PREVIEW

AUSTRALIAN SOCIETY OF EXPLORATION GEOPHYSICISTS

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Introduction

The "Mother of All Surveys", the world's largest geophysical survey ever (in terms of data volume), is being carried out now on the Northwest shelf by an Australian Company: Woodside. Principal Geophysicist of Woodside, Peter Vaughan reports on East Dampier 3D marine seismic survey's mind numbing statistics in our feature article (p 17).

A large part of this issue (pp 2 - 8) is devoted to informing members about the changes to the BMR (now the AGSO). December Preview will look at the current program of the AGSO with an emphasis on geophysics.

Dave Pratt reports optimistically on the ASEG-GDF and GXF standards this issue.

Improved Technologies Revised Solutions

5 - 8 October 1992

Hotel Conrad and Jupiters Casino Gold Coast Queensland Australia

ASEG 9th Geophysical Conference and Exhibition

Final news of the October Conference is necessary reading (p 19 - 20). On behalf of the ASEG members and Executive I wish the Queensland Conference Committee a successful conference and we hope to see many members at the Gold Coast, renewing and making new friendships with ASEG colleagues.

Editor

★★★★★★★★

Coming Issues - New Deadlines

Copy Deadline	Publication
October 16	October, 1992
December 11	December, 1992
February 19	February, 1993
April 16	April, 1993

BMR → AGS → ?

The BMR is now the AGSO (Australian Geological Survey Organisation) or AGS for short. Since the last issue of PREVIEW rapid changes have occured. As a service to ASEG members, this issue of PREVIEW looks at what has happened, what is proposed, what has been the ASEG's response so far and gives some background information to help ASEG members to formulate informed views.

In our special AGS feature this issue we publish the following:

(1) ASEG President's letter - an open letter to the Prime Minister calling for industry consultation. Apparently this and other representations were successful in getting the Government not to rush through changes to BMR.

(2) Government Press Release - outlining immediate changes and a process for further change for the new AGS. The Government is announcing a review to which presumably the ASEG and its members can make submissions.

(3) Extracts from the Woods Review - the most recent review in BMR that has focussed the old BMR into mapping activities. These put the current role of the AGS in perspective.

Australia has been fortunate in having the BMR. The regional framework for exploration that BMR has provided and the accumulated experience and knowledge of Australian Geology, is an ongoing geoscience resource of immense value. The table opposite from an AMIC submission on BMR highlights several discoveries attributable in some way to BMR activities.

TABLE - MINERAL DISCOVERIES

List of some mineral discoveries made directly by BMR

- Peko mine, NT - copper-gold mine
- Woodcutters, NT - lead-zinc-sliver mine
- South Alligator uranium field, NT - several small mines
- Mt Bundey, NT - iron ore mine

List of some mineral discoveries made with the help of BMR background data

- Warrego, NT - copper-gold-bismuth mine
- Olympic Dam, SA - world ranking copper-uranium-gold-rare earth mine
- Groote Eylandt, NT - world ranking manganese mine
- Kambalda area, WA - several nickel mines
- NW Queensland phosphate province - Duchess mine and other deposits
- Greenvale, Qld - nickel-cobalt mine
- East Alligator uranium field - Ranger mine and other world ranking deposits
- Thalanga, Qld - copper-lead-zinc-silver mine
- Yeelirrie, WA uranium deposit

(Source: Review of the Bureau of Mineral Resources, Geology and Geophysics - a report to the Minister for Resources by Mr. A.S. Woods, 10, December 1988. Australian Government Publishing Service, Page 83. Commonwealth of Australia Copyright. Reproduced with Permission).

In order for the AGS to continue to serve Australia's interest, it is important that members of the industry seek to influence the important changes to the AGS signalled in the current review and that a timely, informed debate on the issues occurs. For ASEG members, PREVIEW is an appropriate forum. The ASEG executive needs to hear your views. Please write (Note the deadline for next PREVIEW is October 15).

The December issue of PREVIEW will be devoted to the current AGS program with emphasis on the National Geoscience Mapping Accord (NGMA) program and geophysical aspects.

Members need to realise also that the ASEG has a nominated representative to advise the BMR. John Denham of BHPP has just assumed this role which was previously ably filled by Bob Smith of CRAE.

Editor

President's Letter

29 July 1992
The Honourable Paul Keating
Prime Minister
Suite 8.M.G.
Parliament House
CANBERRA ACT 2600

Dear Prime Minister,

Re: The Restructuring of The Bureau of Mineral Resources

It was with dismay and disappointment that we learnt, by way of a leaked document, of the proposed re-structuring of the Bureau of Mineral Resources. If it had not been reported in the Australian Financial Review (17th July 1992), it would appear that neither the mineral, petroleum nor the coal industries were to be made aware of the changes until after they had been irretrievably put in place. We find it incredible that such changes should even be considered without consultation with representatives of these industries, particularly when Australia earns in excess of 40% of its wealth from mining and related industries.

The BMR is the repository of the basic geological and geophysical information required and used by all in the Earth Science professions. Data provided by the BMR is the first step of every exploration program, and it is continually used throughout the exploration program.

But this does not imply that the BMR is purely a data storage facility. Australia is a large country and our knowledge of the geology, the structure, and the mineral deposits, is in its infancy. To date the geophysical coverage has been of a reconnaissance nature only, but this has been sufficient to find valuable deposits such as Olympic Dam at Roxby Downs in South Australia and many others. The BMR have been actively involved in the collection of geophysical data over the years, and should continue to be the coordinators even if the data is collected by the State Surveys or private contractors. The following examples are given as an indication of the important role played by the BMR and the need for them to continue in this role.

: The airborne magnetic coverage of Australia is based on flight lines spaced at 1500m and still the whole of the country is not covered; the desired coverage is at least 500m for a reasonable representation of the total magnetic intensity.

: The airborne radiometric coverage is only fractional with more than two thirds of the country still to be covered to an acceptable standard.

: The gravity coverage is based on a distribution of stations at a density of one reading per 150 square kilometres. The station density in Europe is one reading per 2.5 square kilometres.

: The airborne electromagnetic coverage in Australia is still to commence; similar surveys in Finland, for instance, are complete.

: Seismic surveys, so essential to provide us with the information with which we can start to understand the structure of the Australian continent, both onshore and offshore, and to assist with the location of new petroleum reserves, are still only of a sporadic nature.

These types of surveys are essential if we are to maintain the balance in the mining and petroleum industries; new deposits must be found. Exploration depends heavily on the existing information and is continually in need of more detailed information.

The BMR is an organisation in Australia which has the experience, resources, and ability to maintain and expand this essential Australia-wide data base. Fragmentation of the Bureau, into the CSIRO, which is primarily a strategic research organisation, could have a negative effect which will reflect adversely on the viability of the Australian mineral industry.

How can change be considered without consulting those who will be so profoundly affected by such changes?

We call on you to halt the process of restructuring the BMR, until the views of industry and others who will be affected can be made public. The changes you are proposing are too important to the future well being of Australia to be made in haste.

Yours Faithfully,

Hugh Rutter

HUGH RUTTER
FEDERAL PRESIDENT, ASEG

BMR's Future?

Joint Statement - New Arrangements for Bureau of Mineral Resources

Press Release - 13 August 1992

The Federal Minister for Primary Industries and Energy, Mr Simon Crean and the Minister for Resources, Mr Alan Griffiths, today announced a number of changes to the operational and administrative arrangements for the Bureau of Mineral Resources (BMR).

The Ministers said that in the broad context of resource and environmental management for sustainable development, the Government was anxious to ensure that scientific support for resource decisions was provided in the most efficient way.

BMR has long been a central element in providing that support, as well as providing the knowledge base necessary for the continued development of our exploration industries.

However, in recent years BMR, like national geological survey organisations world wide, has been asked to do much more to help address national and global issues, notably in relation to land management and protection of the environment. CSIRO has also been developing its research in these fields.

Preliminary consideration has therefore been given to closer integration of the strategic research and national mapping activities of BMR and those of CSIRO in order to improve the efficiency of the national research effort and integration of data mechanisms for coordinating scientific and economic resource information in providing advice to the Government on resource assessment issues.

As a result of these considerations we are announcing a number of measures, as follows:

1. An inquiry into the administrative arrangements under which the BMR operates, including whether it should be established as a separate Institute within CSIRO or remain within the Department of Primary Industries and Energy (DPIE)

- the inquiry will be chaired by Dr Max Richards, an Executive Member of Australian Mining Industry Council (AMIC) and Board Member of the CSIRO.

- terms of reference of the inquiry are as follows.

Terms of Reference

The Government recognises that the national geological survey organisation is an important strategic asset as we approach the 21st century.

It therefore recognises the need to maintain an integrated and coherent national geological survey organisation with a clear identity.

Any new arrangements resulting from the Review would build on the largely successful implementation of the recommendations of the 1988 Woods Review and will ensure that the resources of the Australian Geological Survey Organisation (AGSO) will remain focussed on geoscientific mapping and database development into the longer term.

The Terms of Reference of the Review (T.O.R.) are:

(i) To examine and report on the appropriate composition and structure of the Australian Geological Survey Organisation and its relationship to CSIRO research activities, and to the activities of State Geological Survey organisations.

