THE VICTORIAN GEOLOGIST

February 2006

THE GEOLOGICAL SOCIETY OF AUSTRALIA
Victoria Division

Next General Meeting: Thursday 23 February

Eighty million years of ocean and climate change in Victoria: icehouse events in a predominantly greenhouse world

Stephen Gallagher

6.15 p.m. at the University of Melbourne
Fritz Loewe Theatre, Earth Sciences Building, cnr Swanston & Elgin Sts.

Preceded at 5.30 p.m. by drinks and nibbles in the tea-room, 4th floor. $2/person.

The strata of Victoria are blessed with abundant evidence of extreme climate and ocean change. Nearly 80 million years ago greenhouse conditions caused oxygen-starved marine conditions to envelope the margin of southern Australia, associated with a global anoxic event. This event happened in the absence of any ice and took place in a stagnant non-stratified ocean. Subsequently there was a gradual decline in global marine temperatures, culminating in well-developed climate variability in the last 12 millions years of the Cretaceous. While there is no evidence of ice sheets during this time, alternations of drier and wetter conditions recorded in the Gippsland Basin match orbital frequency predictions. It is possible that even in the greenhouse world of the Cretaceous ephemeral ice sheets existed in Antarctica on Milankovitch timescales; however, these ice sheets did not reach coastal areas where temperate conditions prevailed. Superb evidence for greenhouse conditions through most of the Cenozoic is well preserved, including extensive brown coal deposits and subtropical microfossil incursions. However, short-lived Antarctic glacial events during this time have also left their imprint in Victoria, especially in the marine record. Uniformitarian interpretation of the greenhouse ocean around Victoria is not possible, as the icehouse ocean of today is anomalous compared to the 80-million-year record studied. Thus when anticipating the possible consequences of Recent greenhouse change on Victoria we should look into the past beyond 3 million years for our predictions.

For up-to-date GSAV news go to www.vic.gsa.org.au

Good news from the Geological Heritage Subcommittee

Tower Hill: one of the best-preserved maars in Victoria (aerial photography by Neville Rosengren)

Tower Hill: hope for better planning in the Western District Volcanic Province

The GSAV, through the Heritage Subcommittee, appealed against the granting of a permit for a building high on the outside of the crater rim at Tower Hill (TVG, Sept & Oct 2005). The proposed development was considered inappropriate on such a scientifically important site, and was not consistent with the Shire of Moyne's own planning policies. The outcome of the VCAT hearing on 21-23 November has now been announced:

The Victorian Division received good news in the New Year: the Tower Hill building permit was overturned on appeal to VCAT. This result was the culmination of much hard work by a number of people and three days in the VCAT; an interesting if somewhat exhausting experience!

The decision is quite long and makes interesting reading in terms of heritage values especially with regards to geological and landscape issues. It is a real win for sensitive development in the volcanic province. We hope that local government takes heed of this case. The Tribunal concluded:

- That the positioning of the dwelling together with its overall proportions and shape would not produce an acceptable outcome when viewed from the Princes Highway, particularly from locations west of the site and from within the Reserve itself near the peak of the lookout.
- That the landscaping in the manner and locations proposed is not responsive to the setting, character and appearance of Tower Hill and its relationship with the adjoining grassy plains.
- That any dwelling on this site should be sited further away from the crater's edge. The tribunal appreciated that bringing development closer to the highway would result it is being more obvious from the highway. However, they believed that whilst such development would be more obvious, this would be counterbalanced by the provision of greater separation from the Reserve and that it would be seen as a more temporary element within views to the Reserve rather than a more permanent element within most views. Added to this is the outcome envisaged by the DDO2 design objectives (the planning overlay) which specifically discourage development close to the Reserve.
- The tribunal did not say that development must only be sited within the "as of right zone" on the site. However, the acceptability of a dwelling closer to the Reserve will be depend on the specific merits of the design, particularly how it responds to the volcanic landform that is such an important and significant feature in the local area.

continued ...

The tribunal therefore set aside the Shire permit and directed that no permit is to issue in this case.

As issues of geological significance were fundamental to our argument, it was very fortunate that the Division Heritage Subcommittee had been working steadily to document and assess sites. Without that data it would have been very difficult to show that we value such a site.

I would like to thank everyone who offered support and gave it as needed. GSA is very careful about how much it actually objects to development, especially as in many cases good agricultural practice does not damage geological values. In fact we often have more trouble with government authority management than farmers.

In particular GSA was very lucky to have the services of Simon Molesworth AM, QC, Dr Robert Dean and Ms Rosemary Martin who donated their time and legal expertise to help us in this case. It would have been much more difficult without them.

Anyone who is interested in the full deliberation please contact me.

Susan White
Convener Heritage Subcommittee Victoria Division

AUSTRALIAN EARTH SCIENCES CONVENTION UPDATE
Resourcing the future

Sunday 2 July to Thursday 6 July 2006
Melbourne Convention Centre

"Early Bird" Registration deadline now only days away: 28 February 2006
Go to the conference website: www.earth2006.org.au or phone (03) 9417 0888

Organisation of the convention is proceeding well. At the deadline, abstract submissions for over 450 oral presentations and 100 poster papers were received, assuring a more-than-full scientific program of up to eight concurrent sessions. Seventy of the 100 exhibition booths have been taken up, ensuring a wide range of interesting and topical exhibits. The target for sponsorship has almost been achieved, but interested parties please note: exhibition booths and sponsorship opportunities are both still available. The Platinum Sponsor for the convention is Inco, while the Victorian Department of Primary Industries and BHP Billiton have taken up Gold Sponsorship. Veritas is a Silver Sponsor, and Bronze Sponsors are Ore and Velseis.

The scientific program committee and symposia convenors are currently preparing a detailed program which will be available on the website in late February. The highlight will be the "Hot Topic" plenary presentations which will start each day. Five internationally renowned experts have agreed to be plenary speakers:

- Dr. Tim Flannery (South Australian Museum): Environmental Change
- Professor Steve Self (Open University): Volcanic eruptions and impact on climate
- Dr. Nick Sheard (Inco, Platinum Sponsor): The mining industry
- Dr. Tom Whiting (BHPB; tentatively accepted): Resources and innovation
- Dr. Robin Batterham (Rio Tinto, Chief Technologist): Energy, uranium and geosequestration

In addition, most convenors are including one or more Keynote Speakers in their program, and a program of presentations on topics topical to industry is being organised. Pre- and post-conference workshops and fieldtrips are also being held; early registration for these is recommended to avoid disappointment.

It looks like the AESC will be a great conference: great science, symposia, field trips and workshops to cater for all interests. We are particularly hoping that the Victorian geoscience community will get right behind it.

Editor's note: a detailed listing of symposia, workshops, field trips and social program can be found on the excellent conference website: www.earth2006.org.au

Vale Neil Archbold

Professor Neil Wilfred Archbold passed away while in Argentina on November 28th 2005. His untimely passing will deeply sadden all who were touched by this gifted man. Neil was appointed to a Personal Chair as a Professor of Palaeontology at Deakin University in 1995 in recognition of his outstanding contributions to geology, palaeontology and the history of science. His interests in the natural sciences were wide and his research record includes more than 170 published works. Neil was a strong promoter of the discipline of palaeontology within the local earth science community, and he will be missed for his mentoring of younger researchers and students.

Dr Mark Warne
Lecturer in Earth Sciences
School of Ecology and Environment
Deakin University (Melbourne Campus)

Editor's note: a full obituary for Neil is expected in the next edition of *The Australian Geologist*

Dates for your diary

Melbourne Mining Club "Cutting Edge" Series

When: 5.00 pm, Tuesday 14 March 2006
Where: The Supper Room, Level 3, Melbourne Town Hall, cnr Swanston & Collins Streets
Cost: Free, but registration is required
Details: Lyn Collins Ph: 03 9629 1851 Email: lyn.collins@vic.minerals.org.au

Presenters: Steve Johnson (General Manager, Alliance Resources Ltd); Kevin Robinson (Managing Director, Heemskirk Consolidated Ltd); George Sakalidis (Executive Director, Exploration Image Resources NL). The formal part of the evening will conclude at 7 p.m. when hosts KPMG and Regional Development Victoria will provide refreshments and an opportunity for informal discussion with the speakers.

Latest on the Cooper Basin: a forum hosted by PESA SA

When: Wednesday 15 March 2006
Where: AMF Auditorium, 63 Conyngham St., Glenside SA
Format: Presentations 9.30 a.m. til 2.15 p.m. followed by lunch
Cost: $40 (PESA members), $50 (non-members), $10 (students)
Bookings: Jodie Lester (08) 8224 7025 or email jodi.lester@santos.com

An opportunity to hear first-hand about the latest activities, discoveries and exploration programs from major operators. Interstate attendees especially welcome! Presenters: Ross Wecker (Innamincka Petroleum), Bob Frears (Stuart Petroleum), Neil Gibbins (Beach Petroleum), Mike Scott (Cooper Energy), Ray Shaw (Great Artesian Oil and Gas), John Chambers (Santos), and John Kopcheff (Victoria Petroleum).

Accessing Australia's Final Frontier: 7th Annual Geoscience Exploration Seminar

When: 28-29 March 2006
Where: Alice Springs Convention Centre
Details: www.minerals.nt.gov.au/ntgs

continued ...

Conference highlights include contemporary geoscience from the Arunta, Ngalia, Tennant, Tanami, Amadeus and Pine Creek regions. Key industry presentations by Adelaide Resources, Arafura Resources, Gravity Diamonds, Renison Consolidated Mines, Tennant Creek Gold and Olympia Resources. Other features include a product launch from the Regolith Landform Framework project (a NT-wide partnership with CRC LEME) and discussions with key people re amendments to the Aboriginal Land Rights Act. Enquiries to Serena Wilson, NT Geological Survey, on (08) 8999 5313 or serena.wilson@nt.gov.au

Reunite Gondwana: 2006 AAPG International Conference and Exhibition
Hosted by the Petroleum Exploration Society of Australia

When: 5-8 November 2006 (note new dates)
Where: Perth Convention and Exhibition Centre
Details: www.aapg.org/perth/

The deadline for abstracts was in January, but the extensive technical program would interest many potential attendees. The theme “Reunite Gondwana - Realize the Potential” highlights a blending of technical and commercial approaches. See the conference website for details. Preliminary short course topics include Coalbed Methane, Exploration Geochemistry, Fault Analysis, Structural Interpretation, Reservoir Prediction and a Core Workshop. Preliminary field trips will be held throughout Australia as well as to locations in Borneo, South Africa and New Zealand.

Welcome to new members ...

Marvena van Kann	...	member	Chung Leong Li	...	student member
Chris Osborne	...	member	Darren Osborne	...	student member
Adele Seymon	...	member	Madelaine Willcock	...	student member
Kent Washburn	...	member			

... and (belated) congratulations to

... GSAV member Martin Norvick, who has been announced as the 2005 PESA Australian Distinguished Lecturer. Martin will be giving a lunchtime lecture and a short course in most of the Australian capital cities as well as Wellington, NZ. According to the website www.earthsci.unimelb.edu.au, the short course will be on basin analysis, petroleum systems and play fairway mapping, while the lecture will be on the Permian-Cretaceous evolution of the northern Australian plate margins.

... postgraduate student Mark Quigley, from the University of Melbourne, who was selected as a finalist in the national Fresh Science program hosted by the State Library of Victoria in August 2005. Mark’s work shows that at least five large, landscape-changing earthquakes have affected Australia during the last 100 000 years, suggesting that the landscape in some areas (including the Flinders Ranges and Barrier Ranges) is much younger and more dynamic than previously thought. Southeastern Australia may not be such a safe place after all. Go to www.freshscience.org for more details.

... postgraduate students Angela Bush, Ivo Voss and Meghan Miller, who have been awarded GSAV grants to assist them to make presentations at various conferences. More details in next month’s newsletter.

