AGC held a symposium on "Crisis in Science for Primary Industries: education, training and careers in agriculture and mining."

The symposium was held on 3 May in the National Science and Technology Centre in Canberra and was attended by some 150 people from industry, government and tertiary education. The meeting was addressed by the Hon. Barry Jones and the Hon. John Kerin, followed by representatives of the agricultural, mineral exploration, mining and conservation industries. Speakers representing science teachers and the general scientific research and geoscientific communities also presented papers. At an informal lunch a number of senior public servants with responsibilities in the above areas also attended for discussion.

The meeting was well covered by the press and television. AGC felt that issues relating to all aspects of the problem were well canvassed; the message was pushed home that the government must maintain and indeed increase its support for research and education in disciplines related to the primary industries while it increases its efforts to develop the manufacturing industries.

Coinciding with the symposium, the government issued a document entitled "Research, Innovation and Competitiveness: Policies for reshaping

Australia's Primary Industries and Energy Portfolio Research and Development."

FASTS

The FASTS report was given by the new President, Professor Tony Wicken, Dean of Biological and Behavioural Sciences, UNSW. Tony indicated that as evidence of the high regard for the Australian Geoscience Council, the Maths and Biology Associations of Australia are also contemplating forming similar peak councils. The disciplinary review for maths and science has now been completed and it is believed that agriculture will be next and then possibly computing. It is unlikely that geoscience will be reviewed before 1991. In any case, on present trends, there will be no money left in the budget by this time.

Geoscience Awareness Program (GAP)

This program was initiated by Professor Bob Carter of Townsville, and administered from the Earth Resources Foundation at Sydney University by Robyn Stutchbury. Its aim has been to improve the teaching of earth science in secondary schools and to make the general public more aware of the significance of earth science for the economic and cultural welfare of the country.

Funds for this are drying up and the continued employment of Robyn Stutchbury after February 1990 is not possible unless further funds are obtained. The AGC endorsed its commitment to GAP and will be examining ways to obtain the type of funding required to allow GAP to further its work which is estimated to be of the order of \$150,000 per year. One suggestion is that GAP may join forces with the trustees of the Australian Mining and Geological Museum which has recently been granted \$8 million by the NSW State Government and hopes to raise \$14 million.

Aztec Report

AGC is preparing a response to this report on Australian Science which will be sent to the Prime Minister.

Kakadu

The Government's reversal over the Kakadu mining claim was discussed and a letter has been sent to Senator Cook by Bruce Webb, Chairman of the BMR Advisory Council, deploring the Government's decision and, in particular, expressing grave concern at the Government's apparent failure to accept the scientific advice from its own advisory bodies.

BMR Review

Copies of the AGC submission to the above review have been circulated to all member societies. The response from the Minister dealt with:

- the Mapping Accord which is well under way already
- with the integration of the scientific and economic aspects of BMR with the other policy and economic areas of DPIE and
- with the need to maintain long-term research alongside the shorter-term market-oriented research

The new BMR Advisory Council was endorsed by the Minister as the watchdog to ensure that a balance was achieved. If any members felt that they have a point to make in this or any other respect, comments should be sent to the Secretary of the Advisory Council, BMR.

Environmental Geoscience

It is obvious that there are many strands of endeavour in government, academia and industry which operate independently in various fields of environmental geoscience. In some instances geoscientists are being ignored by managers and other scientists because their contributions are not seen as relevant to the solution of immediate problems.

A recent survey by GAP of first year undergraduates in geology showed that the importance of the subject for environmental studies was not appreciated even by those who had chosen to study the subject and were already well advanced in the first year of the course. Some members of the AGC Executive have been giving thought to a workshop at which interested parties could examine proposals for strengthening interest and studies in environmental geoscience. If ASEG members have any suggestions about how they might proceed, please contact Ken Campbell, Geology Department, ANU (GPO Box 4, Canberra, ACT 2601).

I was impressed by the vast number of issues with which the AGC is concerned and all of which are of interest to ASEG, including such things as education, research and community awareness of geoscience.

INAUGURAL JAEGER MEDAL FOR EARTH SCIENCE

It is with pleasure that the Australian Academy of Science announces the inauguration of the Jaeger Medal. This award will recognise the outstanding contribution to Australian earth science (and to the Academy) by the late John Conrad Jaeger FAA, FRS, Professor of Geophysics, Research School of Physical Sciences, of the Australian National University, until his death in 1979.

The award will be made to a scientist for investigations into the solid earth or its oceans, carried out in Australia or having some connection with Australian earth science.