(ii) On the basis of the response to T.O.R. (i), to advise on the administrative arrangements and geographic location of the geological survey organisation, including whether it should be established as a separate Institute within CSIRO, remain within DPIE, or some other arrangement.

(iii) To examine and report on the mechanisms for coordinating geoscientific and resource information from AGSO and CSIRO in providing advice to client departments.

(iv) To advise on the most appropriate funding arrangements for AGSO, taking into account the June 1992 report of the Joint Committee of Public Accounts.

(v) To examine arrangements for reporting and accountability to Government to ensure the continuing relevance and high quality of AGSO activities.

The review will be conducted by a four person team chaired by Dr Max Richards and including Mr Gerry Gleeson, the current Chairman of the BMR Advisory Council. Other members will include

- another senior business executive with a resources related background
- the Chief Scientist or his nominee.

The review team will consult widely and report to the Government within 12 months. The report will be made public.

2. The resources currently allocated to petroleum and minerals resource assessment within BMR will be merged with the current Bureau of Rural Resources (BRR) in DPIE to become the Australian Bureau of Agriculture and Resource Sciences (ABARS). ABARS will operate as a professionally independent Bureau within DPIE. ABARS will include the National Resource Information Centre (NRIC), which is currently operated jointly by BMR and BRR.

3. A change of name of BMR to the Australian Geological Survey Organisation (AGSO) consistent with its contemporary role.

4. Within DPIE, an explicit management system will be put in place to properly link the AGSO scientific mapping activities with the resource assessment responsibilities of ABARS.

ABARS and the Australian Bureau of Agriculture and Resource Economics (ABARE) will provide a full range of scientific and economic resource information to directly service the Ministers for Primary Industries and Energy and Resources.

The Ministers said the Government would respond fully to the Report of the Review Committee, including consideration of the capital requirements for housing the Australian Geological Survey Organisation, as well as any costs associated with changed administrative or staffing arrangements.

The Australian Geological Survey Organisation will remain in its current accommodation until the review is completed. In the interim, the Government will commit up to $5m to address accommodation issues, including immediate safety concerns in the current BMR building.

The Government is confident that the measures we have announced today will improve both the short and long term performance of Australia's national geoscience effort.

For further information: Kristen Barry, Minister's Office, Ph: (06) 277 7480

Woods Review Of BMR - Extracts

1. Historical Role of BMR

The Bureau of Mineral Resources, Geology and Geophysics (BMR) was established in 1946, incorporating the then existing Mineral Resources Survey. It was realised at the time that effective exploration required a sound knowledge base, then almost completely lacking, of both surface and subsurface regional geology; consequently, systematic regional geological and geophysical surveys at a scale of 1:250,000 formed a major part of BMR's activities from the early 1950's onwards.

Reconnaissance geological coverage of Australia was achieved by the late 1970's through the combined efforts of the State/NT Geological Surveys and BMR; of this approximately 50% resulted from BMR or joint operations (mainly in Western Australia, Queensland and Northern Territory). From the late 1960's onwards, BMR began undertaking more detailed, multidisciplinary, regional studies to provide the increasingly sophisticated geoscience information required for exploration and resource development.

Regional geophysical surveys have always been primarily a BMR responsibility. A number of programs have been completed with the major outstanding onshore program, reconnaissance airborne magnetic coverage, being due for completion in the early 1990's. Since the 1970's the emphasis of the regional geophysical program has focussed increasingly on offshore areas.

BMR's contributions to the discovery of petroleum and mineral resources in the past are widely recognised by industry. BMR's involvement in these discoveries has been previously documented (for example see House of Representatives Hansard 16 February 1982, pp 175-178); the Australian Mining Industry Council (AMIC) in its submission also acknowledges BMR's contribution and lists various examples (see previous table, Page 1 - Ed)

2. ASTEC Review

In May 1978, the Australian Science and Technology Coucil (ASTEC) was asked by the then Prime Minister to provide advice on the future role of BMR. ASTEC's report was tabled in Parliament on 20 November 1978 (ASTEC 1978) and addressed both the role and organisation of BMR. ASTEC's recommendations were substantially accepted by the Government of the day which agreed that:

- The future role of BMR should be:

(i) to develop an integrated, comprehensive, scientific understanding of the geology of the Australian continent, the Australian offshore area and the Australian Antarctic Territory, as a basis for minerals exploration; this is to be done where appropriate in co-operation with State Geological Surveys and other relevant organisations and having regard to priorities for the search for minerals approved by the responsible Minister;

(ii) to be the primary national source of geoscience data and to publish and provide information; and

(iii) to undertake mineral resource assessments in accordance with programs and priorities approved by the responsible Minsiter with the advice of the BMR.

- After consultation with the States and NT, BMR relinquish responsibility for the completion and revision of the 1:250,000 scale geological map series, as soon as convenient.
- BMR be recognised as a geoscientific organisation with a substantial capacity to undertake strategic mission-oriented research.
- BMR should have a career structure appropriate to its strategic mission-oriented research role.
- A committee be established to advise BMR in the formulation of its research and assessment programs.

The ASTEC recommendation that BMR be reorganised as a statutory authority was not accepted on the basis that the upgraded role for BMR could be achieved within a departmental structure.

3. Post - ASTEC Changes

Implementation of the new charter arising from acceptance of the ASTEC recommendations resulted in major organisational, staffing and program changes, including:

- reorganisation into four research divisions, a resource assessment division and two corporate branches;
- upgrading of the position of Director;
- introduction of research scientist classification with merit assessment;
- relinquishment of responsibility to the States/NT for 1:250,000 scale geological mapping and greatly reduced 1:100,000 scale geological mapping (as a result of changed emphasis in the province studies program); and
- a significant shift of resources into petroleum related research (including a substantial marine effort) in response to Government direction and a consequent reduction in effort in the minerals sector.

4. Summary of Recommendations of Woods Review (December, 1988)

Recommendation 1

BMR's future role and function be defined as follows:

Role

- To improve the effectiveness of exploration for, and assessment of, Australia's petroleum, mineral and groundwater resources, and to contribute to land use planning and the mitigation of natural hazards, through the development of publicly available databases providing a comprehensive, integrated geoscientific understanding of the Australian continent, the Australian offshore area and the Australian Antarctic Territory.
- To facilitate the formulation and implementation of policies necessary for the effective management of petroleum and mineral resources by the timely provision of scientific and technical assessments, advice and information to Commonwealth Government, industry and the public.
- To contribute towards Australia's international policy objectives through provision of special national geoscientific capabilities and through participation in appropriate international multilateral and bilateral geoscientific programs.

Functions

BMR's functions as the principal Commonwealth Government geoscience agency, analogous to other national geological surveys, should be to:

1. carry out integrated regional geophysical, geological, geochemical, hydrogeological and tectonic surveys and research into, and syntheses of, the onshore basins, mineral provinces and the regolith of continental Australia, as a basis for exploration by the mineral and petroleum industries. Geoscientific maps and data sets, supported where appropriate by published reports, should be regarded as the most important products of the geoscientific research and related studies undertaken by BMR;

2. similarly, carry out major integrated offshore studiesof the Australian continental margins and other strategic offshore areas;

3. assess the petroleum and mineral resource potential of Australia and its territories, its relevance to the total inventory of earth resources and to Australia's competitiveness in each commodity area and carry out scientific and technical research into Australia's geoscience potential to meet future world mineral and energy commodity requirements;

4. help establish and co-ordinate the national geoscientific database required for the consideration of land use issues;

5. be the national repository of data concerning the petroleum, mineral and groundwater resources of Australia and its territories and, as the national geoscience survey organisation, be a major focus for both national and international geoscience from an Australian perspective;

6. maintain geophysical observations in Australia and Antarctica to monitor seismic, geomagnetic and other natural geophysical phenomena and to respond to specific Commonwealth Government requirements such as nuclear monitoring;

7. provide a national scientific capability in selected specialist areas, as required to support broad-ranging multidisciplinary research

programs and collaboration with research personnel from other institutions (e.g. Commonwealth and State/NT agencies, resource companies and universities);

8. in all the above, co-operate and, where appropriate, collaborate with State/NT Government agencies, the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and other geoscience organisations.

Recommendation 2

As a matter or priority BMR and the State/NT Geological Surveys, through the Chief Government Geologists' Conference, and in consultation with industry and the academic community, develop a national geoscience mapping strategy (National Geoscience Mapping Accord) setting out

- an assessment of current and future national needs;
- priorities;
- goals, objectives and long range plans;
- mechanisms and procedures for monitoring and reviewing the status of maps, map coverage and mapping programs;
- the need for, and means of introducing new technology (ensuring maintenance of standards and compatibility of systems); and
- the resources currently available for this program, and those required to achieve desirable levels of activity.

Recommendation 3

(a) Where appropriate, consideration be given to funding State /NT Government Departments to provide additional staff specifically to facilitate the extraction of geoscientific resource information from State/NT records and its provision to the national science database.

(b) Staff exchanges with State/NT Geological Surveys, and the outposting of some BMR staff to Survey Headquarters and regional offices during joint projects be encouraged.