Closing date for material for the next Victorian Geologist is Friday 3 March

If you haven’t seen the GSA’s new website, go to www.gsa.org.au

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Please address all correspondence to the GSA Victoria Division
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Internet address: www.vic.gsa.org.au

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March 2006

THE GEOLOGICAL SOCIETY OF AUSTRALIA
Victoria Division

Thursday 30 March

Four-dimensional evolution of the Western Pacific convergent margin, based on seismic tomography and palaeogeographic reconstructions

Meghan S. Miller
ANU Research School of Earth Sciences

General Meeting at 6.15 p.m. - Monash University
Lecture Theatre E7, Building 72 (Engineering)
Normanby Road, Clayton North

See Melways Map 575 (475 in older editions) for locations within Monash University
Parking area adjoins West Ring Road

Plate motions and subducting slab morphology are intricately connected. Through the integration of seismicity, tomographic images, and relative plate motions the evolution of mantle structure can be interpreted. Tomographic images of P-wave, shear wave-speed, and bulk sound speed perturbations of the Northwest Pacific region have been interpreted to define the extent and geometry of the subducting Pacific plate in the upper mantle. The morphology of the subducted Pacific plate along the Kurile-Japan-Izu-Bonin-Mariana arc system was found to vary both in geometry and subduction angle along the entire length of the margin. To understand the differences and evolution of the slab morphology a tectonic reconstruction for the Western Pacific was created, which describes the geologic history of the past 20 million years. The palaeogeographic reconstruction illustrates the collision of the Japan and Kurile arcs, the opening of the Kurile Basin and Sea of Japan, change in motion of the Izu-Bonin arc, developing curvature of the Mariana arc, disparity in Pacific plate velocities along the convergent margin, and variation in rates of trench retreat along different segments of the arc system. The new plate motion model and interpretations of the physical properties of the mantle imaged with the P-wave and joint tomography are tools to assess the spatial and temporal evolution of the Pacific plate morphology from the mid-Miocene to the present and provide limitations in plausible plate motions for the region.

Heritage ... p2, GSAV student grants ... pp 3 & 4

Heritage Subcommittee update: Triassic Park

Visitors at the opening of Triassic Park. The Triassic outcrop is behind the people.

News from Triassic Park: the Bacchus Marsh Council Trench Reserve

By Roger Pierson
School of Life and Environmental Sciences
Deakin University (Burwood Campus)

While it is officially known as The Bacchus Marsh Council Trench Crown Land Reserve, the reserve's committee of management has decided that it should be known as Triassic Park.

In March 2004 a short article relating to the Council Trench was published in The Australian Geologist (Pierson 2004). The article documented the history of the Trench from the time of its nomination as a stone reserve in 1873 to the publication date. As Victoria's only known Triassic aged, sedimentary outcrop it remained reserved as a site of interest to those of geological persuasion for 127 years. In 1980 it was granted 'State' geological heritage status. Then in 2000 the reserve was offered for sale by the state government as a building development site. In 2003, after prolonged submissions and negotiations by the Heritage Subcommittee of the Geological Society of Australia (Victoria Division), the offer of sale was withdrawn and a committee of management for the newly created Crown Land Reserve was set up. In the same year the committee received a Crown Land Reserves Improvement Grant and used the funds to carry out fencing, access improvement and signage programs. The Council Trench Reserve was officially opened in October 2003.

What progress has been made at Triassic Park since early 2004? During that year, the committee produced a management plan for the reserve. The plan was launched at a well-attended public meeting in Bacchus Marsh, followed by a site visit. A Park Notes flyer for reserve visitors is in the final drafting stages. The committee currently has a Department of Sustainability and Environment (DSE) Stewardship in Action grant. These moneys are being utilised for several purposes. Following a geotechnical engineering assessment, a large, 9 tonne rock overhanging the Trench was deemed to be a hazard to visitors and it is to be pushed into the Trench. In addition, a large visitor interpretive sign is being designed that is to be placed near the reserve entrance gate. A walking path with indicators pointing to notable features within the reserve and also identifying the distant views to the south and west is being prepared. Work to improve the amenity of

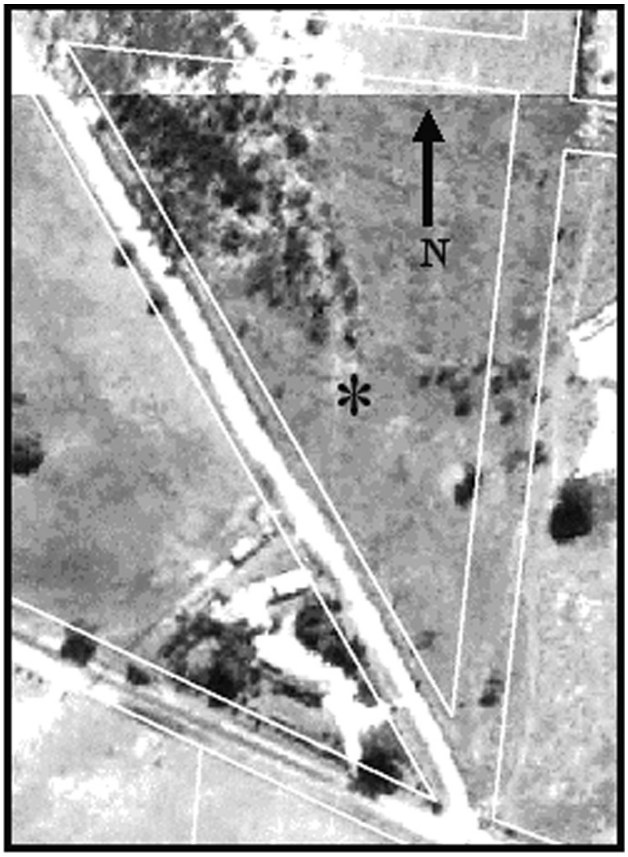
continued ...

the reserve is ongoing. Weed and rabbit control are issues that are unending. Regular committee working bees address the weed problem and annual rabbit eradication is carried out. Even though the reserve is small at only 2.1ha, total pest eradication is not an achievable goal. Fire prevention boundary slashing is an annual obligation. Fortunately, the reserve is relatively remote and unprepossessing, and to date has not suffered any damage from vandalism in any form

The committee is dedicated to working cooperatively with local groups such as Landcare, DSE, and the Bacchus Marsh and District Historical Society. Deakin University and Ecolinc, a Science and Technology Innovations Centre for secondary students at Bacchus Marsh, both have ongoing involvement at the reserve.

Those wishing to visit Triassic Park will find it on Tramway Lane, Bacchus Marsh (Melway Map 333 C 3).

REFERENCE:
Pierson, R. (2004): Victoria's only known Triassic aged sedimentary outcrop - the Bacchus Marsh Council Trench. *The Australian Geologist* **130**: 26-27.



Triassic Park Reserve: the Triassic outcrop is marked with an asterisk. Tramway Lane is to the west of the Reserve.

AUSTRALIAN EARTH SCIENCES CONVENTION
Resourcing the future

Sunday 2 July to Thursday 6 July 2006 at the Melbourne Convention Centre
www.earth2006.org.au

This will be the premier earth science convention for 2006, and will include presentations by leading Australian and international speakers. Registration $820; students $325.

The GSA (Victorian Division) is offering to reduce the AESC registration fee to $100 for its postgraduate and honours student members. This offer is limited to the first 50 Victorian honours students and the first 50 post-graduate students who apply prior to 13 April 2006. To take advantage of this offer, download and complete the application form from the following website: ***http://www.earthsci.unimelb.edu.au/basinstudies/aesc2006.html***

Send the form by fax or mail to Stephen Gallagher, along with cheque or credit card payment of $100, proof of full-time student status and GSA membership. If paying by cash please see Stephen Gallagher (University of Melbourne) or Adrian Pittari (Monash University).

Not a GSA member yet? Click on ***http://www.gsa.org.au/membership/join.html*** *to get a membership form. But remember that we need your applications for membership and support by 13 April.*

Dr Stephen Gallagher
Vice Chair, Geological Society of Australia (Victorian Division)
School of Earth Sciences, The University of Melbourne
Victoria 3010
☎ Ph: 8344 6513 ☎ Fax: 8344 7761
Email: sjgall@unimelb.edu.au

GSAV grants to student presenters

The Geological Society of Australia (Victoria Division) offers students who are members of the Division cash support to present oral or poster papers at interstate or international conferences, or similar meetings. The amount of the grant is usually $200 (interstate conferences) or $400 (international conferences). This support is subject to a small number of requirements and limitations including the following: the student must be enrolled in a full-time or part-time degree course at a Victorian University, must be a financial member of the GSA and registered with the Victorian Division, and must have had a presentation accepted by the conference.

Interested persons should look at the GSAV website for further details and an application form. The address is **http://www.vic.gsa.org.au/StudentGrants/GSAVStudentGrant.pdf**

Grant recipients may be asked to either present a talk or submit an article to the GSAV within a year of the conference. This month's guest speaker, Meghan Miller, was the recipient of a GSAV conference support grant that assisted her to attend the major American Geophysical Union Fall Meeting in San Francisco in December 2005.. An abstract of her paper, "Four dimensional evolution of the Western Pacific convergent margin, based on seismic tomography and palaeogeographic reconstructions", *appears on page 1 of this newsletter. Two other grant recipients, Ivo Vos and Angela Bush, have submitted the following articles.*

REPORT FROM SGA MEETING IN BEIJING, CHINA:
"Mineral Deposit Research: meeting the global challenge"

Ivo Vos
School of Geosciences, Monash University

In August 2005, I was fortunate enough to receive a student conference grant from the GSAV that allowed me to attend the SGA meeting "Mineral Deposit Research: meeting the global challenge" in Beijing, China.

I gave two presentations at this conference. The first was entitled ***Geodynamic controls on giant metallogenic provinces: insights from gold provinces in southeast Australia*** co-authored with Frank Bierlein (SOG Monash Uni) and Paul Heithersay (PIRSA).

Abstract: The geodynamic processes that control large-scale accumulations of ore are poorly understood. It has commonly been suggested that massive ore deposits are generated through a combination of factors in the Earth's system. In the Lachlan Fold Belt of southeastern Australia, world-class orogenic gold and porphyry gold-copper deposits formed simultaneously at ~440 Ma in distinct tectonic settings. The driving mechanism that controlled the extraordinary temporal coincidence of these deposits remains largely unexplained. We propose that the interplay of a mega-subduction system and mantle processes could explain the generation of the giant ~440 Ma gold deposits and related metallogenic, tectonic, magmatic and sedimentary events elsewhere in Australia (see Figure 1 on opposite page).

The second presentation, co-authored with Frank Bierlein, provided a synthesis on my PhD research in northeastern Queensland and was entitled ***Gold systems in northeastern Queensland: a key to tectonic evolution of the northern Tasman Fold Belt System, Australia***.

Abstract: The nature and style of ore deposits can provide important constraints on the overall tectonic framework of orogenic systems. Characteristics of epigenetic gold-antimony systems in the northern part of the Tasman Fold Belt System in Australia are investigated. We report on sulphide paragenesis, structural relationships and fluid inclusion studies of gold-antimony deposits in the Hodgkinson and Broken River provinces. Strong similarities between the deposits in both provinces allows for inter-regional correlation, which provides important insights into the tectonic evolution of the northern portion of the Tasman Fold Belt System. The 'orogenic' style of gold mineralisation and relative timing of gold deposition in both provinces

continued ...

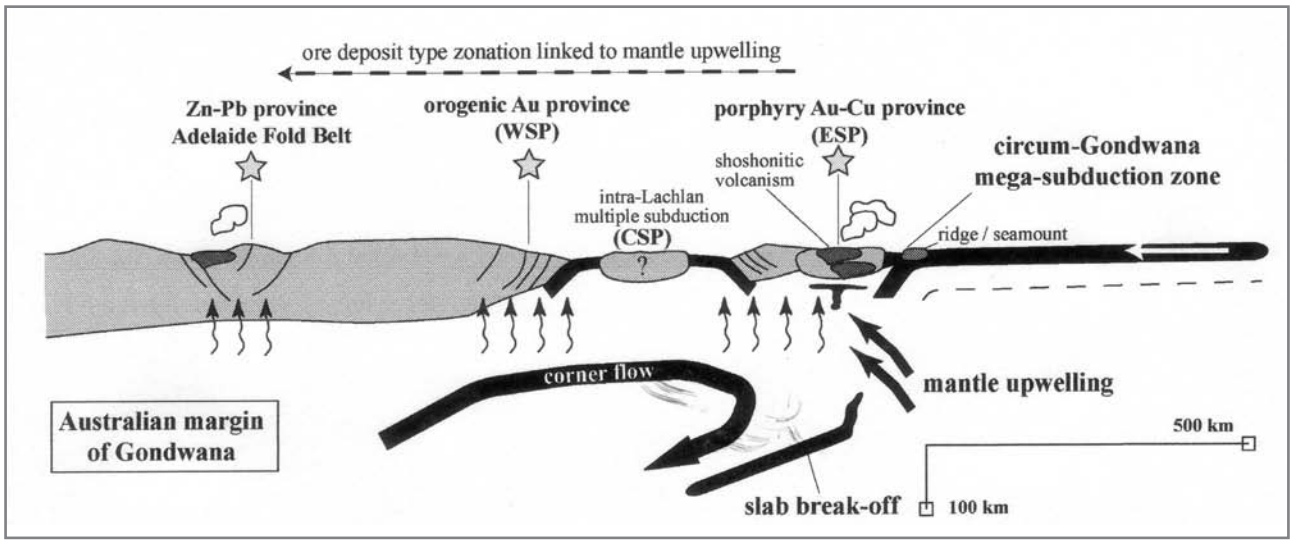


Figure 1: Interplay of mega-subduction zone system and mantle processes driving the generation of major ore deposits (including orogenic gold deposits in the western Lachlan Fold Belt.

imply that gold mineralisation was formed during several episodes of deformation in a subduction-accretion system subduction along Pacific margin of Palaeozoic Australia.