The award will be made biennially. The inaugural medal will be presented at the April 1990 Annual General Meeting of the Academy.

Nomination of candidates for the Medal is hereby invited. Proposals should be covered by the nomination form available from the Academy's secretariat and include a curriculum vitae and sufficient details of the candidate's scientific work and its impact to enable the Academy to assess it in the light of the criteria for the award of the Medal. Proposers should ask at least two referees to forward comments directly to the Academy to arrive by the closing date for nominations.

Nominations are confidential and should be addressed to:

The Executive Secretary
Australian Academy of Science
GPO Box 783
CANBERRA ACT 2601
Tel: (062) 47 5777 Mrs Faye Nicholas

The closing date for nominations is Monday 29 January 1990

7th ASEG CONFERENCE AND EXHIBITION

"Prediction with Precision"

MELBOURNE



L-R: Max Richards (Aberfoyle), Ian Johnson (CRAE), Tom Eadie (Aberfoyle), Peter Grant (BHP), Greg Street, and Representative (Melbourne Tourist Authority)



L-R: David Tucker, Greg Steemson (Metana), Brian Embleton (CSIRO)



Greg Street, President, ASEG Federal Executive



Demonstrating Digicon's interactive velocity analysis software on Sun workstation.

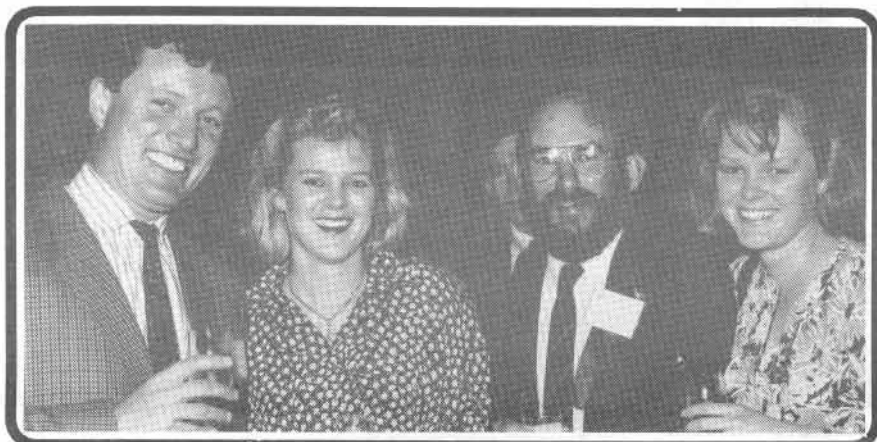
Sitting L-R: Elwyn Jones, Nigel Fisher, Sami Khan, Bimal Banerjee, Gareth Williams

Standing L-R: John Moore, Ted Jacobson, Malcolm Hobson

7th ASEG CONFERENCE AND EXHIBITION

"Prediction with Precision"

MELBOURNE



L-R: Finian O'Sullivan (Geosystems), Jill Davies (Peat Marwick Hungerford), Greg Street (Mackie Martin) and Robin Scott (BHP)

L-R: Amanda Culver (Cultus), Gareth Williams (Digicon), Judith Pritchard (Cultus) and Elwyn Jones (Digicon).



L-R: Derecke Palmer (NSW Mines Dpt), Greg Poole (BHP Collieries), Barry Long (Velseis), Bridget Taylor (Interpix) and Charles Stoyer (Interpix).



Standing L-R: Nigel Hungerford (Billiton), Des Rainsford (FinNeth Canada), Jenny Allison, Eric Allison (Shell), Tom Eadie (Aberfoyle), Frank Arnott (Stockdale)

Kneeling L-R: Alan Whittaker and Peter Milligan (BMR), Ellen Eadie, and Don Pridmore (Aerodata)

CORPORATE MEMBERS

In this and following editions of *Preview*, we will be giving profiles of our corporate members. These profiles will be printed in the order that they were received by the secretariat and we hope that they will be of interest to readers.

WOODSIDE OFFSHORE PETROLEUM PTY LTD



Woodside is the Operator of the \$12 billion North West Shelf Natural Gas Project - Australia's biggest and most expensive energy resource development.

The project is based on vast hydrocarbon reserves - principally natural gas, but with significant condensate reserves - discovered in the early 1970's on the North West Continental Shelf, offshore from Dampier.

Between 1980 and 1984, some \$2.2 billion was outlaid to bring on stream the domestic gas phase of the project, which is now established and supplying gas to the State Energy Commission of Western Australia.