Recommendation 4

Liaison arrangements in addition to those already in place between BMR and CSIRO, be established on a Divisional basis to co-ordinate research programs and to identify areas of collaboration and co-operation.

Recommendation 5

BMR's Antarctic program be reviewed by the Advisory Council in the light of the revised charter; extension of BMR's geoscience activities to meet specific DASETT objectives be funded by DASETT on a contract basis.

Recommendation 6

BMR continue to co-operate closely with universities through joint and collaborative research where this contributes to BMR's program, and wherever possible BMR utilise specialist expertise and facilities available in universities.

Recommendation 7

BMR program and priorities should better reflect the needs of industry by:

- placing greater emphasis on geoscience mapping and related research, in collaboration with the State/NT Geological Surveys and other geoscience organisations, and developing and maintaining a range of national geoscience databases;
- using the national geoscience knowledge base to provide regional syntheses, analyses and interpretations;
- applying the latest technology and concepts to data acquisition, management and interpretation;
- using commercial contractors wherever possible; and
- developing better communications with industry, especially by way of staff exchanges.

Recommendation 8

(a) The chairman of the Advisory Council and Director BMR liaise with the Minister for Resources in the formulation of the annual BMR program; and the Advisory Council formally endorse the program prior to its submission to the Minister for approval.

(b) Industry representation on the Advisory Council be increased from 2 to 4, State/NT representation from 1 to 2, and the term of appointment of members be increased from the present 2 year period. Consideration be given to establishing a dedicated secretariat to service the Council.

(c) Review and evaluation procedures be developed further by BMR in consultation with the Advisory Council, to monitor the effectiveness and efficiency of the program; projects be formally reviewed against specified performance indicators on a regular basis.

Recommendation 9

The Advisory Council critically review the BMR program in terms of its relevance and balance, with a view to substantially reducing the number of individual projects by terminating or redirecting projects which are inconsistent with the new charter or priorities.

Recommendation 10

(a) A specialist advisory group be formed to assist in identifying survey targets, establishing priorities and advising on appropriate technology for the Continental Margins Program; such as a group might appropriately be a sub-committee of the BMR Advisory Council.

(b) BMR's involvement in the Ocean Drilling Program be reviewed in the light of other priorities prior to any extension of the current 3 year commitment.

Recommendation 11

(a) BMR dispose of its in-house onshore seismic data acquisition capacity as soon as practicable and thereafter carry out seismic surveys by contract.

(b) Increased collaboration and financial support be sought for the deep seismic profiling program, through ACORP and other bodies as appropriate.

Recommendation 12

BMR dispose of its drill rigs and thereafter utilise contract drilling services.

Recommendation 13

BMR dispose of its aircraft after completion of the current airborne reconnaissance geophysical program in 1991 with any future airborne data acquisition asnd processing being done by commercial contractors.

Recommendation 14

(a) The Geophysics Division be abolished and non-observatory geophysical functions be integrated into two land-based multidisciplinary research divisions oriented towards program objectives.

(b) The Resource Assessment Division be abolished with geoscientific resource assessment transferred to the appropriate research divisions in BMR and rationalised, and industry-related statistical/analytical/economic activities (approximately 30 positions) transferred to appropriate other areas of the Department.

(c) All corporate management functions, geoscience computing and database functions, cartographic and engineering services, and geophysical observatory functions, be located in a new Corporate Services and Information Division headed by a professional manager.

(d) An Observatories Branch be created within the Corporate Services and Information Division and the Advisory Council further review the observatory functions in the context of overall program priorities.

Recommendation 15

(a) All scientific, engineering, and technical staff in BMR be included in a system of merit promotion along the lines of the scheme operating in CSIRO. Staff assessment criteria should encourage the production of maps and data sets.

(b) Recruitment guidelines be developed by BMR that maximise staffing flexibility while maintaining broadly based scientific effort. Where possible, specialist work be carried out on contract or by staff recruited on a fixed-term employment basis. As a matter of immediate priority, BMR should emphasise recruitment of recent graduates and staff with relevant industry experience, and consideration should be given to re-introduction of a Cadet scheme.

(c) A policy on early retirement/redundancy/retraining be put in place and early retirement/redundancy packages be offered where staff cannot be effectively redeployed to meet the requirements of BMR's program priorities.

Recommendation 16

External management consultants be appointed or a Departmental task force be formed to develop management and operational procedures appropriate to the BMR's new charter, advise on implementation of proposed organisational changes and match resources with program to identify optimum staffing levels.

Recommendation 17

Options for increasing cost recovery be pursued through:

- joint projects with the States/NT and industry.
- actively seeking external funding for research programs.
- incorporation of an appropriate cost recovery margin in the sale of printed, copied and published products.
- accelerated release of raw data.
- review of all publications and data releases to identify target markets and full extent of costs involved; if necessary obtain professional marketing advice.
- development of appropriate cost sharing arrangements with the States/NT for operation of the seismological observatory network and review of pricing policy for provision of geophysical observatory data to end users.
- contracting out of excess 'Rig Seismic' capacity as appropriate.
- introduction of a Technical Briefing Fee for consultancy services to industry and where appropriate contracting out of specialist BMR services on a full cost recovery basis.
- designation of an officer to promote and co-ordinate cost recovery and marketing efforts; to be given priority in the new Corporate Services and Information Divison.

Recommendation 18

Revenue retention arrangements from the provision of products and services and sale of surplus assets be develoed so as to encourage improved levels of cost recovery.

(Source: Review of the Bureau of Mineral Resources, Geology and Geophysics - a report to the Minister for Resources by Mr A.J. Woods, AO, December 1988, pages 3-12. Australian Government Publishing Service. Commonwealth of Australia Copyright. Reproduced with permission).

ASEG People Profile

Mike Asten, 1st Vice President 1992

Michael Asten, ASEG Vice-President, is a Senior Project Geophysicist with BHP Minerals International. He is based in Hawthorn, Victoria, and has a world-wide responsibility in BHP for research and development matters in geophysics.

He originally graduated in Physics from the University of Tasmania, taking Geology I as a fill-in subject. The stimulus of Prof. Sam Carey, a pioneer of continental drift tectonics (in the 1960's when continental drift was emerging from the status of being a heresy in western-world geoscience), attracted Michael into further geoscience studies, which culminated in a geology major and geophysics honours in 1972.

A chance encounter with Ken McCracken (then the Chief of the newly founded CSIRO Division of Mineral Physics) sent Michael north to Macquarie University, to join the graduate school in geophysics, founded by Prof. Keeva Vozoff. They were stimulating years when Keeva's 3-ton truck and 5-ton army surplus caravan rolled through western NSW and South Australia, with a squadron of BMR support vehicles, acquiring and processing magneto-telluric data. An even more esoteric natural field technique, involving seismic array studies of microseisms and their use in detecting basement below sedimentary basins, formed Michael's own research project.

Armed with a PhD and an ideal, he headed to West Africa at Christmas 1976, to lecture in an MSc course in Applied Geophysics at Ahmadu Bello University, Nigeria.

"Working with the students proved a rewarding experience, but the complexities of life in a country striving for nationhood amidst ethnic tensions, and for equality in the distribution of petroleum revenues, proved challenging," comments Michael.

Two years later, he met up with Hugh Rutter, who was building a geophysics team at BHP. The result was that Michael moved to Brisbane in 1979 to work with Phil Harman in the early days of application of geophysics to the coal industry. In particular, this was the time of the foundation of in-seam seismic techniques in Australia.

"I noticed the parallels between the wave equations and displacement structures applicable to coal seams on the one hand, and seismic surface-wave interactions with continental-scale rifts on the other hand. After some successful pilot modelling studies with seismologist Laurie Drake, we saw this analogy develop into a major 3 year project involving Macquarie University, BHP Research, CSIRO and government-funded scientific exchange visits between interested Australian and German scientists."

It's very satisfying to hear a decade later that output from this seismic modelling project is a routinely used tool for detection, recognition and interpretation of potentially costly obstructions in Australian coal mines.

Michael's transfer to Melbourne in 1981 brought a progressive shift to problems of hard-rock geophysics. Ten years of interaction with Art Raiche at CSIRO Exploration Geoscience, and other TEM specialists, has been part of a steady move by the industry towards new applications in transient EM sounding, interpretation and modelling methodologies.

Michael Asten is Associate Editor (Mining Geophysics) for "Geophysics" and an occasional honorary lecturer at several Australian Universities. Looking to the future he says,

"Our greatest challenges lie in integration of geophysical data and interpretation technologies to yield images of physical properties, with geologically meaningful spatial relationships. In this context, airborne magnetic surveys are maturing, airborne TEM methods are adolescent, and airborne gravity is perhaps a twinkle in the eye."

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ASEG Branch News

Victoria

June Meeting

Matt Fittall, a petroleum Geologist from BHP Petroleum, presented "The HV11 3D Survey. Skua/Swift Geology Revealed". The talk detailed the structural history of the Skua/Swift area, which shows wider implications for the surrounding Timor Sea region. This structural history was revealed by the HV11 3D survey which demonstrates the value of 3D seismic surveys as tools for exploration. The talk was well illustrated by a very colourful and revealing array of diagrams and image-processed data.