For more information, please feel free to contact me or keep an eye on forthcoming issues (later this year) of Mineralium Deposita and Ore Geology Reviews. Thanks for your support GSAV and keep up the good work!

Angela Bush attended the International Association of Hydrogeologists meeting in Auckland, NZ, in December 2005: "Where Waters Meet". This conference was also supported by the NZ Society of Soil Science and the NZ Hydrogeological Society.

RECHARGE-DISCHARGE BEHAVIOUR FOR THE DILWYN FORMATION AQUIFER OTWAY BASIN, VICTORIA AND SOUTH AUSTRALIA

A L Bush, C R Lawrence and T R Weaver
School of Earth Sciences, University of Melbourne, Victoria 3010

The Otway Basin is a coastal basin with marine and continental sediments of Upper Cretaceous to Recent age. Bore logs of the region have been compiled into a 3D hydrostratigraphic model containing four aquifers interspersed with marl and mudstone aquitards. One of the aquifers, the Dilwyn Formation (up to 900 m thick), comprises carbonaceous and quartz-rich sands interbedded with clay, silt and minor gravel. Although shallower aquifers are used substantially for rural and stock supplies, the Dilwyn Formation aquifer, which lies at a depth of up to 1500 m near the coast, is used for town supply due to its low salinity (EC of 100-1200 µS/cm).

Downward gradients indicate that contemporary regional recharge mainly occurs at the margin of the basin where the Dilwyn Formation onlaps older rocks, the lower-permeability basement rocks of the Otway Ranges. Runoff from the Ranges enhances the current regional recharge to the Dilwyn Formation. Previous authors have shown that groundwater near the coast was recharged more than 10,000 years ago during a cooler climate, with little evaporation. This, in part, accounts for the good quality groundwater currently extracted at the coast. However, localised recharge towards the Dilwyn Formation (and upward discharge from it) occurs through the confining marl, assisted by faulting, and complicating the flow regime.

Previous workers have deduced that regional discharge from the Dilwyn Formation occurs at the coast or offshore, due to the hydraulic gradients towards this direction. From detailed submarine topography and

continued ...

seismic interpretation it is evident that deep-cutting submarine canyons (situated on the continental slope 30-50 km offshore) incise the basin sediments and may facilitate the diffusion of terrestrial groundwater into the ocean. This study seeks evidence of offshore discharge via sea temperature and salinity anomalies, and the use of environmental tracers.

The sub-surface interface between the Dilwyn's fresh groundwater and saline marine water slopes towards the continent and accounts for the high salinity of the groundwater underlying the Dilwyn Formation. The interface is in a period of adjustment from an old hydraulic equilibrium to a new one, created by drawdown of hydraulic head onshore in the last 50 years and a relatively static sea level. Analytical solutions are being used to map the position and movement of the interface. Given the position of the interface controls saline intrusion and the likelihood of elevated demand on groundwater resources (expected to grow over the next ten years by 50%), understanding the interface will be increasingly important for the future of this water resource.

Delegates at the Conference Dinner:

Back Row:
Sarah Tweed (Monash University), Suse Hayes (SKM Melbourne), Andrea Todd (Kingett Mitchell Ltd, NZ)

Front Row:
Angela Bush (University of Melbourne, GSAV grant recipient), Rose Reid (SKM Melbourne)

Copy deadline
for the next *Victorian Geologist*
is Friday 7 April 2006

Welcome to new members ...

Transferring from Student Member to Member:	Carl Layden Briony Muller
Transferring from Member to Retired Member:	David Barr
New Memberships approved:	Vladimir Lisitsin Alistair Ritchie Emily House
Transferring from Student Member to Graduate Member:	Jill Middleton Ivo Vos
Transferring from Retired Member to Member:	Terry Taylor

For up-to-date GSAV news go to www.vic.gsa.org.au

Dates for your diary

AESC 2006: Early bird still singing

When: Sunday 2 July to Thursday 6 2006
Where: Melbourne Convention Centre
Details: www.earth2006.org.au

Early bird registration rates are now available until 31 March 2006. Members of GSA and ASEG along with Speakers can still register at this discounted rate.

Joint AusIMM/AIG talk: Discovery of the Yandal Gold Province, WA: role of geoscience

Speaker: Neil Phillips, exploration consultant
When: 6 p.m. Tuesday 28 March 2006
Where: The Naval and Military Club, Monash Room, 27 Little Collins Street. Ample car parking opposite. Please note dress requirements (no jeans allowed). Members, guests and visitors welcome.

Discovery of the Yandal gold province during the 1990s demonstrates the potential for new discoveries even in well-trod parts of Australia. The Yandal story also illustrates the important role geoscience plays in motivating and guiding successful exploration programs.

The presentation will highlight the key aspects of the various exploration programs at Yandal. One key difference over other exploration success stories is that much of the geological and mining data was shared and recorded in the public domain. This helped to establish a strong relationship between exploration and researchers. Geoscience research also played a significant role in identifying the mineral potential of the Yandal area, in dictating optimal ways to explore including the use of recently-discovered regolith methods, and in better mining practices. Much of the geoscience input was through a series of tightly-focussed campaigns involving staff from the exploration team, the mining operations and universities.

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The theme “Reunite Gondwana - Realize the Potential” highlights a blending of technical and commercial approaches, and the extensive technical program would interest many GSA members. See the conference website for details. Preliminary short course topics include Coalbed Methane, Exploration Geochemistry, Fault Analysis, Structural Interpretation, Reservoir Prediction and a Core Workshop. Preliminary field trips will be held throughout Australia as well as to locations in Borneo, South Africa and New Zealand.

“We were meant to be here ...”

A conference to pay tribute to the work of Paul Davies is to be convened on 20-21 June 2006 at the Australian Academy of Science in Canberra: “From Stars to Brains: pathways to consciousness in the natural world”. Contact details: Manning Clark House, PO Box 3096 Manuka ACT 2603; phone 02 6295 9433; email manningclark@ozemail.com.au; website http://www.manningclark.org.au. Final program and registration forms to be issued soon. The preliminary program suggests that this meeting will provide a great deal of food for thought!

THE VICTORIAN GEOLOGIST

April 2006

THE GEOLOGICAL SOCIETY OF AUSTRALIA
Victoria Division

Next General Meeting and AGM: Thursday 27 April

The plate tectonic and stratigraphic evolution of southeast Australia, New Zealand and Antarctica: Implications for petroleum systems

M.S. Norvick

6.15 p.m. at the University of Melbourne
Fritz Loewe Theatre, Earth Sciences Building, cnr Swanston & Elgin Sts.

Preceded at 5.30 p.m. by drinks and nibbles in the tea-room, 4th floor. $2/person.

Southern Australian and New Zealand breakup history is divisible into three phases. The first phase began with Callovian extension in the western Bight Basin. During the Tithonian, rifting extended eastwards into the Duntroon, Otway and Gippsland Basins. By the Valanginian, ocean crust formed between India and western Australia. Structural style in the western Bight changed to thermal subsidence. However, fluvio-lacustrine rift sedimentation continued in Duntroon, Otway and Gippsland until the Barremian when these basins also changed to thermal subsidence. During the early Barremian, massive amounts of dacitic volcanoclastic debris began to flood the Bass Strait basins and indeed much of eastern Australia from volcanic centres in the Lord Howe Rise region. This style of volcanogenic fluvial sedimentation continued through the Aptian and Albian.

The second phase began during the Cenomanian with uplift in eastern Australia, stress reorganisation and divergence of basin development. The Otway, Sorell and Great South Basins, and possibly also other basins under the Ross Sea, deepwater Taranaki and Lord Howe Rise, formed in a transtensional regime, arranged in an X-shaped complex of rifts. During the Santonian, oceanic spreading began in the southern Tasman Sea (c.83 Ma), and between the Campbell Plateau and Antarctica. Slow extension caused thinning of continental crust in the Bight and Otway Basins and subsidence into deeper water. Ocean crust formed south of the Bight Basin in the Early Campanian (c.80 Ma) and also started extending up the eastern Australian coast.

continued ...

The third stage in development was caused by end-Paleocene (55 Ma) cessation of Tasman Sea spreading, Middle Eocene (43 Ma) changes to fast Southern Ocean spreading, and end-Eocene (35 Ma) final separation between the South Tasman Rise and Antarctica. These events caused collapse of continental margins and widespread marine transgression. Breakthrough of ocean crust between Australia and Antarctica was followed by propagation of spreading into the Emerald Basin and ultimately by development of the transpressional margin through New Zealand.

Plate tectonic reconstructions of the 16 or more continental pieces making up SE Australasia allow us to predict stratigraphy and petroleum systems in deepwater areas where there has been little exploration. The gas-bearing Otway-Gippsland Lower Cretaceous rift complex appears to extend to the Lord Howe Rise but not as far as New Zealand. Mid-Cretaceous rift basins, similar to the Emperor Group in Gippsland and Shipwreck Group in Otway, occur on the Campbell Plateau and deep beneath the shallow water Taranaki and East Coast North Island Basins. So far, the only member of this group with a proven source system is the Great South Basin, but other possible Mid-Cretaceous rift-related petroleum systems may be present on the Lord Howe Rise and deepwater Taranaki. The prolific Late Cretaceous-Palaeogene petroleum source systems in Gippsland and shallow water Taranaki were deposited on separate continents and are therefore only related climatically.

Heritage and History News

The Australian Earth Science Convention: Heritage & history papers and field trips

by Bernie Joyce
Member and former Convener of the Geological Heritage Subcommittee

Heritage and history will come together when the Australian Earth Sciences Convention (AESC) meets in Melbourne in July 2006. On Monday 3rd July six geological heritage papers will be presented, followed by four history of geology papers. The presentations are being organised by Susan White (Convener of the GSA's Standing Committee for Geological Heritage), and Bernie Joyce (Chair of the GSA's Earth Sciences History Group). Business meetings of both groups will be held, to discuss activities since the previous convention in Hobart in February 2004 and to plan for the future.

Two excursions are also planned. Susan White is offering *Geological Heritage in the Melbourne Suburbs* on Friday 7th July (Field Trip F7). This is a one-day trip looking at a number of Melbourne suburban coastal sites that show the full range of geological heritage values from local to internationally significant. These sites, extending from St Kilda to Beaumaris and Mentone, also expose the geological history of the Melbourne area. Some are classic teaching sites but others are less well known. For more information on this and the field trip described below, see http://www.earth2006.org.au/workshops.shtml#self.

On Sunday 2nd July Bernie Joyce and Doug McCann are offering *History, heritage and urban geology of the inner city of Melbourne and its northern suburbs* (Field Trip F6). Royal Park, just north of the city of Melbourne, is an ideal area to demonstrate the geology of inner Melbourne. The famous Royal Park railway cuttings, dating from 1882, are important in the history of local geology. During the 19th century many school and university students, as well as field naturalists and others, made collecting visits to the area with such geologists as T. S. Hall and G. B. Pritchard. The story is well outlined by Tom Darragh, geologist and historian of geology, in his presentation of Pritchard's "Geology of Royal Park" (Darragh 1974).

The two railway cuttings are also sites of geological significance (see ML 42 and ML 69 in Mitchell *et al.* 2000), and they appear as one of the heritage case studies on the GSA Victoria Division's web site (www.vic.gsa.org.au/Heritage), as an example of successful liaison by the Subcommittee for Geological Heritage to keep the site of the southern cutting ML 69 available for geological access and study.

Pritchard's map in Darragh (1974) shows a quarry near the southern railway cutting, and on the field trip Doug McCann will discuss how fossiliferous Tertiary iron-rich sandstone from this quarry may have been used for the construction in 1839 of St James Old Cathedral, now in King St.