More than half of Western Australia's non-transport energy requirements are now services from the project, involving more than 200,000 households and more than 95 per cent of industry that has the capacity to use natural gas.

In 1985, the North West Shelf joint venture participants announced the go-ahead of the \$9.8 billion liquefied natural gas (LNG) phase of the project. Construction began immediately, and in June 1989 the vast new LNG complex on the Burrup Peninsula produced its first liquefied Natural Gas.

The first shipment of Australian LNG left the Burrup on July 28th, 1989, aboard the carrier Northwest Sanderling on August 8th, heralding the birth of a new Australian export industry.

At peak, the North West Shelf Project will deliver six million tonnes of LNG annually to eight Japanese electricity and gas utilities. Between them, these eight utilities serve the power requirements of 90 million Japanese people and a big proportion of Japan's major industries.

The major components of the domestic gas phase included the construction of the North Rankin A offshore gas production platform, situated in deep water 135 kilometres off the coast from Dampier.

A subsea pipeline carries the gas ashore to the domestic gas treatment plant, from which the State

Energy Commission's 1500-kilometre onshore pipeline takes treated gas to the populated south-west of Western Australia.

The current LNG phase involves the construction of two LNG processing trains and ancillary facilities, four LNG storage tanks and an 800-metre long LNG/condensate loading jetty. A fleet of seven LNG carriers is also being built to carry the product from the Burrup Peninsula to terminals in Japan.

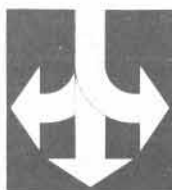
Scheduled for the future on the Burrup Peninsula is a third LNG processing train. Offshore, there are plans, subject to a final decision to go ahead, for a second production platform - Goodwyn A - to be scheduled some 20 kilometres from North Rankin A.

As operator for a number of consortiums Woodside is actively exploring several permits on the NW Shelf. Woodside operates Permits WA-1-P and WA-28-P in the Dampier Sub-basin and last year completed a 2km seismic grid cover of modern seismic over these permits; successful exploration wells Echo No. 1 and Wanaea No. 1 were drilled in Permit WA-28-P. In the Browse Basin Woodside operate Permits WA-33-P and EP-36 which contain the large Scott Reef and Brecknock gas fields which are yet to be developed. In the Bonaparte Basin renewal applications for Permits WA-36-P, NT/P8, /P11 and /P12 are awaiting resolution of the boundary dispute between Indonesia and Australia.

Seismic investigations continue to be carried out over the Angel, North Rankin and Goodwyn Fields. Woodside was the first company to record a 3D seismic survey in Australia with the North Rankin 3D survey. A paper was presented at the ASEG Conference of 1988 describing the extremely valuable information provided by the Goodwyn 3D seismic survey on the extent of hydrocarbon accumulation and on the reservoir delineation.

Woodside Offshore Petroleum, a wholly-owned subsidiary of Woodside Petroleum, is based in Perth, Western Australia. Its head office is located at 1 Adelaide Terrace, Perth (Ph: (09) 224 4111; telex: AA92326; facsimile: 325 8178). The company's Karratha phone number is: 091/85-2466).

GEOTERREX PTY LTD



Geoterrex Pty Ltd is a contracting and consulting company that provides geophysical services to the exploration industry. Geoterrex was founded in 1966 and commenced operations in Australia in 1972. Presently, the Geoterrex office in Sydney operates in conjunction with offices in Canada and France to conduct geophysical surveys on a worldwide basis.

Since its inception, Geoterrex has specialised in airborne and ground geophysics using all methods applied to data acquisition, processing and interpretation. The organizational structure of Geoterrex Pty Ltd is such that the company is divided into three major divisions: airborne geophysics, ground geophysics, and data processing and interpretation.

Geoterrex presently operates three fixed wing aircraft for airborne geophysical data acquisition. Two Aerocommander 500S aircraft are used for airborne magnetic and radiometric surveys and when necessary equipment is installed into helicopters for surveying over particularly rugged areas. The cesium vapour magnetometers employed on these airborne magnetic surveys can take measurements up to ten times per second which corresponds to a reading interval of approximately seven metres for surveys flown with the Aerocommander aircraft. These aircraft also carry 33.5 litres of gamma ray spectrometer crystal so that high quality radiometric data can be acquired simultaneously.