July Meeting

Dr Mark Jessell of the Victorian Institute of Earth and Planetary Sciences, Monash University, spoke about and demonstrated a soon to be released software package in his talk "Integrated Structural and Geophysical Modelling". The following is an abstract for the talk:

Airborne magnetic and gravity surveys have become increasingly important contributors to the development of structural models in poorly exposed or complex terrains. Through an improved understanding of how geologically realistic structures interact to produce complex geophysical signatures, it is possible to greatly improve our understanding of regional datasets. For too long the concept of integrated structural and geophysical modelling has languished as a result of what we might call the "buried object" approach.

The utility of three dimensional geophysical modelling packages is currently constrained by the difficulty in describing and manipulating the complex geometrics associated with three dimensional geology. Using a new package developed at Monash University, the structure of a region is defined not as a set of arbitrary geometric elements, but rather as the end product of a series of geological "events" superimposed on an initial layer cake stratigraphy. These events can be structural (folds, faults, shear zones, tilts), igneous (dykes and plugs) or sedimentary (unconformities), and can be combined in any order. The package can then calculate gravity and magnetic anomaly patterns for these structures, and through an interactive process, a model which recognises both structural and geophysical constraints can be developed.

Dr Jessell demonstrated the utility of the software using large-screen projection equipment at the close of the meeting.

Bob Harms
Secretary

New South Wales

The local branch held meetings in both June and July. Our first guest speaker was expatriate Australian **Dr. Robert Withers** from Arco Exploration and Production Company in Dallas. His presentation was particularly candid. The carefully integrated model for overlying basalt thickness (in the Columbia basin, USA) generated from a variety of geophysical tools, still didn't prevent Arco from terminating the Hanna #1 well, in basalt, several thousand feet thicker than prognosed!! Another (well documented) lesson on the non-uniqueness of geophysical solutions.

Our second speaker, **Dr. Graham Bradley**, a Sydney based consultant explorationist, transferred attention to the Antarctic - "The Coal Geology of the Mt Bastion Area, Trans Antarctic Mountains" to be precise. His New Zealand D.S.I.R. sponsored expedition to sample and map Permo-Triassic coals during the summer of 1984/85 gave Graham a rare perspective of a fascinating part of the world, illustrated by slides of the spectacular Antarctic scenery.

The branch executive are currently processing a questionnaire, recently circulated to the NSW branch, in order to gauge how meetings can be tailored to the needs of members. We will review the results, if significant, in a future issue of "Preview".

Juliet Szabados
Secretary

South Australia

The July meeting of the SA Branch featured **Professor Colin Reeves** of the BMR's mapping section who presented a talk on "Geological Inferences from Geophysical Maps: Promises, Pitfalls and Perceptions" (abstract follows).

Geological Inferences from Geophysical Maps: Promises, Pitfalls and Perceptions.

Geophysical maps - of gravity anomalies, aeromagnetic anomalies, natural radioactivity - have earned a place in geoscience as fundamental data sets which must be acquired at considerable cost and ignored only at the user's peril. No other methods offer, at such low cost per unit area, a viable alternative 'window' for exploration of (buried) geological structures and lithology.

To fully exploit these methods in a knowledgeable and scientific way the user must be aware not only of their potential, but also of their limitations. Several of these, such as non-uniqueness, lack of resolution and lack of physical property contrasts, are predicted by simple theory.

Other limitations, such as the quality of surveys and the accuracy of gridding, are becoming more evident as our skill at imaging geophysical data to maximise the visibility of the information content (or signal) leads also to increased awareness of the noise.

Nevertheless, qualitative interpretation of map and profile data by human beings has some inherent advantages which can be set against the foregoing limitations. Geological features do not need to be perfectly defined in order for their expression in a geophysical data set to trigger the perception of a human interpreter. particularly with some independent a priori information, many identifications of geological features may quickly become 'beyond all reasonable doubt' in the hands of an experienced geoscientist who draws on a fund which includes both (1) the general principles of his geological knowledge ('text-book knowledge') and (2) experience of specific examples in other project areas ('atlas knowledge').

We have seen excellent progress in improving survey specifications and the quality of geophysical imaging in recent years. The time is probably ripe to start putting renewed effort into information extraction itself. Better marshalling of our 'atlas knowledge' and improved integration with other geo-data will undoubtedly be an important part of this process.

This talk provided all present with a grasp of the spread of geophysical data available and outlined the BMR's plans to increase coverage in some areas. Nick Dunstan of SADME followed Professor Reeves talk with an update on an NGMA/SADME project to produce 1:1,000,000 scale images of the magnetic map of SA incorporating all available open file data.

A dinner in honour of **Professor David Boyd** was held at Fernilee Lodge on 29 July. Fifty-five attended this special function to make a thoroughly enjoyable evening. **David Tucker** gave a very enlightening talk on Professor Boyd highlighting some of his exploits and his varied interests. Professor Boyd gave an equally entertaining reply discussing some of his earlier experiences within the field of geophysics and how this field has grown in the past 20 years. (we hope to submit to Preview a copy of the talks given in the near future). A feature of Professor Boyd's talk was the early vintage geophone (all 5kg of it), slide rule and vintage 'computer' displayed as a reminder to us all of how the field of geophysics has progressed and how reliant we have all become on the computing power of today. A momento of the occasion was presented to Professor Boyd, along with the thanks of many a geophysicist.

The August meeting was a case study utilising induced polarisation data from the Olary Block in the east of South Australia presented by **David Tucker** of Preview Resources. The talk focussed on how much of the earlier IP data is only now being fully evaluated due to the way modern computing software is able to utilise the full data set and present this data in a more readily interpretable format. An extensive discussion followed regarding the original data set and the features identified in the re-evaluation of the data.

Future activities of the SA Branch are:

Sept 15	Pre ASEG conference presentations (3)
Oct 13	Don Robinson of Grant-Tensor (formerly of Oklahoma Seismic)
Nov 10 or 17	Students Night

Ashley Duckett
Secretary

Queensland

A Branch meeting was held in Brisbane in July in which **Scott MacInnes**, Managing Geophysicist for Zonge Engineering in Australia, presented an overview of recent developments in Electromagnetic prospecting. The talk featured a discussion on instrumentation developments and likely improvements in coming years, in particular with regard to Time-Domain EM systems. An outline of improved interpretation techniques was presented, including the application of smooth-modelling inversion methods to both TEM and CSAMT data.

An important development for the ASEG Qld Branch is the formation of the **University of Queensland Students Geophysical Society** as an affiliated group within the ASEG. It is hoped that through this group, a closer association between practising geophysicists and students will emerge, leading to a better understanding of the opportunities and requirements within the profession.

Forthcoming events for the Branch include participation in the 1992 Qld PESA ASEG - ODCAA-SPE Symposium on "Exploration and Development of Queenslands Hydrocarbon Resources", to be held 2nd September at Lennons Hotel Brisbane. A branch meeting on seismic processing is also planned for Tuesday 8th September. Details from V. Kissitch (07) 854 1488.

The main event coming up is the ASEG Conference at the Gold Coast 5-9th October. The program is in place and registrations are looking good. We hope to see as many members as possible help us make this a great conference.

Voya Kissitch
Secretary

ACT

The ACT Branch of ASEG has been relatively inactive during the first half of 1992. However a large proportion of members of the ASEG employed by the Bureau of Mineral Resources (BMR) have been very active over the last 3 weeks, following the leaking to the press of a proposed re-structure of BMR by the transfer of the majority of its functions to CSIRO. The proposed re-structure by several Federal Ministers was without suitable consultation with both the mineral and petroleum industries, and staff in BMR.

The catalyst for the re-structure appears to be a review in providing $140 m in funds for the construction of a new building for BMR (financial wizards strike again!). The press leak has resulted in a unified support by BMR and the mineral and petroleum industries, in attacking the Federal Government over the proposed restructure. A disseminated BMR has been viewed as a long term disaster in the support by government in the search for resources for the benefit of Australia as a whole.

A press release by government has resulted in an inquiry over the next 12 months on whether BMR should be established as a separate Institute in CSIRO, or remain within the

Department of Primary Industries and Energy or some other arrangement. Resource assessment resources in BMR will be merged with the Bureau of Rural Resources to become the Australian Bureau of Agriculture and Resource Science.

The name of the BMR will change to the Australian Geological Survey Organisation with its primary role of geological mapping (including geophysics) and associated research. (See details pp 1 to 8 - Ed)

K.D. Wake-Dyster
Secretary

Western Australia

Since the last PREVIEW edition ASEG (WA) has had a technical presentation by **Luke Swift** from Geoterrex on The Geological Application of High Resolution Aeromagnetic and Radiometric Data in the Bathurst Area, NSW. Originally scheduled for July 8, the presentation was actually given on the 15th to a small but loyal crowd! (Apologies to everyone who turned up at the Raffles on the 8th - but it was very pleasant watching the sun go down).

We had a beer tasting night at the start of August. Again, a small but loyal crowd who now know that Bombay Bitter is a health risk.

September will see us giving ASEG Gold Coast speakers the opportunity of a dry run in front of a home crowd.