The sites have continued to be used for teaching for over 120 years, and are described by John Webb in the Victorian Geology Excursion Guide (Webb 1988). In this 21st century excursion Bernie Joyce will show how rock type, structure, tectonics and volcanism, as well as sea level change, determined the landscape at the time of first contact in 1834. Questions to be considered include: How did this landscape, and its drainage, soils and vegetation, affect the lives of the aboriginal inhabitants of the area? And how did these same factors determine where Melbourne was sited and how it grew? This excursion has grown out of a continuing project (Joyce 2005). In this half-day field trip by tram and train (also a rather historical approach!) and during a pleasant 2 km park walk, participants will view and discuss the geology of inner Melbourne, from the now vanished basalt falls at Queens Street which determined the siting of the city, to the setting aside of Royal Park by Governor LaTrobe, and its subsequent eating-away in Parkville by developers and governments. As a conclusion we will consider the siting of the 2006 Games Village and its new Wetlands, on the river terraces above CityLink and the concrete drain of Moonee Ponds Creek.

References

Darragh, T.A., 1974 (ed). Geology of Royal Park by G.B. Pritchard. Victorian Naturalist 91(8): 223-235.

Joyce, Bernie, 2005. Back to the pre-European Landscape: an Exercise in Reverse Mapping for Inner Melbourne. Programme and Abstracts, Australian Map Circle, 33rd Annual Conference, The University of Melbourne, 6-9 February 2005:10. (reprinted in Earth Science History Group Newsletter No. 35, April 2005, p.21.)

Mitchell, M. M., Cochrane, R. M. & King, R. L. 2000, Sites of geological significance in the MELBOURNE 1:250 000 mapsheet area, Geological Survey of Victoria Technical Record 2000/1, pp.9-10.

Webb, John, 1988. Studley Park and Royal Park, Chapter 14-1, in Clark, I. and Cook, B. (eds) Victorian Geology Excursion Guide, Australian Academy of Science, Canberra, pp.373-386.

1931 geologically coloured plaster relief model of the Royal Park area, prepared for teaching use in the Department of Geology at The University of Melbourne (photo E. B. Joyce for the departmental archives).

Award-winning efforts

Congratulations to Malcolm Wallace (University of Melbourne) as the 2005 recipient of the Stillwell Award (medal) for the best paper published in the Australian Journal of Earth Sciences: M W Wallace, J A Dickinson, D H Moore & M Sandiford: Late Neogene strandlines of southern Victoria: a unique record of eustasy and tectonics in southeast Australia.

Congratulations also to Professor Roger Powell (University of Melbourne) on his election as a Fellow of the Australian Academy of Science. Roger Powell is a world leader in the application of thermodynamics to predicting mineral assemblages and phase relationships in natural rocks. He has pioneered the development of quantitative approaches to the study of metamorphism and rigorously understanding the physical conditions under which metamorphic reactions occur.

Dates for your diary

16th Annual VM Goldschmidt Conference: "Geochemistry Downunder"

When: 27 August to 1 September 2006
Where: Melbourne Exhibition and Convention Centre
Registration: on-line at www.goldschmidt2006.org or contact conference managers
Early bird fee: for registration by 30 June 2006
Details: Conference Managers: phone (02) 9265 0700 or email goldschmidt2006@tourhosts.com.au

Co-sponsored by the GSA, the 16th Annual V.M. Goldschmidt conference in 2006 is being hosted for the first time in the southern hemisphere. Australia's unique, plate-scale natural laboratory will form the backdrop for the presentation of new ideas on a diverse range of geochemical topics (everything from advances in geochemical techniques to formation of the solar system, evolution of the lithosphere, orebodies, surface processes, subduction processes, mantle convection, tectonic processes, aqueous and ocean geochemisty, climate and environment). Check out the excellent website for the comprehensive scientific program, the long list of Australian and international keynote speakers, and field trips to iconic geologic sites at Mt Isa, the Great Barrier Reef, Lachlan Fold Belt, Taupo volcanic zone (NZ), western Victoria, New Caledonia, Broken Hill, and the Pilbara. This conference promises to be a landmark event.

Australian Earth Sciences Convention 2006: anyone not yet registered?

When: Sunday 2 July to Thursday 6 July 2006
Where: Melbourne Convention Centre
Details: 9417 0888 or www.earth2006.org.au

Call for nominations for the 2006 Selwyn Medal

The Selwyn Medal is named in honour of Sir Alfred Selwyn, an eminent Victorian pioneering geologist and founder of the Geological Survey of Victoria. It is awarded, usually yearly, to recognise significant ongoing or former contributions of high calibre to any field of Victorian geology. A candidate for this medal should have made a major contribution to new knowledge of the geology of Victoria, or a significant reinterpretation of it based on critical observations, or have contributed importantly to a major mineral or oil discovery, or have produced important geological publications or have been involved successfully in the development of the geological profession.

Two or more members of the Society can nominate a member for the award by submitting to the Awards Committee the name of the candidate, biographical data, and a citation in about 300 words describing the candidate's work and its significance to the geology of Victoria.

Welcome to new members ...

Member: Gavin Scherer

Student members: Laura Gow, Alexander Farrar, Megan Weatherman, Patricia Durance-Sie, Miss Brett Lynsey, Bronwyn Kearney, Fernanda Luft, Wendy Mason, Benjamin McCormack, Jeremy Mitchell, Lianora Taralrud-Bay, Lucy Porritt, Robert Duncan, Erin Matchan, Kim Ely, Mark Quigley, May Sze Estee Woon, Sarah Hagerty, Kate Bassano, Steven Spencer, John Miranda, Steven Sewell, Matthias Raiber

Transfer from Student to Member: Ben Williams

Transfer from Student to Graduate Member: Adrian Pittari

Visit the GSAV on www.vic.gsa.org.au or the GSA on www.gsa.org.au

Closing date for material for the next Victorian Geologist is Friday 5 May

Nominations for GSAV Committee and Subcommittee members

The April general meeting will be preceded by the formal AGM, and **nominations are welcomed** for any or all positions on the main committee or subcommittees (including education, publications, publicity, heritage, membership, newsletter, awards ...) Your photograph could be added to http://www.vic.gsa.org.au/committee.htm but more importantly **you could be making a difference** to your society and profession.

We are particularly keen to attract a new publicity guru, with ideas on how to build our membership back past the 400 mark. The AESC has led to a rise in membership this year – how do we build on that and keep it going? However, all of the activities of the Division would welcome the input of new ideas. If you are uncertain about what you can do, talk to our chair, David Moore - even if you are after the chair yourself!

I ……..……..….

nominate ……..

for the position of ……..……..

on the Geological Society of Australia, Victoria Division committee for the 2006/7 year.

I …….

second the nomination.

I agree to the nomination. …….

GSA (VICTORIA DIVISION) COMMITTEE

Please address all correspondence to the GSA Victoria Division
GPO Box 2355V, Melbourne, Vic., 3001
Internet address: www.vic.gsa.org.au

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Vice-chair:	Stephen Gallagher	8344 6513 (BH)
Secretary:	Peter Pritchard	9439 9582
Treasurer:	Lindsay Thomas	0427 354 828

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Bicentennial Gold:	Gerhard Krummei	9820 2595
Education:	Noel Schleiger	9435 8408
Heritage:	Sue White	9328 4154
Membership:	Leisa Brough	9727 4898 (AH)
Newsletter:	Marilyn Moore	9844 1072
Program:	*vacant*	
Publications:	*vacant*	
Publicity	Stephen Gallagher	8344 6513 (BH)
Webmaster:	Jodie Miller	

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GeoViSIO Rep:	Rob Duncan	9905 1127 (BH)

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Geof Fethers	8420 6280 (BH)
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Sue White	9328 4154

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THE VICTORIAN GEOLOGIST

May 2006

THE GEOLOGICAL SOCIETY OF AUSTRALIA
Victoria Division

Next General Meeting: Thursday 25 May

Carlin gold province: deep weathering and opportunities in northern Victoria

Neil Phillips

6.15 p.m. at the University of Melbourne
Fritz Loewe Theatre, Earth Sciences Building, cnr Swanston & Elgin Sts.

Preceded at 5.30 p.m. by drinks and nibbles in the tea-room, 4th floor. $2/person.

The analogy between the Victorian and Carlin (Nevada, USA) gold provinces has been recognised since 1997 and provides considerable optimism for exploration in north-central Victoria. The Carlin province has been one of the major sources of world gold since its development in the 1970s. It includes four deposits exceeding 10 Moz, has produced 50 Moz in the last three decades, and appears to have many years of remaining life.

New scientific ideas on the nature and origin of the Carlin deposits have global application, can be used to enhance the prospectivity of analogous terrains, and, in turn, raise exploration investment in places like northern Victoria. One such new idea is that of weathering to 200-500m depth at many Carlin deposits. In drill core, this bleached material of kaolinite and Fe-oxides continues to 800m and possibly 1500m depth. Furthermore, the bleached material is only the upper part of the regolith profile; the nature of the saprolitic part of the Carlin regolith profile has hardly been addressed.

Weathering in north-central Victoria is not as deep as in Nevada, but a similar oxide zone of kaolinite and Fe-oxides is present, and this gave rise to the erroneous interpretation of these deposits as *epithermal,* when in fact they are *weathered* gold deposits. The saprolite zone in Victorian deposits is commonly black and contains refractory gold, and although the black material is not oxidised, importantly some is still weathered. It is only well below the bleached-to-black transition that unweathered rock and primary gold mineralisation are reached. Translation of the Carlin findings has helped considerably in understanding existing Victorian deposits, such as Fosterville, and recognising its depth potential. It also assists exploration under cover of the Murray Basin and at depth near former open pit resources. Translation of the Carlin ideas to Victoria has important implications for the distribution of refractory gold, quartz veining including both its presence and absence, and ore continuity and grade variation with depth. Regolith science will be critical in unlocking the full potential here; and research to understand primary gold formation must make allowance for the weathering overprint.

Phillips, G N, 2005. Deep weathering around gold deposits of the Carlin Gold Province.
Geological Society of Nevada: *Window to the World,* 93-111.

VICTORIA DIVISION

CHAIRMAN'S REPORT FOR 2005-2006

GSAV Annual General Meeting Thursday 27 April 2006

The 2005-2006 year has been a busy but difficult year for the Division. Dominating the year has been the tremendous amount of work done by many in setting up the Australian Earth Science Convention with the Australian Society of Exploration Geophysicists. This is now just 2 months away, and judging from the program, promises to be a great success. Unfortunately what it has meant is that many of the people that the Division could normally expect to help have been working very hard to ensure this success. Others have been working at capacity because of the current minerals boom and the consequent shortage of geologists. Again, whilst it is great news for our members and the profession generally, there are downsides.

Despite this, there have been some significant advances. Perhaps the most heartening of these is the advance in membership numbers over the last few months. Since the start of the year we have had 37 new members, which means that the branch has expanded to almost 280, or up by at least 10% over the final 2005 figure. Some 27 of these are students who have taken up membership because of the reduced rates the Division has offered for the Australian Earth Science Convention. We have a unique opportunity to engage these people and to capture their imaginations. This is a task for all of us, not just the committee and I urge all members to support these new faces. If you see unfamiliar faces at the monthly meetings, please welcome them and make them feel at home. Not all of these people will stay with the Division; many will move elsewhere when they have finished their studies. However if they leave Victoria feeling the GSA is a relevant part of their professional life, then we will have made a big contribution both to the GSA and to the people concerned.

We have also been keen to sponsor students in other ways. The Division continues to co-sponsor the Victorian Universities Earth & Environmental Conference. As well, the Division supported 10 students on a field trip to South Australia, which included a visit to the Olympic Dam mine. This year, we have agreed to help fund another group to Western Australia.

Another initiative we have persisted with has been to continue meetings at Monash University. We have done this to try to serve our members there; members close to the city have long been well served but those in the eastern suburbs have been less well looked after. The Monash venue has not been a great success, as numbers have rarely exceeded 20 and our city-based members have been disadvantaged. While we have scheduled meetings there in July and October, if numbers continue to be poor it will be hard to justify scheduling further routine monthly meetings there.

The third edition of 'The Geology of Victoria' has proved to be a continuing success. Of the 1200 copies printed, we have just 539 left, having sold about 60 in the past year. It indicates the excellent job done by all concerned and in particular that by the editor, Bill Birch. Encouraged by this, we have started a complete rewrite of 'Introducing Victorian Geology'. Susan White, our Heritage Subcommittee Chair, committee member and drinks and nibbles supervisor at the University of Melbourne will guide the project. The project is well underway, with chapter outlines and authors settled and writing underway.

Another example of Susan's dedication to the GSA has been the Heritage Subcommittee's role in the successful appeal to the Victorian Civil and Administrative Appeals Tribunal over an inappropriate housing development at Tower Hill. While this is more fully reported on in her Subcommittee Report, it is appropriate to note the excellent work the group has done to preserve one of Victoria's most accessible and significant geological treasures. It is rare for us to take such extreme measures as negotiation has solved most problems.