Geoterrex commenced operating its CASA aircraft in Australia in 1989. This somewhat larger aircraft will be the platform for the GEOTEM airborne electromagnetic system. GEOTEM is a digital time-domain EM system that incorporates significant improvements over the INPUT technique previously offered by Geoterrex. This new system is capable of significantly increased depth penetration and greater anomaly resolution. This has been achieved by increasing transmitted signal and by very rapid sampling of the received signal which is made possible by the digital technology incorporated into the design of the EM receiver. In addition to the EM data, the aircraft also carries a cesium vapour magnetometer so that airborne magnetic data can be acquired to supplement any GEOTEM survey.

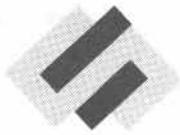
All of the airborne geophysical methods have benefited considerably from the recent advances in navigation technology. Ultra high frequency radio navigation systems such as Syledis, satellite

positioning information (GPS) and Doppler navigation methods can be used to provide very accurate data necessary for flight path determination. Accordingly, very detailed airborne surveys are now possible (50 metre line spacing surveys have already been flown) and airborne surveys can also rely on these sophisticated navigation methods when visual navigation is not possible. Recent surveys employing these techniques include Doppler navigated fixed wing airborne magnetics in the highlands of Papua New Guinea and helicopter borne magnetic coverage of areas in Malaysia using Syledis electronic navigation.

Geoterrex continues to operate a comprehensive range of ground geophysical methods on behalf of exploration and engineering companies. The techniques employed include induced polarisation, resistivity, both time and frequency domain electromagnetics, gravity and magnetics. Geoterrex has designed its own data logging systems using Hewlett-Packard microcomputers. For IP and TEM applications, the computer is used in the field to log the data collected by the instrument. For magnetic and gravity surveys these computers are used at the end of each field day to monitor data quality, perform data reductions and to create a computer record of the data collected. One recent and significant innovation in ground geophysical methods is the use of inertial navigation systems for the positioning of stations on large scale regional gravity surveys. This method enables high accuracy gravity coverage of large areas and can be helicopter supported to survey in areas where direct land access is difficult.

Data processing is carried out on the Concurrent super mini computer recently installed at the Geoterrex office in Sydney. This facility is both hardware and software compatible with the computer centres already established in Canada and France. Interpretation and data processing software has been written 'in house' by geophysicists and programmers for use on the mainframe computer. Additional software has also been generated for data reduction and verification purposes in the field on smaller computers. During recent years, Research and Development efforts have represented about 5% of the total revenue of Geoterrex. Some of the main efforts in R and D projects have been in time domain electromagnetic data acquisition and processing as well as developing integrated airborne navigation systems.

Geoterrex Pty Ltd in Australia currently has a staff of approximately thirty people, thirteen of whom are geophysicists. Geoterrex Pty Ltd has been a corporate member of the ASEG since 1983 and many of the professional staff are also individual members.



BHP-Petroleum, a wholly owned subsidiary of the Broken Hill Proprietary Company Limited (BHP), is Australia's international oil company, with interests in some 24 countries. The company's activities involve petroleum exploration, production, refining and marketing. BHP Petroleum has more than 2000 directly employed personnel, two thirds of whom are based outside Australia. These include 55 geophysicists, more than half of whom are located in Melbourne. BHP Petroleum regularly recruits new graduates for the Melbourne office, accepting applicants from all Australian and NZ universities.

On the basis of its proven reserves of oil and gas, BHP Petroleum ranks 12th among the world's listed oil companies. Crude oil production in the 1988-89 financial year was 210 000 barrels per day while production of natural gas averaged 548 million cubic feet per day.

The company's upstream exploration and production activities are grouped geographically into 3 divisions - Australia/Asia (Melbourne), Americas (Houston), and Europe/Africa/Middle East (London). Downstream activities are managed by the company's wholly owned subsidiary, Pacific Resources Inc (PRI), based in Hawaii.

BHP Petroleum's major projects and assets are:

Australia/Asia:

50% participation in the Gippsland Basin oil and gas fields. Since their first survey in 1962 BHP Petroleum has been, mostly with Esso as operator, at the forefront of developments in petroleum geophysics including some of the first digital recording in Australia and the recognition of velocity variations as a critical factor. Further exploration and development of the Gippsland Basin continues.

A major share in the \$12 billion North West Shelf Project.

50% interest and operator of the Jabiru and Challis fields in the Timor Sea, off Australia's northern coast.