Hope to see you all there.

Andie Lambourne
Secretary

P.S.3D Seismic Exploration Workshop - part of SEG's continuing Education Program, will be held in Perth 14-16 October 1992 - Details from: Mick Micenko, (09) 481 8555 or Danny Burns (09) 481 5555. (Details printed June Preview p 6)

ASEG Research Foundation

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

SHELL DEVELOPMENT (AUST) PTY LTD $5,000

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ASEG RESEARCH FOUNDATION

Post to: Treasurer, ASEG Research Foundation
Peter Priest, 39 Ningana Ave, KINGS PARK, SA 5034

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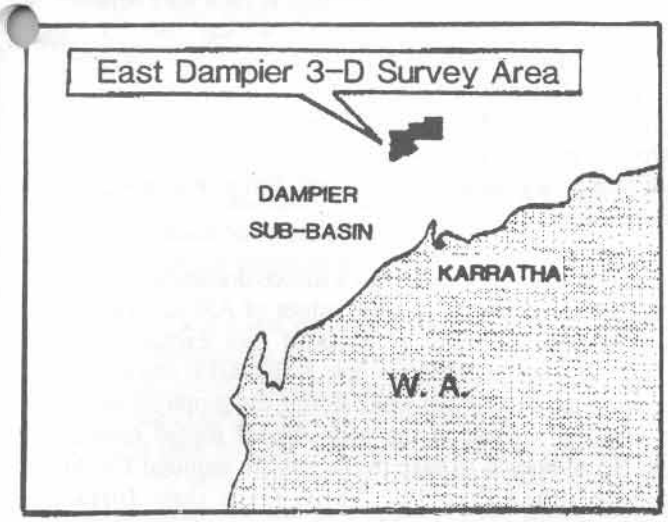
Woodside's East Dampier 3-D Marine Seismic Survey

Peter Vaughan
Principal Geophysicist Woodside

In February 1992, Woodside on behalf of the North West Shelf Project and Joint Venture Participants commenced acquisition of the East Dampier 3-D seismic survey. The survey (see location below) will cover a total of 2,746 sq km in Exploration Permit WA-28-P and the Production Licence Areas WA-1-L to WA-6-l and WA-9-L. The survey is estimated to take 11 months to complete and 18 months to process the data.



Larger marine surveys, in areal extent, have been acquired in the Northern Hemisphere, however, this survey will require more data per square kilometre and therefore rates as the largest survey ever in the amount of data recorded.

The objectives of the survey are to seismically define all potential leads and prospects in the prospective eastern portion of the Dampier sub-basin with a high quality 3-D grid. This will enable a detailed assessment of the areas's hydrocarbon potential to be made on a uniform high quality data set and to plan future drilling locations in the area.

The acquisition is being performed by the 71 metre vessel, the Western Geophysical R/V "Western Legend" which was launched in Norway in November 1991. The "Western Legend" (see opposite) is one of the most sophisticated seismic vessels available in the world today. The vessel acquires six subsurface lines, spaced at 25 metres, in one boat pass. This coverage is achieved by towing 3 x 320 channel, digital, fibre-optic streamers each containing 5000 hydrophones, in conjunction with a dual airgun energy source firing alternately at 25 metre increments. A total of 140,000kms of data will be acquired at a rate of up to 1000 line kms/day (c.f. acquisition rates of 100kms/day a few years ago. The multi-source/streamer configuration enables production rates of 250 sq km per month to be achieved. This factor means that large 3-D surveys can now be acquired in a short time frame as well as at greatly reduced costs compared to the single source/streamer configuration of the past. The 3-D technique has now become an intrinsic part of exploration strategy and not just a development tool as it was a decade ago.

Seismic data on the North West Shelf has always had a problem with multiples which become superimposed over and mask the real reflections. In an attempt to reduce the multiple content in the final data, as well as improve the sub-surface imaging of deeper targets, 4,000 metre streamers are being used. It is envisaged that the longer streamers will give an improvement in data quality at depth.

Multi-source/streamer 3-D surveys require very accurate navigation for both the vessel positioning as well as the source and streamer positions. For this survey the vessel is positioned using an ARGO radio navigation system with five base stations on shore, while an auxiliary system using Differential Global Positioning System (DGPS) is also operational for verification of the ARGO positioning system. Accurate source and streamer positioning is achieved with in-water acoustic networks at the front, middle and far ends of the streamers. The acoustics are used to verify cable separation. Cable compasses are placed at regular intervals along each stramer and DGPS positioned tailbuoys are used at the end of the streamers to close the positioning network. The processing of the navigation data for seismic surveys has developed to the stage where it is now performed onboard the vessel, thereby minimizing delays to the seismic data processing.

The data volumes generated by this project are extremely high. The survey will produce 60,000 9 track field tapes of 200Mb capacity each, totalling 12,000 Gigabytes of field data. Data volume will be reduced to approximately 3000 Gbytes on processing. The total field and processed data volume of 15,000 Gbytes represents 200 times the complete Landsat TM scene coverage of Australia (complete TM coverage is 300 scenes at 250Mb per scene). Transmission of such large volumes of data from the field to the processing centre is currently impractical.

The "Western Legend" on survey. Inset: the vessels central control room.

The seismic data is being processed by Halliburton Geophysical Services using a Melbourne based processing facility, which has five times the previous HGS processing capability, with computer links to both their Sydney and Perth processing centres. The enormous size of this project has meant that the area has been sub-divided into five discrete areas for processing and interpretation purposes. Previous 3-D surveys in the area will be merged into the final product covering a total of 3,900 sq km (62.4 x 62.4 kms) equivalent to give a full 3-D picture over the eastern portion of the Dampier Sub-basin. Advanced interpretation techniques utilising high-powered work stations will be applied, and will include amplitude mapping and enhanced image processing.

WOODSIDE
AUSTRALIAN ENERGY

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Hands-on Geophysics Activities

Broken Hill is the home of a developing, innovative Mining Museum. The Museum's Patron, Professor Ian Plimer of the University of Melbourne School of Earth Science, has asked whether the ASEG can help in setting up an exploration "activity trail" at the Museum.

An open space at the rear of the Museum, presently a car park, will be developed as an "exploration lease", with targets of various kinds buried within it. Museum visitors will be encouraged to use geophysical tools - magnetometers and EM systems and the obvious choices - to explore for these targets. Apart from the obvious aim of showing "How it works" we can also show that exploration can be benign, and not necessarily invasive or damaging. Professor Plimer emphasises that real geophysical tools should be used, and not simply rely on conventional metal detectors.

The Executive has briefly considered this, and calls for offers of assistance, ideas, or suitable equipment from the ASEG members. For immediate impact, we should probably rely on analogue instruments, such as fluxgate magnetometers and frequency-domain EM systems. Expressions of interest can be directed to **Professor Plimer** or **Lindsay Thomas** at Melbourne Earth Sciences, or to the Museum at Broken Hill.

A successful development of this kind at Broken Hill could well be emulated in other technological museums around Australia, each time improving the understanding of our science and profession.

ASEG Standards Committee Report

ASEG-GDF General Data Format

Considerable background work and debate have occurred during the last year as the standard passes through a new growth stage. Some large Australian explorers have presented considerable objection to the use of the standard for exchange of airborne geophysical data. Most objections are based on misinformation but have their grounds in difficulties with the installation of the ASEG supplied source code. In essence, the code has been confused with the Standard.

David Pratt has accepted the challenge and has organised a series of Standards Meetings in each state between airborne processing contractors and Geological Surveys. To date meetings have been held in Perth, Adelaide and Canberra. Meetings are planned for Sydney, Melbourne and Brisbane. A comprehensive list of individuals and organisation is being prepared to provide assistance with the standard. This will include minor telephone support, consulting assistance and contractor services.

Along with these meetings a source document is being prepared that illustrates a specific subset of ASEG-GDF that can be used for airborne geophysical data exchange and archiving. This document shows how ASEG-GDF can be used to document the data format while storing the geophysical data in an identical manner to the conventional record oriented format. No additional storage overheads are required for this procedure other than the ASEG-GDF tape format documentation. This sub-set addresses many issues raised by exploration companies while still providing the automatic ability to decode a data tape for direct input to a GIS system.

The ASEG source code is robust and well engineered, but difficult to implement for most organisations. Most of the perceived problems with the standard arise from this difficulty and the general nature of ASEG-GDF. The problems with the implementation are largely historic but need further work and active support from the industry. David Pratt is separating the tape access routines into a modular library that can be easily moved across different hardware platforms. The internal code documentation and supporting information needs to be updated along with additions for the current generation of hardware. Further industry support for this phase would be helpful.

ASEG-GDF has been used extensively for submission of airborne geophysical data to government. The NSW, SA, QLD, NT Governments request data to be supplied in this format. Much of the data stored over the last five years exists in ASEG-GDF format. The BMR can also supply their data in ASEG-GDF format. The standard is not being used extensively to exchange data between exploration companies, unless the data is already in that format. Making this simpler is the current challenge for the ASEG-GDF Sub-committee.