The Selwyn Symposium was another real success. The theme, 'Cashing in on the minerals boom', seemed to strike the note of the times and so attendance of about 100 was well up on the previous year. At the end of the day, Tony Crawford was presented with the Selwyn Medal for his work on some of the oldest exposed parts of the state, the Cambrian mafic volcanic rocks of the Heathcote Volcanic Group and acid volcanic rocks of central and western Victoria. The Canavan prize, to a third year student who has achieved the highest marks for first and second year, was awarded to Sarah Hagerty of LaTrobe University.

continued ...

Because of the very crowded second half of the year, with the Australian Earth Science Convention and the Goldschmidt Conference in late August and early September, we will not be having an all day Selwyn Symposium but we will be having a Selwyn Lecture at night on 28 September.

During the year Andy Wilde, our industrious program coordinator resigned from the committee because of work pressures. As well, Leisa Brough, our membership person, will not offer herself for re-election as family life beckons. The year also saw the death of Neil Archbold, another long time supporter of the GSA, most recently as a member of the Awards Subcommittee. We will miss them all.

Finally I have decided to step down as Chair. If nobody else nominates, it will give someone younger, Stephen Gallagher, a chance. I believe that the future of the Division lies in its younger members and we can best exploit this by having a younger Chairman. I have offered to remain as secretary.

David Moore
27 April 2006

Dates for your diary

"We were meant to be here ..."
From starts to brains: pathways to consciousness in the natural world

When: 20-21 June 2006
Where: Australian Academy of Science, Canberra
Details: manningclark@ozemail.com.au or phone 02 6295 9433

This multidisciplinary conference is convened to pay tribute to the work of Paul Davies, whose books and articles explore pathways from the big bang, subatomic particles, atoms and molecules, the origin of life and intelligence to realms of human consciousness and philosophical and spiritual dimensions. Speakers include Paul Davies, Phillip Adams and many more.

The 2006 A.W. Howitt Lecture: Dr Larry Harrington
The Zealandia Orogen: a new unit in the Tasman Orogenic System

When: Thursday 29 June 2006 at 8.00 p.m.
Where: Royal Society of Victoria
Details: ***Bookings essential –*** see forthcoming flyer and June edition of *The Victorian Geologist.*

16th Annual VM Goldschmidt Conference: "Geochemistry Downunder"

When: 27 August to 1 September 2006
Where: Melbourne Exhibition and Convention Centre
Registration: on-line at www.goldschmidt2006.org or contact conference managers
Early bird fee: for registration by 30 June 2006
Details: Conference Managers: phone (02) 9265 0700 or email goldschmidt2006@tourhosts.com.au

This conference promises to be a landmark event. See the April edition of *The Victorian Geologist* for details.

Australian Earth Sciences Convention 2006: anyone not yet registered?
Sunday 2 July to Thursday 6 July 2006 – phone 9417 0888 or look up www.earth2006.org.au

Welcome to new members ...

Member: Trent Triantafillow, Rebecca Farrington, Christopher Davis

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Newsletter deadline

First Friday of the month except Dec & Jan
moore.me@bigpond.net.au

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THE VICTORIAN GEOLOGIST

June 2006

THE GEOLOGICAL SOCIETY OF AUSTRALIA
Victoria Division

Next General Meeting: Thursday 29 June at 8 p.m.

JOINT MEETING OF
THE ROYAL SOCIETY OF VICTORIA
and
THE GEOLOGICAL SOCIETY OF AUSTRALIA VICTORIA DIVISION

A. W. HOWITT LECTURE

The Zealandia Orogen: a new unit in the Tasman Orogenic System

by

Dr H J Harrington *FRSV FGeolSocAust*
Former Member of The Bureau of Mineral Resources, Geology and Geophysics

The Royal Society of Victoria Hall, 9 Victoria Street, Melbourne

Cost: $15.00 (including refreshments afterwards)
Bookings are essential – *see booking slip on page 7*
RSVP: Tuesday 27th June

When the Tasman Sea opened from 83 Ma (Late Cretaceous) it removed from Australia a large section of the Tasman Orogenic System that now forms a subcontinent, which has been named Zealandia in several publications. It consists of Lord Howe Rise, Norfolk Ridge, New Caledonia, New Zealand, Campbell Plateau and Chatham Rise.

The western part of the subcontinent consists of the Tuhua Orogen, which was formerly attached to Australia and is related closely to the Lachlan Orogen in Victoria. The larger eastern part consists of a newly recognised unit, for which the name Zealandia Orogen is suggested. The Tuhua and Zealandia orogens will be discussed. The line on which they meet is thought to be a Late Carboniferous continental truncation zone. Parts of the Zealandia Orogen and the truncation zone are well-exposed in Australia for 400 km northwards from Brisbane.

VICTORIA DIVISION

AUDITOR'S REPORT FOR 2005-2006

from the
GSAV Annual General Meeting Thursday 27 April 2006

The accounts of the Geological Society of Australia (Victoria Division) for the financial year ending 31 December 2005 have been audited by Larkin Partners, Chartered Accountants, of 17 Cotham Road Kew. The auditor's report is presented in full as a separate download with this newsletter.

Heritage & History News

What is Victorian Geological Heritage all about ?

Susan White
Convenor GSA (Vic) Heritage Subcommittee

Geological Feature Data Sheets 1 (opposite) and 2 (on page 4) illustrate the way geological features in Victoria are classified. The classification has been undertaken on a volunteer basis by members of the GSAV Heritage Subcommittee over a period of years; over 2000 sites are presently listed on the database with many more yet to be included. Entries are linked to maps and bibliographic databases; eventually, it is hoped, they will be linked to photographs.

Over the past year the Victoria Division of GSA has been involved in a number of issues related to the management of sites. Some of these have been on private land but others have been on public land. The most high profile case was the VCAT case involving inappropriate building too close to the crater rim at Tower Hill, previously described in the Victorian Geologist and TAG. The success of these cases is to a large extent built on the methodical documentation work on geological heritage that the subcommittee has been doing for over 20 years. This started with keeping records of important sites and working out a system of assigning significance and what involves a significant site. It has now progressed to maintaining a database of sites and a robust repeatable procedure for assigning significance. The assigning or reviewing geological significance is undertaken in Victoria by the GSA (Victoria Division), Heritage Subcommittee. No government department is involved directly in the assigning of significance, although the subcommittee works closely with the geologists from the Geological Survey of Victoria as well as other interested groups.

Geological heritage sites are places that enable us to understand the composition of the earth, the internal and external processes that have shaped it and the evolving flora and fauna that occupied it. Many localities display geological and landform features of interest for educational, research or conservation purposes. Geological sites display features developed over geological time, such as an outcrop with sediments or fossils. However, many geomorphological sites are important for displaying active land forming processes, such as dune development or stream erosion and deposition. Some sites show rare or unusual minerals, fossils or landforms. Sites are rated according to a defined scale of significance. The size and nature of such features varies widely and includes natural outcrops, exposures in road and railway cuttings, quarries or other excavated sites and important landforms.

Three overlapping concepts – outstanding, rare and representative – are used when selecting sites and assessing their level of significance. Significance is often ascribed to features because they are outstanding or rare in some way. However, recognition of only outstanding or rare sites is insufficient to identify all significant elements of the geological landscape and recognition of representative places complements and balances such perception. Representative sites are examples of features typical of a region; outstanding sites are excellent examples of a feature, either in the region or on a wider scale; and rarity is based on the degree of replication of a feature, the extreme case being a feature that is unique. A geographic scale enables comparison of the significance of sites, for example, is the site of local, regional, state, national or international significance. These ratings may be used in combination; for example, a representative feature

continued on page 4 ...

Geological Feature Data Sheet

SHEET 1

REFERENCE NUMBER **PR 012**

FEATURE NAME Tower Hill

LOCATION Koroit

1:250 000 MAP PORTLAND SJ 54-11 1:100 000 MAP Warrnambool 7321

MUNICIPALITY Moyne

LAND STATUS ☒ freehold/private ☒ crown/public

LAND USE ☒ Agriculture ☐ Mining ☒ Other reserve ☐ Utilities and Services ☐ Forestry ☐ National Park ☐ Residential ☐ Other

AMG 54 187 575 RESTRICTED ACCESS ○ Yes ◉ No

POSITION VERIFIED ◉ Yes ○ No

SIZE ○ small <100m/1ha ○ medium 100-500m/1-25ha ◉ large >500m/25 ha

PHYSICAL TYPE ☒ outcrop/natural section ☒ quarry/pit/open cut ☒ landscape ☐ road/railway cutting ☐ underground mine/shaft/tunnel ☐ coastal ☒ viewpoint ☒ landform ☐ cave

GEOLOGICAL TYPE ☒ stratigraphy (including type section) ☐ petrology ☐ mineralogy (including gem) ☐ palaeontology (including type locality) ☐ weathering/soil profile ☒ process ☐ structure ☐ relationship ☒ palaeoenvironment ☒ landform ☐ historical ☒ classical ☐ sedimentary ☐ metamorphic ☐ intrusive ☒ volcanic ☐ archaeological

AGE ☐ Cambrian ☐ Ordovician ☐ Silurian ☐ Devonian ☐ Carboniferous ☐ Permian ☐ Triassic ☐ Jurassic ☐ Cretaceous ☐ Paleocene ☐ Eocene ☐ Oligocene ☐ Miocene ☐ Pliocene ☒ Pleistocene ☒ Recent/Holocene

USE ☒ education ☒ scientific/research ☒ recreation/aesthetic

	LOCAL	REGIONAL	STATE	NATIONAL	INTERNATIONAL
REPLICATION		common	rare	rare	rare
RERESENTATION					

SIGNIFICANCE ○ Local ○ Regional ○ State ○ National ◉ International ○ Unknown

MANAGEMENT ○ adequately managed ○ input required ◉ threatened

REGISTER OF NATIONAL ESTATE ○ on fully ◉ on partly ○ not on

INFORMATION SUPPLIED BY GSA files 2003 DATE 12.12.2003

COMPILED BY DATE

REVISED BY DATE

OTHER REFERENCE NUMBER NV EXTRA INFORMATION WITH HARD COPY ○ Yes ○ No

Geological Feature Data Sheet **SHEET 2: DESCRIPTIVE INFORMATION**

REFERENCE NUMBER **PR 012** Tower Hill

DESCRIPTION

Tower Hill is a complex basaltic nested maar which erupted 30,000 years ago. It comprises a main crater 3.2 km X 2.4 km with a surrounding tuff ring. The steep inner walls of the ring anclose a flat floored crater over 90 m deep with a lake with 10 secondary scoria and ash cones or mounds and a lava flow representing later eruptions. Complex bedding structures of a range of pyroclastic materials (ash, lapilli and scoria) are exposed by disused quarries.

Features formed by phreato magmatic eruptions typify the stratigraphy of the outer rim. These include accretionary lapilli layers, base surge cross-bedding, planar bedded and massive airfall deposits, limestone and basalt bombs and a local unconformity.

The numerous nested craters and mounds illustrate multiple stages of volcanic activity and contain important palynological records.

SIGNIFICANCE STATEMENT

One of the best examples workd wide of a maar volcano and the youngest and best preserved maar in Victoria. Its eruption generated volcanic morphology is extrodinarily well preserved and provides excellent scientific data on maar eruption processes. Best example of a nested maar in Australia. The palynological record from the swamps presents an excellent palaeo-environmental record for the region. An outstandin g teaching and research site.

REFERENCES

	PP.
Black, 1981	
Edney, 1983	
Gill, 1967	
Ollier & Joyce, 1964	357 - 376
Marshall, 1977	195 - 376
Rosengren, 1994	281 - 284.
Edney et al., 1985	302-303.
D Costa et al., 1989	461-482.
Cas, 2004	

ADDITIONAL REFERENCES

○ Yes ○ No

for a region may also be an outstanding or rare example on a state or national level. Significance ratings contain a degree of subjectivity for they are in part determined by the existing data about the site as well as the level of knowledge of the assessors of similar sites elsewhere. It is important to note that geological, including geomorphological, significance may not relate to the aesthetics of a landscape. Some sites of very high significance may not be at all aesthetic, e.g. quarry faces or road cuttings whereas aesthetically pleasing views may not always be assigned a high geological significance. Significant sites are also not the same as excursion sites. All excursion sites are significant and will be able to be assigned a significance rating, but many such sites will often be of local or regional significance. In many cases, highly significant sites are unsuitable for excursion sites as they may be damaged, but this obviously depends on the type of site.