BHP Petroleum also has extensive exploration programmes in other areas of the Timor Sea, the Arafura Sea and off the Western Australian coast. These areas have been the focus of a major geophysical effort over the last six years, with a programme each year of several thousand kilometres of both 2D and 3D seismic data, plus gravity and

magnetic surveys. In addition to new work, extensive reprocessing of old data has been carried out.

In Asia and the Western Pacific, the company has exploration activities in Papua New Guinea, Indonesia and India. In India a major seismic survey has just been completed, operated by BHP Petroleum from its Singapore office.

The Americas:

BHP Petroleum (Americas), from its head office in Houston, explores and operates in 21 states of the United States, 2 provinces in Canada, and is conducting exploration programmes in Argentina. Particularly in the offshore Gulf Coast, the division is geophysically active, with a programme including large 3D surveys.

The division produces oil and gas from nineteen platform facilities, six of which are operated by the company.

Europe/Africa/Middle East:

The company has acquired exploration permits covering large areas offshore Tunisia, in the Western Desert of Egypt, in Congo, the Middle East and Algeria, and is currently carrying out geological and geophysical surveys of its blocks in order to define drilling prospects.

A good example of the Division's activities is its involvement in Algeria. On 24 June 1989, BHP Petroleum and SONATRACH - the Algerian State Oil Company - signed a Protocol and Production Sharing Contract. This is the first contract granted to a foreign oil company since the change in petroleum legislation in Algeria in 1986.

The contract permits BHP Petroleum as the operator, to begin exploration in two blocks covering an area of about 7 300 square kilometres, some 900 km south of Algiers. This programme, with reprocessing of data already in train, will involve a major seismic effort in difficult terrain.

Pacific Resources Inc.:

The friendly takeover of PRI in May 1989 was a significant step in BHP Petroleum's strategy for further expansion into the refining, marketing, retailing and petroleum trading businesses.

Hamilton Oil Corporation:

Through its 50.7% interest in Hamilton Oil, BHP Petroleum has a major interest in four North Sea oil and gas fields, as well as access to 221 million barrels of oil equivalent reserves, mostly in the North Sea.

Hamilton's production for 1988 averaged 5 308 barrels of oil and 130 million cubic feet of gas per day.

Geophysics:

Partly as a result of its largely offshore orientation, BHP Petroleum has always been a geophysically oriented company. One example is the use of seismic interpretation workstations. In 1983 BHP Petroleum became the first oil company in Australia and one of the first anywhere to have a commercial interpretation workstation and, today, with three, has more than any other Australian company. There are also four workstations in Houston and one workstation with Hamilton.



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REPORT OF THE GEOPHYSICAL ACTIVITIES COMMITTEE

*By Roger Henderson
Chairman*

The Past 7 Years of Seismic Activity

The accompanying graph shows the total line kms of seismic surveying in Australia, from 1982 to 1988 and also the split between onshore and offshore.

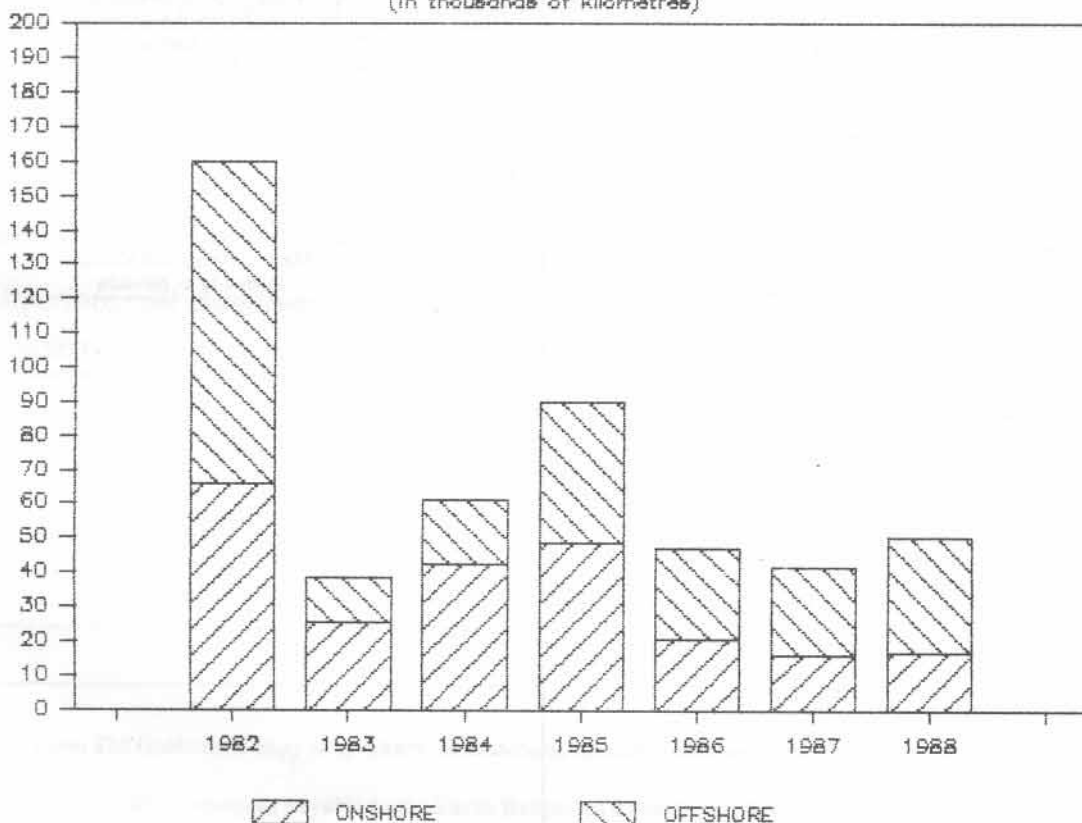
Activity dropped markedly after the fall in oil prices in 1982, to a level which, in the last three years, has not exceeded 50,000 line kms. For the past four years offshore kms have exceeded onshore. This would appear to be a growing trend as for 1989 to mid-September by far the greater proportion (85%) of kms was offshore.