ASEG-GXF Grid Exchange Format

Steve Collins has invested an enormous amount of personal time in bringing the ASEG-GXF standard to fruition. His contributions are gratefully acknowledged by the Standards Committee. This standard provides a flexible method for the exchange of multi-layered grid data sets between different hardware platforms. This was due to be finalised at the last ASEG Conference in Sydney but parallel developments in Canada through KEGS/CSEG prompted Steve to work co-operatively with Ian McLeod from Geosoft to produce a common grid exchange standard. The best components of both systems were combined to produce a new exchange standard.

The novel part of his contribution is the use of variable radix encoding procedure for binary data that provides significant data compression over conventional ASCII data exchange procedures. In some cases it has been possible to achieve compressions in excess of 90%. Large grids can be exchanged on floppy diskettes.

Steve has submitted the standard for publication in Exploration Geophysics and has prepared a set of Fortran source code routines that supports both import and export of ASEG-GXF grids. The disk is available from Steve at nominal reproduction costs. In addition, Steve has supplied a previewing utility for IBM PC compatible computers with VGA graphics capabilities. The Standards Committee will be encouraging various Australian Software developers to include ASEG-GXF as an import/export option in their products.

AMDEX is a new standard being developed by AMIRA under the sponsorship of 13 Australian organisations. The principal objective is to look at the exchange of all geotechnical data and include geological, geochemical, cadastral and geophysical data options. We believe that this standard will become a very important vehicle for general data exchange in the next 5 years. The standard addresses the wider issues of geographic information systems (GIS) data exchange. Geophysical data is a subset of GIS.

The principles of this standard are similar in objectives to ASEG-GDF but provide a mechanism to handle much more complex data relationships. This is necessary when handling geological and cadastral information.

AMDFX has not been developed from scratch by AMIRA. It is based on the Spatial Data Transfer Standard (SDTS) developed by the US Geological Survey over the last 10 years. Because the standard is very general, it is necessary to set up application profile specifications. A profile defines the way in which geotechnical data will be transferred. It defines naming conventions and the data structures. An equivalent to this in ASEG-GDF is the airborne geophysical data exchange sub-set recommendations.

This standard is very complex and will need to be supported by the major software vendors as the implementation of the access routines is not a trivial exercise. Source codes will be available at nominal cost. AMIRA has indicated that they would like to make a formal presentation to the ASEG on the nature of the standard and its value.

Seismic and Logging Standards

New standards are emerging from SEG and AAPG for both seismic and well logging. These standards are important to Australian exploration geophysics for the storage, exchange and processing of this data. There is not representation on the Standards Committee to cover this area. The Committee is actively seeking interested members to participate in the active assessment and documentation of new standards.

Dave Pratt

ASEG 9th Geophysical Conference & Exhibition

ASEG 9th Geophysical Conference and Exhibition

The Australian Society of Exploration Geophysicists 9th Geophysical Conference & Exhibition will be held from 5 to 8 October 1992 at Hotel Conrad & Jupiters Casino, Gold Coast. The technical program has been planned around the theme, ***Improved Technologies, Revised Solutions***.

With approximately 50% of all technical papers addressing petroleum topics, the conference is a unique opportunity for petroleum geophysicists to keep abreast of Australian and international developments in their industry.

PETROLEUM PROGRAM

The conference provides a condensed forum for research geophysicists from major Australian and international organisations to outline different approaches to topical seismic processing technologies such as pre-stack depth migration and 3-D dip moveout. Practical examples from Australia and overseas are included.

Technical sessions address emerging technologies including seismic tomography, petroleum supercomputing, and novel 3-component and neural-network signal processing concepts. Other specialist sessions of direct interest to the working petroleum geophysicist include case histories on seismic acquisition and interpretation, the application of magnetotellurics to petroleum exploration, and basin development.

PETROLEUM KEYNOTE SPEAKERS

Two internationally renowned leaders in petroleum geophysics will present the opening and closing keynote presentations at the conference.

The opening keynote speaker, **Dr Sven Trietel**, Amoco Production Co, USA, has made a significant contribution to seismic exploration since the formative years of digital seismology. His in-depth understanding of the science is complemented by a unique skill in transmitting his knowledge to others.

Dr Treitel is currently working in the area of reservoir geophysics. His keynote address, *Reservoir Geophysics: Improved Technologies, Revised Solutions*, will challenge geophysicists to consider the future potential of improved technologies including borehole-to-borehole seismic and electromagnetic tomography.

Dr William French, SEG President and Chief Executive Officer, Grant Tensor Geophysical Corporation, will present the closing keynote address. Dr French brings to the conference a blend of distinguished geophysical research with corporate and administrative experience. He is in an unique position to provide delegates with an accurate insight into current developments in the petroleum industry.

CONFERENCE PROGRAM UPDATE

- The conference organising committee is pleased to announce the addition of Professor Dan Loewenthal, Massachusetts Institute of Technology, to the technical program. Dr Loewenthal's paper in entitled Corpsular Straight Trajectories versus Rays in Layered Media.

- Other additions to the technical program include Dr Jason Kao and David Caliga, Cray Research Inc, Minnesota, USA. Dr Kao will present, A practical implementation of the multi-processing 3-D Kirchoff migration scheme on the Cray Y-MP systems. David Caliga will present Issues for seismic data movement in a heterogeneous scalar-vector-parallel computing environment.

WORKSHOP REMINDER

Registrations are still being accepted for several of the pre and post-conference workshops.

For further information on workshops please contact the conference secretariat at the following address:

ASEG 9th Geophysical Conference and Exhibition
P.O. Box 1280
MILTON QLD 4064
TEL: (07) 369 0477
FAX: (07) 369 1512

TRADE EXHIBITION UPDATE

More than 45 exhibitors from throughout Australia and overseas have confirmed their participation in the trade exhibition. The exhibition offers a unique opportunity to experience first-hand the latest developments in geophysical instrumentation, communications technology, and computer systems for geophysical acquisition analysis and image processing.

Displays will include:

Seismic acquisition & processing	Well logging
Magnetic and EM techniques	Mapping & Modelling
Interpretation packages	Hardware and software
Government services	Communications
Information services	Data storage

SEISMIC WORKSTATION COMMON DATA SET

A seismic data set has been made available to exhibitors of interactive workstations, courtesy of BHP/Esso. The data set, including 2D and 3D seismic with well data is from the Flounder field in the Gippsland Basin. This data set will enable prospective pruchasers and users of workstations to make more direct comparison between vendors. It also enables those vendors to highlight differences in the products.

For further information contact:
Henk Van Paridon, Co-Chairman
Conference Organising Committee,
Tel: (07) 221 6516.

DESTINATION..... GOLD COAST

The conference destination was selected for its relaxed atmosphere and the extensive array of activities available to delegates and their companions before, during and after the event. Included in the conference social program is the *Calypso Carnival* welcome function, at which delegates and exhibitors can relax and enjoy Queensland style hospitality before the technical sessions begin. After the conference why not join our golf day at one of the Gold Coast's premier courses, Robina Woods Golf Course. Whether travelling alone, or with your family, take the opportunity to spend some extra time at Queensland's famous Gold Coast before travelling home.

REGISTRATION

Fulltime conference registration is available from $430. Alternatively, a day registration fee of $255 is available for delegates wishing to attend for one day only.

For further information regarding any aspect of the conference please contact the conference secretariat at the following address.

ASEG 9th Geophysical Conference and Exhibition
P.O. Box 1280
MILTON QLD 4064
Tel: (07) 369 0477
Fax: (07) 369 1512

ASEG 9th Geophysical Conference and Exhibition

Gerald W. Hohmann Memorial Fund

Stan Ward

Gerald W. (Jerry) Hohmann died May 23, 1992, from complications related to a bone marrow transplant nad chemotherapy intended to combat multiple myeloma, a form of bone cancer. Jerry was Professor of Geology and Geophysics at the University of Utah and an international leader in electromagnetic methods in applied geophysics. A memorial to Jerry will appear in the August 1992 issue of *Geophysics: The Leading Edge*, a publication of the Society of Exploration Geophysicists (SEG). See also June, 1992 ASEG *Preview* (P.6).

A trust fund will be established to accommodate those who wish to contribute to an active memorial to Jerry's work as a scientist and teacher. The trust fund will support one or more of four levels of activity in electromagnetic methods in applied geophysics:

- An endowed university professorship or chair,
- Graduate or post-graduate research fellowships,
- Undergraduate scholarships,
- An annual award to be given through a professional society such as the SEG, EAEG, or ASEG.

The steering committee for the fund will be comprised of members of the international exploration geophysics community. An Executive Committee for the fund and trustees with signatory authority will be established quickly. Meanwhile, contributions may be sent to a fund established by Jerry's wife, Aileen, as follows:

Gerald W. Hohmann Memorial Fund
Account Number: 179-105193-014
Dean Witter Reynolds Inc.
Attn: Nick M. Bapis
2645 East Parleys Way
Salt Lake City, Utah 84109
(801) 486-9217
(800) 735-1238

Cheques should be made to Dean Witter for the Gerald W. Hohmann Memorial Fund, Account No. 179-105193-014. This Memorial Fund will later be converted to a trust fund.