Geological sites possess at least one of the following attributes to be considered for assessment on their significance:

- a type section of a geological unit,
- a fossil locality,
- exposures of a range of features characteristic of the rock unit, or exposures of features which are unusual in the rock unit,
- an unusual occurrence of a particular feature or mineral,
- an illustration of tectonic and/or volcanic processes,
- features which enable palaeoclimatic reconstruction,
- demonstration of the effects of weathering, erosion and/or deposition on landform evolution. This geomorphic process may be active or relict,
- a representative example of a landform type.

Sites are identified using the alpha/numeric identification numbers based on the 1:250000 geological map series covering Victoria The site ID is associated with the relevant map sheet e.g. ML Melbourne, QN Queenscliff, BD Balranald and Deniliquin; BN Bendigo; MD Mildura; TL Tallangatta and WN Wangaratta and part of Jerilderie. Sites are given a number e.g. ML 104 (Bacchus Marsh Council Trench), PR 012 (Tower Hill). Where a site has sub-sites e.g. Port Campbell National Park (CL 020), the sub sites are identified by a decimal system e.g. CL 020.1, CL 020.2 etc. These sites have their own significance as well as the complete site.

The details of the site are entered in the Geological Society of Australia (Victoria) Geological Heritage database; a Filemaker Pro 5 database of four linked databases. This was specially designed for this work and is proving to be an excellent and simple way of managing this data. The linked databases are the main database of entries (see example on pages 3 and 4), maps, municipalities and bibliographies.

Anyone who is interested in being involved in this ongoing work please contact Sue White on 9328 4154.

Welcome to new members admitted at the May meeting ...

Member:	Peter Egberts, Andy Tomkins, Marcus Onken
Student Member:	Adrian Corvino, Louise Edwards, Lawrence Leader, Glen Phillips, Anthony Schofield

Dates for your diary

"We were meant to be here ..." From starts to brains: pathways to consciousness in the natural world

When: 20-21 June 2006
Where: Australian Academy of Science, Canberra
Details: manningclark@ozemail.com.au or phone 02 6295 9433

This multidisciplinary conference is convened to pay tribute to the work of Paul Davies, whose books and articles explore pathways from the big bang, subatomic particles, atoms and molecules, the origin of life and intelligence to realms of human consciousness and philosophical and spiritual dimensions. Speakers include Paul Davies, Phillip Adams and many more.

GSA members forum

When: Sunday 2 July 2006 from 10–12 a.m.
Where: Melbourne Exhibition and Convention Centre, Room Corryong 5

GSA is to hold an open forum meeting to discuss key issues facing the Society. In particular, we want to have a broad discussion of the advantages and disadvantages of proposed/potential mergers with the Australian Institute of Geoscientists (AIG) and Australian Society of Exploration Geophysicists (ASEG). The presidents of both organisations will attend. Other matters to be discussed include (1) the current structure of GSA, with a National Executive and State and Territory Divisions, and (2) membership matters, including the difficulty all societies are having attracting young (graduate) members.

We welcome all GSA members to this open forum. If you can't attend either the forum, or the AESC, we would appreciate getting any input you may care to offer on these important matters. Contact Tony Crawford on (03) 62262490 or (03) 62262472, or email Tony.Crawford@utas.edu.au.

**Note: the GSA Council meeting continues on in this room straight afterwards from 12–5 p.m.*

Australian Earth Sciences Convention 2006: program update

Sunday 2 July to Thursday 6 July 2006 – phone 9417 0888 or look up www.earth2006.org.au

Program Update: Special Symposium: Environmental and geological hazards and risks to Australasia: multi-disciplinary research for an environmentally sustainable Australia and neighbouring countries.

**Note: single day sessions can be booked for those not able to attend the entire Convention.*

Free workshop: Integrated Ocean Drilling Program (IODP)

When: 26–27 August 2006
Where: University of Melbourne, Earth Sciences Department
Details: Helen Bostock, Office to Promote Marine Geoscience in Australia, ANU
Phone 0403 828 571 or look up http://www.margo.org.au

The workshop is aimed at learning more about opportunities, facilities and new technology available through membership of IODP. Day 1 will be a series of presentations from invited US, Japanese and European researchers involved in IODP about the structure, themes and different platforms on offer through the program. Day 2 will include a series of short presentations about ideas or proposals that are in the pipeline for IODP expeditions. The workshop will be relatively informal with opportunity to discuss ideas, get feedback for expedition proposals and form collaborations.

Please contact Helen Bostock if you are interested in attending. If you would like to present a proposal, an abstract/outline would be required by 29 June 2006. Presentations may include proposals that have already been submitted to the IODP process, or they be new ideas requiring further work and/or collaboration.

16th Annual VM Goldschmidt Conference: "Geochemistry Downunder"

When: 27 August to 1 September 2006
Where: Melbourne Exhibition and Convention Centre
Registration: on-line at www.goldschmidt2006.org or contact conference managers
Early bird fee: for registration by 30 June 2006
Details: Conference Managers: phone (02) 9265 0700 or email goldschmidt2006@tourhosts.com.au

This conference promises to be a landmark event. See the April edition of *The Victorian Geologist* for details.

Congratulations to Dr William D Birch AM
For service to geological science, particularly through the study and documentation of the geology of Victoria and to a range of professional organisations.

Vale Frank Beavis

Former geologist and palaeontologist Frank Beavis passed away on 5 May 2006 in Cowra, NSW, aged 81. He had practised as a solicitor there for some years. Many GSAV members would remember him from his time as a lecturer in structural geology at the University of Melbourne.

Born 1 August 1924, Francis Clifford Beavis was educated at the University of Melbourne (BSc, PhD), Cambridge (MA) and the University of New South Wales (LLB). Career highlights include Engineering Geologist SEC Victoria 1948-57, Senior Lecturer Lecturer in Geology, University of Melbourne 1957-73, Foundation Professor of Engineering Geology, University of New South Wales 1973-86, Head, School of Applied Geology 1984, 1973-79, Emeritus Professor of Engineering Geology, University of New South Wales 1986, Barrister at Law 1987-94, Consultant Geologist 1992- . President Royal Society of New South Wales 1978.

Biographical source: Australian Science Archives Project, University of Melbourne (www.asap.unimelb.edu.au).

Postgraduate Seminars: everybody welcome

The University of Melbourne Earth Science Postgraduate Student Society (ESPG)
presents
Earth Science Seminars every Friday at 4.00 p.m.
in the
Fritz Loewe Lecture Theatre
Earth Science Building (cnr Swanston and Elgin Streets)

followed at 4.45 p.m. by drinks and refreshments
in the tea-room, 4th floor. $2 per person.

Forthcoming talks:

30 June: John Bye (to be confirmed)
Ocean currents in south Australia

7 July: AMOS postgraduate meeting. Annual informal gathering of local honours and postgraduate students in atmospheric and ocean sciences to provide short presentations of their work.

14 July: TBA

21 July: Estee Woon
Proterozoic calcified microbes from the Flinders Ranges

28 July: Jonno Giddings
Neoproterozoic carbon isotope stratigraphy and global climate change

4 August: Alex Pezza
A meterology topic to be announced

Further information: http://www.earthsci.unimelb.edu.au/php/seminars_upcoming.php

Visit the GSAV on www.vic.gsa.org.au or the GSA on www.gsa.org.au

Booking slip for A.W. Howitt lecture on 29 June 2006

The Royal Society of Victoria, 9 Victoria Street, Melbourne 3000 *Phone 9663 5259*

BOOKING SLIP FOR A.W. HOWITT LECTURE

I/we wish to attend at 8 p.m. on Thursday 29 June 2006 and enclose a cheque for $.....
($15 per person) payable to The Royal Society of Victoria.

Names: .....
.....
.....

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Program:	*vacant*	
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THE VICTORIAN GEOLOGIST

June 2006 Special Edition

THE GEOLOGICAL SOCIETY OF AUSTRALIA
Victoria Division

Announces the winner of the 2006
SELWYN MEDAL

Professor Chris Wilson

Professor Wilson will receive the GSA (Victoria Division)'s 2006 Selwyn Medal
at the forthcoming Australian Earth Sciences Convention
to be held at the Melbourne Convention Centre.

The award will be made on Tuesday 4th July during the GSA Awards Ceremony (9.20–9.40 a.m.)

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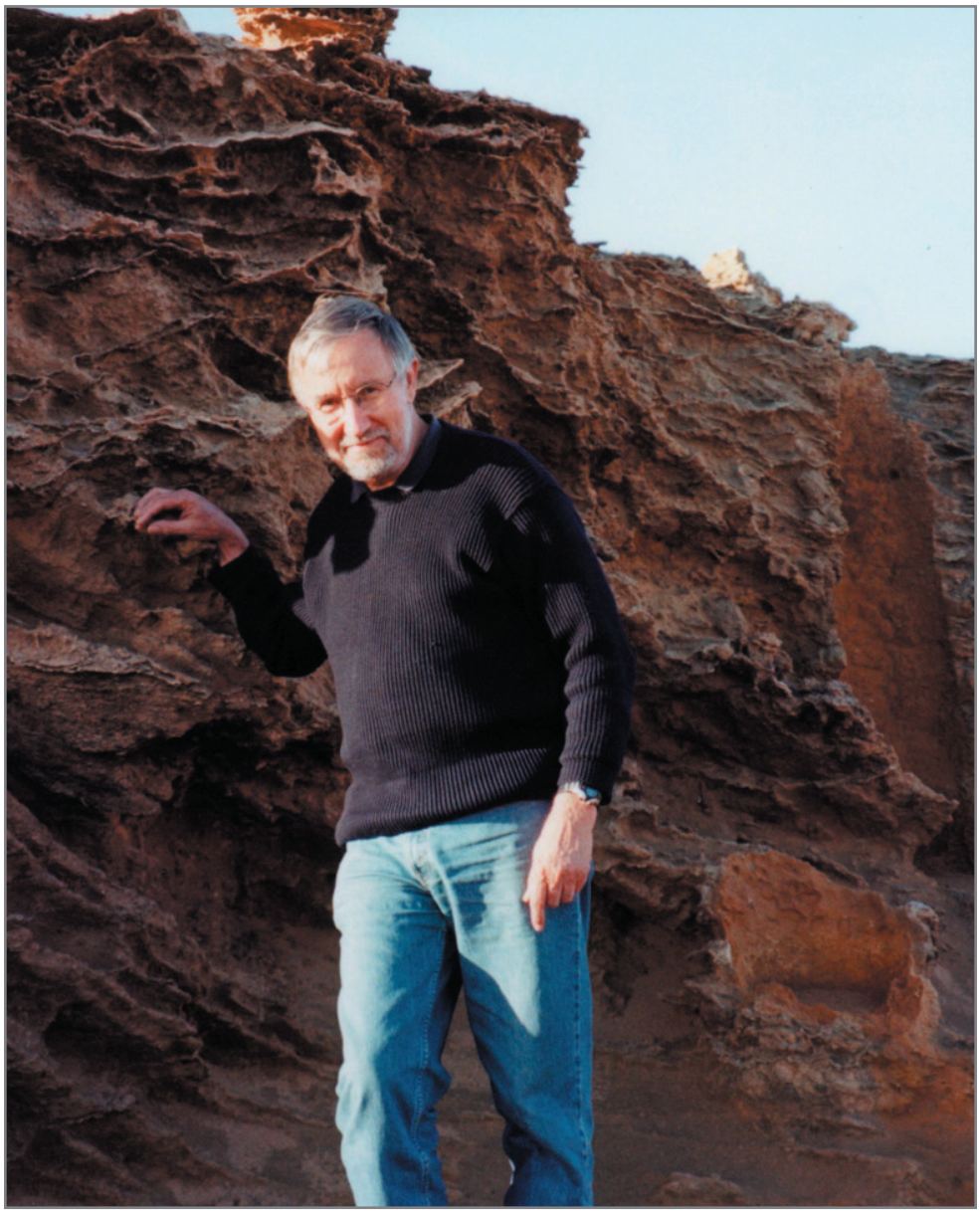
THE SELWYN MEDAL

The Selwyn Medal is named in honour of Sir Alfred Selwyn, an eminent Victorian pioneering geologist and founder of the Geological Survey of Victoria. It is awarded, usually yearly, to recognise significant ongoing or former contributions of high calibre to any field of Victorian geology. A candidate for this medal should have made a major contribution to new knowledge of the geology of Victoria; or a significant reinterpretation of it based on critical observations; or have contributed importantly to a major mineral or oil discovery; or have produced important geological publications; or have been involved successfully in the development of the geological profession.

The Geological Society of Australia (Victorian Division) is very pleased to award Professor Chris Wilson the 2006 Selwyn Medal for his significant contribution to the understanding of the geology of Victoria.