The amount of activity would appear to be on the increase in 1989 as the total to mid-September equals the total for all of 1988.

Onshore activity has fallen markedly from previous years, however, and offshore activity has increased.

AUSTRALIAN SEISMIC ACTIVITY

(in thousands of kilometres)



MEMBERSHIP

New Members

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

MEMBER	CATEGORY	STATE/COUNTRY
Bisset Andrew	Student	QLD
Chua Chew Kian	Active	MALAYSIA
Erkhov Venedikt	Associate	USSR
Lotyshev Vassiliy	Associate	USSR
Shamal Anatolii	Associate	USSR
Tod Andrew	Active	QLD

Unknown Addresses

We do not have the correct addresses for a few members, does anyone know the whereabouts of:-

Dr Sampath

last known address: BMR
GPO Box 378
Canberra ACT 2601

Changes to State Branches

Jenny BAUER formerly QLD branch now WA Branch

Her new address is:
Lasmo Oil (Australia) Limited
PO Box 1135
West Perth WA 6005

Kevin FLEMING formerly WA branch now NSW Branch

His new address is:
Geoterrex
13 Whiting Street
Artarmon NSW 2064

Stephen GREAVES new address is:
Petrocorp NZ
PO Box 1818
Wellington NEW ZEALAND

UNIVERSITY OF NEVADA-RENO
Department of Geological Sciences
Mackay School of Mines
University of Nevada, Reno

THE ARTHUR A. BRANT CHAIR IN GEOPHYSICS

The Department of Geological Sciences invites applications and nominations for the Arthur A. Brant Chair in Geophysics. This endowed Chair, privately funded by individuals and mining concerns, will provide a position for an internationally recognised geophysicist. Applicants must have appropriate academic qualifications, scholarly distinction and international prominence. The successful applicant will be expected to teach, conduct and oversee vigorous research programs, publish in refereed journals and foster mutually beneficial industrial relationships. Applications are encouraged from outstanding candidates specialising in any aspect of solid earth geophysics, including the development of fundamental principles and methodology and the application of geophysics to the exploration and development of resources.

The Department of Geological Sciences offers degrees in Geology, Geophysics and Geological Engineering at the B.S. level and all of these plus Hydrogeology at the M.S. and Ph.D levels. Current enrolment is about 200 undergraduate and graduate students. A close research relationship exists between the Department and the Nevada Seismological Laboratory, the Centre for Neotectonic Studies, and the Nevada Bureau of Mines and Geology, all within the Mackay School of Mines.

The search committee will begin its review in the Fall of 1989, and continue to accept and review applications and nominations until the position is filled. Consideration will require a current resume, a nomination or application letter indicating appropriate interest, and the names, addresses and telephone numbers of three references.

Applications and nominations should be sent to:
Professor Joseph Lintz, Jr
Chairman, A.A. Brant Chair Search Committee
Mackay School of Mines
University of Nevada
Reno, Nevada 89557-0047

The University of Nevada, Reno is an AA/EOE and employs only United States citizens and legally authorised aliens.