A contribution now with a pledge for future years would be very much appreciated. Donors should also examine the possibility of obtaining matching donations from their employers, from foundations or other sources the may know about. Matching donations will help the memorial fund grow much more quickly. Donors may identify one or more of the above activities that their contributions are intended to support.

Industry-Government Initiative Australian Mineral Exploration

As part of a Government initiative to stimulate the national R&D capability, a Cooperative Research Centre for Australian Mineral Exploration Technologies was set up in July. This centre is to develop core technologies, particularly airborne methods, for the discovery of orebodies concealed by the complex, conductive regolith. This goal was selected in response to the industry's demand for improved exploration methods and includes two key issues, airborne geophysics and regolith studies. Research will be focused into programs for providing more efficient, cost effective mineral exploration in Australia. The Geophysical Exploration Methods Program, under Dr. Jim Macnae, will develop electromagnetic and potential field exploration methods to detect mineralisation in the presence of the regolith. The Regolith Characteristics Program, under Dr. Ray Smith, will define the regolith characteristics of important exploration districts and provide the capability to extend the mapping to the regional scales compatible with airborne geophysical methods. Such maps will then provide the surface boundary conditions to constrain the interpretation of geophysical data. Director of the CRC is Dr. Andy Green of the CSIRO Division of Exploration Geoscience.

In addition to its R&D programs, the CRC has an Education and Training Program which, from next year, will offer undergraduate and Honours Scholarships, mount a new Masters course in Mineral Exploration Technologies, and organise a variety of short courses, workshops and seminars. The Masters course, offered jointly by Curtin and Macquarie Universities, is modelled on the highly successful two-year part-time industry Masters and MSc programs in Economic Geology at James Cook University, the University of Western Australia and the University of Tasmania. The first of the workshops planned is an update of the 1985 DHEM "seminar", and will be convened by Drs. John Bishop nad Roger Lewis at Macquarie University in June, 1993.

While it is hoped that the entire exploration industry will participate in the CRC, core participants are CSIRO Division of Exploration Geoscience, Macquarie and Curtin Universities, World Geoscience Corp. Ltd., the Geological Survey of Western Australia, the Bureau of Mineral Resources, and the Australian Mineral Industries Research Association (AMIRA).

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Phone (02 or +61-2) 887 8881
Fax (02 or +61-2) 887 8921.

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Book Review from the AMF

Mafic dykes emplacement mechanisms. Proceedings of the second International Dyke Conference, Adelaide 12-16 September 1990. Edited by A.J. Parker, P.C. Rickwood and D.H. Tucker. Rotterdam: A.A. Balkema, 1990. x, 541p.: ill., maps; 26cm. (IGCP project 257 publication; 23) Includes bibliographies. ISBN 90-6191-158-3 (Australian agent: D.A. Book (Aust) Pty Ltd, 648 Whitehorse Road, Mitcham Vic 3132) Price: Dfl 135.00, US$71.00. **OR order through AMF Bookshop.**

It is evident to those who monitor the international earth science conference circuit that specialisation has reached the stage at which almost any petrological, geochemical or even mineralogical topic can muster enough workers to justify a face-to-face exchange of views. On the subject of mafic dykes, themselves a fairly common phenomenon to the Australian geologist, this is the second such gathering. The first, which was held in Toronto, Canada, in 1985, resulted in the publication of a volume of Proceedings which for those in this field (to quote the present editors) "has become a landmark in geological research on, and exploration within, mafic dykes swarms around the world".

This volume, which was printed prior to the Conference, contains forty-eight papers, arranged under their principal theme or thrust, but with editorial explanation that many of the contributions are either of a general nature, or discuss more than one aspect of the subject, and are thus somewhat arbitrarily assigned. Being an Australian venue, there is a substantial input from local authors (twelve papers).

On the subject of emplacement mechanisms, nine papers wrestle with the rock mechanics and rheological processes by which dykes find their way into the host rocks, citing studies of prefractured hosts, crystallisation fracturing, lateral magma injection and submarine volcanism as dyke sources. J.R. Lister and R.C. Kerr of ANU develop fluid-mechanical models of dyke propagation and P.C. Rickwood of the University of NSW writes on the use of various dyke features to determine the direction of propagation. A group of nine papers focuses on aspects of geochemistry, petrology and mineralisation of dykes. A group from the University of WA (L.F. Bettenay, N.M.S. Rock and P.J. Mather) describes a suite of lamprophyre dykes in the east Pilbara; D.J. Isles and A.C. Cooke of World Geoscience Corporation, Perth , examine the relationship between dykes and gold deposits in the WA Yilgarn Block; and N.M.S. Rock summarises the disposition of lamprophyric dykes in WA. Other authors in this group present similar studies in southern Africa, USA, Brazil and Finland.

Five contributions present palaeomagnetic studies, including several relating to the Canadian Shield, and one written by P.W. Schmidt of CSIRO, North Ryde, NSW, in which he applies palaeomagnetic data from Kiama dykes to the determination of the structural evolution of the Sydney Basin. Sixteen papers are grouped as relating to Gondwana crustal tectonics, with studies reported from Guiana (South America), Nigeria, Zaire, India, together with six Australian cases: D.M. Boyd of Adelaide University and D.H. Tucker of Preview Resources Ltd, Adelaide, describe the recognition of dykes by the application of image processing techniques to aeromagnetic data; S.F. Liu and P.D. Fleming of La Trobe University discuss mafic dykes in the Adelaide Foldbelt; S. Maxwell of the University of NSW examines the geochemical characteristics of Sydney Basin dykes; P.J. Stephenson of James Cook University, Qld, presents some north Queensland dyke studies; S.P. Turner and J.D. Foden of the University of Adelaide are concerned with mafic magmatism in the Adelaide Geosyncline; and B. Zhou and K.J. Mills describe multiple dyke emplacement in the Wonominta Block of western NSW.

The final group of nine papers relates to Laurasian crustal tectonics, the authors writing on such topics as the Columbia River basalts of USA, the Avalon terrane of 'Massachusetts, USA, Greenland dyke swarms, the Lewisian Complex of Scotland, and the Siberian Platform of the USSR.

The editors are associated respectively with the South Australian Department of Mines and Energy, the University of New South Wales, and Preview Resources Pty Ltd, Adelaide, SA.

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Letters To the Editor

14 August 1992

Dear Editor,

I enjoyed John Denham's article on the History of Seismic Exploration in Australia in Preview June 1992. It is an excellent and in many ways comprehensive article providing a wealth of information for future generations of geophysicists. That being the case, I would like, for the record, to add some information and correct a few minor errors relating to the very earliest days of seismic exploration before John joined the industry in 1962.

Seismic exploration began in Australia somewhat earlier than indicated in John's article. The first geophysical survey for oil in Australia was made by the German company, Elbof, in the Roma area of Queensland in 1928-29. This was largely a gravity survey of areas northwest of Roma, but some rather primitive refraction seismic work was also done using Mintrop mechanical seismographs. Similarly, the Imperial Geophysical Experimental Survey, a joint British-Australian venture which operated from mid 1928 to early 1930, also used primitive seismic refraction equipment to investigate deep leads, probably for the first time anywhere.

The Bureau of Mineral Resources (BMR) was established in 1946. I joined BMR as a cadet in 1949 and personally participated in an engineering refraction seismic survey of the Eucumbene Dam site in the Snowy Mountains in May 1949. This was certainly not BMR's first survey of this type. We used the reciprocal time method.

BMR purchased a set of Heiland 12-channel "compander" seismic equipment from the USA in 1948. The first survey undertaken with this equipment was a reflection/refraction survey in the Oaklands-Coorabin Coalfield in Southern NSW, done in July-September 1949. However no useable reflections were obtained. The survey party then moved to the Roma area in Queensland where a reflection survey was carried out during November and December of that year. This was the first reflection seismic survey for petroleum undertaken in Australia. The seismic work was continued by BMR near Roma in 1950, and an exploratory well, AAO No. 1 was drilled on the basis of the seismic mapping.

In August and September 1951 reflection seismic surveys were done by BMR with the Heiland equipment in the Carnarvon Basin, Western Australia, where the operating company, WAPET, was planning to drill the northern end of the Giralia Anticline. A large and imposing anticline had been mapped in the surface Mesozoic and Tertiary sediments. An east-west seismic traverse by BMR across the anticline through the proposed drill site showed that the surface anticline was underlain, beneath an unconformity at a depth of about 3000 feet, by a pronounced syncline and that this was not a suitable site for a deep drilling test. This result apparently had an

enormous effect on the future of seismic exploration in Australia.

WAPET, evidently convinced of the value of seismic reflection work as an aid to exploration, revised its plans and decided that an extensive seismic survey was needed before a drilling site could be selected. The company subsequently arranged for a reflection seismic crew from Seismograph Services Limited (SSL) to commence operations in the area in early 1952. This was the first commercial seismic crew to operate in Australia. As a result of this crew's work another site was selected for a deep drilling test on an anticline more or less parallel to an to the west of the Giralia Anticline. This test was Rough Range No 1. and of course it made a large impact on the prevailing exploration climate by discovering oil, although it did not lead to commercial production.