Chris Wilson at the petrified forest near Portland, western Victoria, in 2004.

2006 SELWYN MEDAL CITATION

Professor Chris Wilson has brought to Victoria a background of experience elsewhere; he has applied that experience both to the elucidation of fundamental geological problems within Victoria, and to ore discoveries; and he has continued to be deeply interested in major geological problems in other countries – other continents. In addition, Chris has supervised numerous students, and taught and encouraged many more, at The University of Melbourne, and also participated in the evolution of earth science teaching in Victorian Universities.

Chris took his first degrees at the University of Sydney in 1965 and 1966, and completed his Doctorate in 1970 at ANU, on *The microfabric of a deformed quartzite sequence, Mt Isa, Australia*. He then spent some years in Holland before returning to an academic position in the then Department of Geology at The University of Melbourne in 1974. His publications through the first few years in Victoria reflect his deep interest in the deformation processes in rock-forming minerals, studied with both optical and electron microscopy. This led to setting up of a laboratory to study ice deformation experimentally, work that has continued from 1979 to the present day - with outcomes that are being used now to study vein arrays in the Victorian Goldfields.

In 1982 the first of his numerous papers on aspects of Victorian geology appeared, and since then such papers have appeared almost every year, as Chris and his students applied their knowledge to unravel the structure of the Mallacoota area, or the contact metamorphism at the Stawell granite. The number and range of these contributions is too great to digest here, but many of Chris's insights were shared in his contribution to the Geology of Victoria, 3rd edition, while the Joe Harms Medal, awarded to him with John Miller and Jon Dugdale, recognised the work that lead to the discovery of the Golden Gift gold deposit at Stawell in western Victoria.

In parallel with this, Chris has also worked productively in the field in both Antarctica and Asia, participating in major collaborations in both continents, and this work continues now. In all, his publication list encompasses over 170 papers, chapters, guides, and reports – and an award-winning video demonstrating shear processes in ice, as a rock analogue. The contribution that Chris has made to Victorian and Australian geology through his teaching activities is also significant. Undergraduate students have frequently returned from field trips with Chris with new enthusiasm for the subject. He has supervised over a hundred Honours and Masters students, and more than 30 PhD students (including a small number of co-supervisions, and students now in process). He was Head of the Department for only three years, between 1989 and 1991, but those years saw significant changes in Melbourne and Victorian geology education. Chris oversaw the amalgamation of the Geology and Meteorology departments to form the School of Earth Sciences, in 1989. Then, he worked with his colleagues at La Trobe and Monash Universities to bring about the creation of the Victorian Institute of Earth and Planetary Sciences (VIEPS), and negotiated major grants from the Victorian Education Foundation to push the new venture out. On top of that, he also initiated the Hydrogeology program within the School, anticipating the growing demand from incoming students for hydrogeology and environmental geology studies. Each of these developments has left a lasting, positive mark on the School at Melbourne, and on Victorian geological affairs.

Chris Wilson has been involved in numerous other administrative activities at University, state, national, and international levels, including reviewing programs, organizing meetings, as well as various faculty boards. To come back to Victoria and the GSA, Chris has been a GSAV Committee Member for six years, and Division Treasurer in 1988, as well as a longtime servant of the Specialist Group for Tectonics and Structural Geology.

Dr Lindsay Thomas on behalf of the Geological Society Victorian Division.

There is no doubt that he has made important and significant contributions to Victorian geology through his works in the Mallacoota and Stawell regions of the state. He has also contributed significantly in the teaching and mentoring of many students since the early 1970's through the University of Melbourne.

Prof. David Gray
Australian Professorial Fellow, Earth Sciences, The University of Melbourne

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THE VICTORIAN GEOLOGIST

July 2006

THE GEOLOGICAL SOCIETY OF AUSTRALIA
Victoria Division

Next General Meeting: Thursday 27 July at 6.15 p.m.

Postgrad Night @ Monash

GSAV-sponsored postgraduate students from the University of Melbourne present their talks from AESC 2006.

General Meeting at 6.15 p.m. - Monash University
Lecture Theatre E7, Building 72 (Engineering)
Normanby Road, Clayton North

See Melways Map 575 (475 in older editions) for locations within Monash University
Parking area adjoins West Ring Road

Kate Bassano
A feasibility study of the application of the Pb-Pb isotope step-leaching technique to ore minerals

John Miranda
Late Cainozoic environmental evolution of the western Murray Basin:
evidence from the sedimentary record

Glen Phillips
Early Palaeozoic cooling of the southern Prince Charles Mountains, East Antarctica:
synchronous cooling of three stratigraphic levels

Joanne Whelan
The relationship between gabbros and granites in the Lachlan Fold Belt:
an example from Arte River, East Gippsland

Estee Woon
Petrogenesis of Neoproterozoic Allochthonous Reef Carbonates,
Flinders Ranges, South Australia

Heritage & History News

History and Heritage join forces at the AESC

Susan White
Convenor GSA (Vic) Heritage Subcommittee

The AESC has come and gone in a buzz of excitement. The joint History & Heritage session on Monday 3 July was successful and well-attended, and combined seven papers on geological heritage with four history of geology papers, including a keynote address by Doug McCann.

The Heritage papers were an eclectic group: Joane McKnight (*Celebrating Planet Earth: UNESCO-assisted Geoparks in the Australasia-Pacific region*) discussed the Western District Victoria & SA volcanic geopark proposal. Bernie Joyce delivered two papers: *Geological heritage of Australia: selecting the best for Geosites and World Heritage and telling the story for geotourism and Geoparks* and *The National Trust and landscape heritage in Victoria: recent assessments of volcanic landscapes in Western Victoria.* Mel Mitchell explained the protocols and procedures that the Victorian Division subcommittee uses in *Geological Heritage sites: a procedure and protocol for documentation and assessment.* Roger Pierson recounted the tale of *The Bacchus Marsh Council Trench: its significance and recent conservation.* Armstrong Osborne enthusiastically delivered *Multiphase and multi-process caves of the impounded karsts of Eastern Australia: a basis for World Heritage listing?* and the session concluded with Dermot Henry from the Museum of Victoria describing the geological collections and their uses in *Museum Victoria's geological collections: a community resource.*

The history papers were led by Doug McCann's keynote address: *John Walter Gregory and his 1906 publication 'The Dead Heart of Australia'*. The centenary of Gregory's publication was marked by reflecting on his many achievements during his short but busy time in Victoria. The book itself was modest in significance, reporting as it did a 1901–1902 expedition to Lake Eyre that was led by Gregory and consisted of a small group of staff and students from the University of Melbourne. The expression 'dead heart', however, was to capture the imagination of the Australian public.

Guy Holdgate described a fine series of Department of Mines Special Coal Reports (*Stirling and coaly coast: the discovery of black coal in Victoria*), David Branagan shed light on Selwyn's little-known second career (*Alfred Selwyn: the post-Victoria years in Canada 1870–1903*) and the afternoon finished with a fascinating story from John Long on one of Australia's most significant fossil localities: *Swimming in Stone: the history and significance of the world famous Gogo fish fossil sites in Western Australia*.

Geological Heritage across Australia in GSA varies with the energy of particular groups in the various divisions but there is significantly more interest than there was a few years ago. The profession as a whole is coming to realise that there is a role for good management of our important geological sites and that GSA has an important role to play. More news in TAG and in future Victorian Geologists!

Victoria Rules

The GSA AGM took place at 6 p.m. on Tuesday 4 July at the Melbourne Convention Centre, where a new Executive Committee was elected to steer the GSA until the next Convention in Perth in February 2008. The Executive rotates between the States: retiring Taswegians, including President Tony Crawford, Hon Sec Patrick Quilty and Hon Treasurer Peter McGoldrick, were thanked for their efforts and achievements, and a new Victorian-based Executive was duly elected as follows: President: Andrew Gleadow, Hon Treasurer: Fons VandenBerg, Hon Sec Marilyn Moore, Hon Promotions Officer Bill Birch and Councillors Stephen Gallagher and Mike Sandiford. Continuing positions include Hon Editor AJES Tony Cockbain, Hon Editor TAG Jess Tyler and Hon Admin Officer Simon Turner. Tony Crawford remains on the Exective as Past President; Vice-President Peter Cawood will represent next incumbent WA, and there will be several coopted members from other states.

BICENTENNIAL GOLD 88 ENDOWMENT

REPORT FOR THE YEAR 2005

There were three successful applications for grants from this Endowment for 2006. Of the grants distributed, one was in support of a technical excursion by undergraduate students, one for undergraduate and one for post-graduate research.

A total of $10,000 was distributed among the recipients as follows:

- **The University of New England:**

  To assist with costs associated with a technical field excursion in New South Wales for 10 undergraduate geology students.

- **Monash University:**

  To help fund field work for two honours students on projects related to the Mt Read Volcanics in western Tasmania.

- **Monash University:**

  To assist a PhD candidate with field costs related to studies of aspects related to porphyry copper mineralisation in island arc settings.

The assistance of Professor David Gray and Dr Ingrid Campbell with the screening process is gratefully acknowledged. Thanks also to Ms Simone Cuzzupe for secretarial support.

Gerhard K. Krummei

Chairman - Working Group
Bicentennial Gold 88 Endowment

Dates for your diary

16th Annual VM Goldschmidt Conference: "Geochemistry Downunder"

When: 27 August to 1 September 2006
Where: Melbourne Exhibition and Convention Centre
Registration: on-line at www.goldschmidt2006.org or contact conference managers
Early bird fee: for registration by 30 June 2006
Details: Conference Managers: phone (02) 9265 0700 or email goldschmidt2006@tourhosts.com.au

Co-sponsored by the GSA, the 16th Annual V.M. Goldschmidt conference in 2006 is being hosted for the first time in the southern hemisphere. Australia's unique, plate-scale natural laboratory will form the backdrop for the presentation of new ideas on a diverse range of geochemical topics (everything from advances in geochemical techniques to formation of the solar system, evolution of the lithosphere, orebodies, surface processes, subduction processes, mantle convection, tectonic processes, aqueous and ocean geochemisty, climate and environment). Check out the excellent website for the comprehensive scientific program, the long list of Australian and international keynote speakers, and field trips to iconic geologic sites at Mt Isa, the Great Barrier Reef, Lachlan Fold Belt, Taupo volcanic zone (NZ), western Victoria, New Caledonia, Broken Hill, and the Pilbara. This conference promises to be a landmark event.

Welcome to new members admitted at the June meeting ...

Member: Malcolm Wallace
Transfer from Student to Member: Jamie Andrew Robinson

Can you help an in-schools program?

Minerals Education Victoria currently runs an education program for primary school children. The program consists of eight topics including "Oil and Gas", and PESA sponsors this session so that it is run free of charge to schools.

The PESA Education Subcommittee is presently working with MEV to enhance this program and to extend it to secondary students. To this end, MEV is compiling a register of industry professionals who would be willing to attend presentations and speak at career days. MEV teachers give the presentations – your role would be to answer questions about your own career and experiences. PESA's Education Subcommittee, in the person of Sandra Menpes, will maintain the register, which will be confidential.

If you would like to volunteer in this capacity, please email Sandra (smenpes@eprl.com.au) with the following details: contact details, preferred school district (e.g. NE suburbs, inner city ...), subjects completed in final year of school, Tertiary degree(s), years spent in oil and gas industry, countries worked in, current occupation, special areas of interest and any other comments.

Your involvement would be greatly appreciated!

Postgraduate Seminars: everybody welcome

The University of Melbourne Earth Science Postgraduate Student Society (ESPG)
presents
Earth Science Seminars every Friday at 4.00 p.m.
in the
Fritz Loewe Lecture Theatre
Earth Science Building (cnr Swanston and Elgin Streets)

followed at 4.45 p.m. by drinks and refreshments
in the tea-room, 4th floor. $2 per person.

Forthcoming talks:

28 July: Jonno Giddings
Neoproterozoic carbon isotope stratigraphy and global climate change

4 August: Talal Al-Hosni
A topic to be announced

11 August: Andrew Gleadow
Apatite Fission Track Thermochronology - what can it really tell us?

18 August: Alex Pezza
Catarina: the first hurricane ever observed in the south Atlantic and links with climate change

25 August: Louise Edwards
The New Britain Arc: unique insight into island arc processes

Further information: http://www.earthsci.unimelb.edu.au/php/seminars_upcoming.php

Visit the GSAV on www.vic.gsa.org.au or the GSA on www.gsa.org.au

2006 Selwyn Lecture

Thursday 28 September
at the University of Melbourne

Carbonate Island Karst: Constraints in Time and Space

John E. Mylroie

Department of Geosciences
Mississippi State University

See forthcoming newsletters for more details

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If you are an unfinancial member, please note that this is your last newsletter.