The SSL crew employed by WAPET used 24-channel seismic equipment. BMR also re-equipped its own land seismic crew with 24-channel equipment in 1952. This crew did further reflection work around Roma in 1952 and 1953, surveys in the onshore Gippsland Basin in 1952 and 1954, and work in the Canning Basin in 1953-54. With some short gaps, BMR has operated at least one land seismic crew from 1949 to the present.

WAPET employed the original SSL crew during most of 1952 and 1953 investigating various surface structures in the northern part of the Carnarvon Basin and in the Kimberleys. During 1954 and most of 1955, the BMR crew was the only one operating, but WAPET resumed seismic work in its vast onshore Western Australian permits late in 1955 with the engagement of a GSI crew. Within two years GSI was operating three crews for WAPET. GSI introduced the use of multiple geophones and shothole patterns and was the first to use magnetic recording in Australia.

It is worth recording that the first State organisation to engage in seismic exploration was the South Australian Mines Department, which commenced using 12-channel equipment in 1956 and 24-channel equipment in 1958.

Early in 1958 the Lucky Strike Oil Company employed a Foreign Oil Company seismic crew for a survey in the Maryborough Basin, Queensland. At the conclusion of this survey in 1951, Century seismic equipment used was purchased by Geosurveys of Australia, and the first Australian seismic contracting company, Geoseismic, was formed. Geoseismic carried out its first survey in south western Queensland in 1959.

John Denham has very ably covered the history of seismic exploration from the 1960's onwards, and there is little more that I would wish to add. However, I would point out that the first marine seismic survey in Australian waters was not a survey in 1962 as John indicates but in 1961, when GSI carried out a survey for Frome Broken Hill Pty Ltd off the south western coast of Victoria.

Finally, I would like to acknowledge that much of the information I have presented here is derived from papers by Messrs R.F. Thyer, J.C. Dooley and other former BMR colleagues. I hope that this additional information will complement the wealth of information provided by John Denham.

Yours Sincerely
Colin Robertson
C.S. Robertson & Associates

21 August 1992

Dear Editor,

I was pleased to receive a copy of the letter from Col Robertson. He has the advantage of having started in the business a bit earlier than I did, so his personal experience goes back further than mine. I welcome his extending the history back further and also his correcting some of my early 'firsts'.

Yours faithfully
J.I. Denham
BHP Petroleum

Membership

NEW MEMBERS

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

Victoria

David SONG
3/1126 Burke Road
North Balwyn Vic 3104
Ph: (03) 859 3061

Peter RYAN
Esso Australia Ltd
Exploration Department
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Melbourne Vic 3001
Ph: (03) 270 3905

Silvano PAGNOZZI
C/- Petrofina Exploration Aust
Level 2, 476 St Kilda Road
Melbourne Vic 3004
Ph: (03) 867 7999

New South Wales

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Ph: (02) 632 3517

Ms Ping ZHAO
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Macquarie University
NSW 2109
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Peter EAGLETON
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Surry Hills NSW 2010
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Queensland

John McMONAGLE
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Indooroopilly Qld 4068
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John JACKSON
MIM Exploration
P.O. Box 5802 TMC
Townsville Qld 4810

Cameron WASON
137 Camberwell Crct
Robina Quays Qld 4226
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Stephen WAUCHOPE
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P.O. Box 1201
Fortitude Valley Qld 4006

South Australia

Mr Zhe JINGPING
School of Earth Sciences
The Flinders Uni of S.A.
PO 2100
Adelaide SA 5001
Ph: (08) 201 2657

Ms Shanti RAJAGOPALAN
Dept of Geology & Geophysics
Univ. of Adelaide
GPO Box 498
Adelaide SA 5001
Ph: (08) 228 4698 (w)

Overseas

Chow CHEN
Dept of Geophysics
National Central Univ.
Chung-Li
Taiwan, R.O.C.
Ph: 886-3-422 7151

WHERE ARE THEY?

Does anyone know the new address for the following members:

Mr N. BLAKE
formerly of Command Petroleum Edgecliff NSW 2027

Mr M. GILES
formerly of Tensor Pacific Port Melbourne VIC 3207

Mr M.J. FLYNN
formerly of SANTO in Adelaide SA 5001

Mr A.D. WATKINS
formerly of SE Flats, Monash Clayton VIC 3165

Mrs C.R. WRIGHT
formerly of Carlotta Street Greenwich NSW 2065

ULTRAMAR MANAGER
formerly of Ultramar Australia Inc (G. McCcaffrey), Sydney

Mr S Clauson
formerly of Raglan St Mosman NSW 2088

CHANGE OF ADDRESS

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

Western Australia

David ABBOTT
From: Inglewood WA
To: C/- Aerodata
17 Emerald Terrace
West Perth WA 6005

Gregory McKAY
From: North Sydney 2060
To: Outokumpu Exploration Aust.
1st Floor, Burswood Court
141 Burswood Road
Victoria Park WA 6100

Anthony GRIFFITHS
From: SANTOS LTD
To: Sierra Geophysics
32 Richardson Street
West Perth WA 6005

David DE PLEDGE
From: Kendenup
To: 11 Bombard Street
Ardross WA 6153

Paul Graeme WILKES
From: Herdsman WA
To: Paul Wilkes & Associates
46 Griver Street
Cottesloe, Perth WA 6011

South Australia

Michael SZCZEPANIAK
From: Highgate SA
To: SANTOS Ltd
GPO Box 2319
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Dr Shunhua CAO
From: BMR Canberra
To: School of Earth Sciences
Flinders University of SA
GPO Box 2100
Adelaide SA 5001

Steven MACKIE
From: Geosim Ltd New Zealand
To: 4/8 Robert Street
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James HANNESON
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To: Western Mining Corp
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Daw Park SA 5041

Queensland

Mark TAYLOR
From: The Gap Qld
To: Digital Exploration Ltd
54 Brookes Street
Bowen Hills Qld 4006

Grant THOMAS
From: Mt Isa Qld
To: CRA Exploratin
33 Commercial Rd
Mt Isa Qld 4825

Victoria

Alan ANDERSON
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To: BHP Petroleum
120 Collins Street Melbourne Vic 3000

New South Wales

Justin GARDNER
From: Kathleen Lumley College
To: 201b Beecroft Road
Cheltenham NSW 2119

Ned STOLZ
From: Netherby SA 5062
To: 34 Parkes Street
Ryde NSW 2112

Noel MERRICK
From: Kensington NSW
To: National Centre for
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University of Technology Sydney
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From: GEOPEKO Milton Qld
To: GEOPEKO
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Winnellie NT 0820

Roger CLIFTON
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To: Box 761
Alice Springs 0871

Overseas

Hugh DAVIES
From: Papua New Guinea
To: Geology UPNG
University NCD
Papua New Guinea

Jacques SAVERS
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To: Department of Geological Sciences
Science Laboratories. South Road
Durham, DH1 3LE. England

CORRECTION TO ADDRESS

Roger YOUNG
From: Energy Centre, Room 5114, Uni of Oklahoma
To: School of Geology & Geophysics
Energy Centre, Room 884
Uni of Oklahoma, Norman
Oklahoma 73019, USA

RESIGNATIONS

Colin GERAGHTY
From: Coniston Cl, Croydon Vic 3136

Ian FRASER
From: Dept of Mines WA - Petroleum Division
East Perth WA 6004

Leonard COLLETT
From: Bay Street, Ottawa, Ontario, Canada

Calendar Of Events

September 6-12 1992

SEISMIC REFLECTION PROFILING OF THE CONTINENTAL LITHOSPHERE
(Fifth International Symposium).
Banff, Alberta Canada
For further details:
R.M. Clowes
Lithoprobe Secretariat
6339 Stores Road
UBC Vancouver, BC, Canada V6T 1Z4

October 5-8 1992

ASEG 9TH NATIONAL CONFERENCE AND EXHIBITION
Improved Technologies, Revised Solutions.
Gold Coast, Qld
For further details:
Ms Vivienne Mackenzie
Intermedia Convention &Event Management
P.O. Box 1280
Milton QLD 4064
Tel: (07) 369 0477
Fax: (07) 369 1512

October 11-13 1992 (Melbourne)
October 14-16 1992 (Perth)

3D SEISMIC EXPLORATION
ASEG Continuing Education Workshop R. Malcolm Lansley, Alfonsso Gonzalez
For Further Details:
Melbourne: Bob Kirk, BHPP
Tel: (03) 652 657-
Fax: (03) 652 6325
Perth: Mick Micenko
Hadson Energy
TEl: (09) 481 8555
Fax: (09) 481 8881
(See also June 1992 Preview, p 6)

October 12-16 1992

UNCONVENTIONAL HYDROCARBON ACCUMULATIONS - PROBLEMS OF EXPLORATION AND PRODUCTION
St Petersburg, Russia
For further details:
VNGRI
Liteiny 3G, 1G1104
St Petersburg, Russia
Telex: 121345 PTBSU
Fax: (7-812) 273-73-87

October 25-29 1992

SEG: 62ND ANNUAL INTERNATIONAL MEETING AND EXHIBITION
New Orleans, Louisiana, USA
For further details:
Box 702740
Tulsa, OK, 74170-2740