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THE VICTORIAN GEOLOGIST

August 2006

THE GEOLOGICAL SOCIETY OF AUSTRALIA
Victoria Division

Next General Meeting: Thursday 31 August at 6.15 p.m.

No mountains to snow on:
Post-Eocene uplift of the Eastern Highlands of Victoria:
Evidence from Cenozoic deposits

Guy Holdgate

6.15 p.m. at the University of Melbourne
Fritz Loewe Theatre, Earth Sciences Building, cnr Swanston & Elgin Sts.

Preceded at 5.30 p.m. by drinks and nibbles in the tea-room, 4th floor. $2/person.

Since Andrews (1911) first introduced the idea of the Pliocene Kosciusko Uplift in the southeastern highlands of Australia, there has been considerable debate about the validity of this Cenozoic uplift event. Modern research refutes extensive young uplift in the highlands and argues that highland relief was in existence by the Cretaceous. This seminar will examine evidence from high level Cenozoic palaeovalley deposits and palaeoflow directions in Victoria's eastern highlands that indicates a northward shift to the drainage divide since the Eocene and up to a kilometre of uplift. New shuttle radar imagery indicates extensive ENE and NE-trending faults that cause block displacements to the Cenozoic deposits. From this we suggest that a major period of regional uplift and exhumation in the eastern Victorian highlands began during the Late Eocene and continues to present.

Reference: Andrews, E.C., 1911. Geographical unity of Eastern Australia in Late and Post Tertiary Time, with application to biological problems. *Journal of Proceedings Royal Society of New South Wales*, 44, 420-480.

Associate Professor Malcolm Wallace receiving the 2005 Stillwell Award from Dr Stephen Gallagher, Chairman of the GSA (Victoria Division) at the July General Meeting at Monash University.

The Geological Society of Australia
Victorian Division
&
International Association of Hydrogeologists
Victorian Branch

presents the

Selwyn Lecture for 2006

Thursday 28 September

Carbonate Island Karst: Constraints in Time and Space

John E. Mylroie
Mississippi State University

6.30 p.m. at the University of Melbourne
Fritz Loewe Theatre, Earth Sciences Building
cnr Swanston & Elgin Streets Carlton

The Selwyn Lecture will be preceded at 5.30 p.m. by drinks & nibbles
($2 per person).

After the lecture there will be a dinner at a local restaurant.
Please RSVP to Susan White by Tuesday 26 September to assist with booking
(03) 9328 4154 or susanqwhite@netspace.net.au

Goldschmidt is here!

When: 27 August to 1 September 2006
Where: Melbourne Exhibition and Convention Centre
Registration: on-line at www.goldschmidt2006.org or contact conference managers
Early bird fee: for registration by 30 June 2006
Details: Conference Managers: phone (02) 9265 0700 or email goldschmidt2006@tourhosts.com.au

Check out the excellent website for the comprehensive scientific program, the long list of Australian and international keynote speakers.

****Reminder from GeOz ****
The IMAX spectacular Forces of Nature is showing at the IMAX Theatre (Melbourne) until the end of the year.

Welcome to new members admitted at the June meeting ...

Member:	Douglas John Kirwin
Student Member:	Sara Jakica
Transfer to Tasmania Division:	Andrew Jones

Your GSAV Committee at Work

Five members of the Victoria Division Committee manned the GSA's display for two days at the recent Geography Teachers Association of Victoria annual conference.

Along with a dazzling new "One Planet, So Many Stories" banner (courtesy of GSA's head office in Sydney), the display boasted a range of information sheets, books, catalogues and giveaways that interested a good proportion of the 500 or so teachers present at the conference.

Many geography (SOSE) teachers find themselves in the position of having to teach geological concepts to students in Years 7-10 without ever having studied geology themselves. Both Geoscience Australia and the GSA have over many years published educational materials suitable for use in schools. Helping to interest students in earth science is seen as more important than ever now that Geology is no longer a VCE subject in Victoria.

The Education Subcommittee is currently producing kits on various topics relevant to the Victorian curriculum. These contain information, references, links, classroom activities and excursion notes, and will be downloadable as pdf files from the GSAV website. The first two kits are well underway and should be available before December: 'Port Phillip' and 'Victorian Volcanoes'. Future topics might include fossils and earthquakes, both of course with a Victorian focus.

We could use some more help with this project. If you are willing and able, please email Marilyn Moore on moore.me@bigpond.net.au

From the Office of the Prime Minister:

NATIONAL HERITAGE LISTING FOR GLASS HOUSE MOUNTAINS

I am pleased to announce that the rugged volcanic peaks of the Glass House Mountains are being added to the National Heritage List.

The Glass House Mountains are of outstanding value to the nation and have rightfully taken their place in the National Heritage List, which showcases the best of Australia's natural, historic and Indigenous heritage.

The Glass House Mountains of south-east Queensland are distinctive and spectacular. The dome-shaped hills and conical peaks dominate the landscape and are instantly recognisable.

Captain Cook first recorded and named the Glass House Mountains during his voyage up the east coast of Australia in 1770.

Rich in natural history, the volcanic peaks, formed 24-27 million years ago, represent the best example of an eroded central volcano complex in Australia. A series of eruptions led to the formation of at least 12 peaks; the highest at 556m, is Mount Beerwah.

The domes, cones and spires reaching out of a low landscape have fascinated geologists and geographers. Importantly they help us understand the volcanic history of the eastern Australia mainland. Recent research has also led to a greater understanding of the dynamic processes and evolution of rock types making up these volcanic centres.

The Glass House Mountains have inspired the works of many Australian artists, such as Lawrence Daws, Judith Wright, Conrad Martens, Peter Kennedy, David Malouf and Fred Williams, across a range of media including music, painting, poetry, photography and film.

I am delighted that the Glass House Mountains have become the 32nd entry on the National Heritage List. They join other important entries including Old Parliament House, the Australian War Memorial, the Sydney Opera House, Mawson Huts, and Captain Cook's landing site.

03 August 2006

http://www.pm.gov.au/news/media_releases/media_Release2057.html

Visit the GSAV on www.vic.gsa.org.au or the GSA on www.gsa.org.au

The University of Melbourne Earth Science Postgraduate Student Society (ESPG)
presents
Earth Science Seminars every Friday at 4.00 p.m.
in the
Fritz Loewe Lecture Theatre
Earth Science Building (cnr Swanston and Elgin Streets)

followed at 4.45 p.m. by drinks and refreshments
in the tea-room, 4th floor. $2 per person.

Further information: http://www.earthsci.unimelb.edu.au/php/seminars_upcoming.php

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The 2006 Selwyn Lecture

Abstract

Carbonate Island Karst: Constraints in Time and Space

John E. Mylroie

Department of Geosciences
Mississippi State University
Mississippi State, MS 39762 USA

The study of karst processes on young carbonate islands has yielded important insights into limestone hydrology because island size limitations provide tight constraints on spatial boundary conditions, while the youthfulness of the carbonate rocks defines the chronological boundary conditions. The young, or *eogenetic*, age of the carbonate rocks means a lack of diagenesis, such that primary porosity and grain characteristics play a greater role than in more mature limestones, where secondary features such as jointing dominate the hydrology. Mixing zones at the top and bottom of the fresh-water lens enhance rock dissolution, and also trap organics that create dissolutional aggressivity in most conditions. The vertical movement of the fresh-water lens as a result of glacioeustasy and local tectonics creates horizons of increased permeability. The relationship of the carbonate rocks to non-carbonate rocks on islands also has strong control on the resulting karst hydrology and geomorphology. The interplay of all these factors is described by the Carbonate Island Karst Model or CIKM, which has been successfully applied to carbonate islands in the North Atlantic, Caribbean, and Western Pacific.

Small islands made of entirely carbonate rocks function as modified diffuse flow aquifers, with large hydraulic conductivities and dissolutional voids or caves embedded in the aquifer. One class of these caves, called *flank margin caves*, are especially large and abundant as they form in the margin of the lens, where flow concentrates, and where the mixing zones at the top and bottom of the lens are superimposed. Conduit flow is rare. On large islands, the area to perimeter ratio is sufficiently great that diffuse flow is replaced by conduit flow. For carbonate banks, this creates diffuse flow conditions in small, remnant islands during glacioeustatic sea-level highstands, and conduit flow at lowstands when the bank is subaerially exposed to create a large island.

The development of enhanced permeability and macroscopic porosity (caves) in carbonate islands has many practical implications. As the karst system matures, the fresh-water lens thins as flow efficiency increases; as a result aquifer thickness is dependent on rock age, being thicker in younger rocks. Contaminants enter the aquifer by vadose fast-flow routes, and by diffuse flow, with quick migration within the lens. Land subsidence and collapse is controlled by overburden thickness. As paleokarst, the carbonate rocks act as hydrocarbon reservoirs. Recognizing diffuse flow, which produced voids at the carbonate paleo-bank edge, versus conduit flow, which drained the middle of the paleo-bank, leads to large differences in exploration and production strategies.

VUEESC 2006

Our Living Planet & its Resources

Monash University

20th Annual Victorian Universities
Earth & Environmental Sciences Conference

Thursday 26 October 2006

The GSAV's October General Meeting will follow on from the VUEESC conference at Monash University at 6.15 p.m. **Gary Gibson** and **Warren Peck** will speak on "Seismic Hazards in Underground Mines, with particular reference to events at Beaconsfield and Broken Hill". Not to be missed!

Welcome to the following new Members

Members: Andrew Pharaoh, Emmanuel Ernest-James

Student Member: Volker Pelle

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THE VICTORIAN GEOLOGIST

October 2006

THE GEOLOGICAL SOCIETY OF AUSTRALIA
Victoria Division

Evening Lecture

to follow the
Victorian Universities Earth & Environmental Sciences Conference

Thursday 26 October
at 6.30 p.m.

Seismic Hazards in Underground Mines

by

Gary Gibson and Warren Peck

Monash University
Lecture Theatre E7, Building 72 (Engineering)
Normanby Road, Clayton North

Preceded in the foyer at 5.30 p.m. by drinks and finger food
presented jointly by the VUEESC and GSAV. All are very welcome.

See Melways Map 575 (475 in older editions) for locations within Monash University
Parking area adjoins West Ring Road

Abstracts ... p2

Memorial Symposium for Prof. Neil Archbold
Friday 24 November 2006 at the Royal Society of Victoria.
Registration brochure enclosed: please note early closing date of 27 October.

SEISMIC HAZARDS IN UNDERGROUND MINES

Gary Gibson
Mining and Reservoir Triggered Earthquakes, and Anticipation of Future Events

Earthquakes in stable continental regions are often directly or indirectly associated with mining. The most active area in Victoria over the past 50 years has been south and north of the coalfields of the Latrobe Valley. The most damaging Australian earthquake was under the Newcastle coalfields during 1989, and during 1994 another shallow event of similar magnitude was under the Cessnock coalfields near Ellalong. The majority of the other recent New South Wales moderate magnitude earthquakes have been under or near to the coalfields south and west of Sydney. There have been many mining triggered and induced earthquakes in Australia, especially in Western Australia. The vast majority of South African earthquake activity is in the underground mining area.

By world standards the upper crust in Australia experiences very high horizontal compressive stress, and the majority of earthquakes occur on reverse faults. There is a considerable reserve of strain energy built up within rocks at shallow depths. This results in Australian earthquakes being at depths shallower than is usual, and probably contributes to the high proportion of reservoir and mining triggered earthquakes.

There are similarities and differences between triggered earthquakes and normal tectonic earthquakes, and it is possible to learn from the characteristics of each. A more complex model of earthquake clustering than was used in the past is now offering the possibility that some earthquakes may be forecast (with probability), although earthquake prediction (with certainty) seems impossible. Study of the highly clustered character of triggered earthquakes, and the relationship between the trigger mechanism, the stress field, and the resulting triggered events should lead to some improvements in anticipation of future events.

Warren Peck
Research into Seismic Activity in the Deeper Levels of the Pasminco Broken Hill Mine

There is a history of microseismic activity in the deeper levels of the Broken Hill mines, with the larger events being strongly felt by the miners underground and occasionally being also felt by residents in their homes. An average of 10 events occurred on those days when no major openings (stopes) were being created, rising to about 30 events per day during periods of stope creation. The footwall (eastern side) of the orebody, is noticeably more seismically active than the hanging wall. Many of the events appear to be the result of crushing and shearing of highly stressed rock in the walls and backs of mine development openings. A new set of joints (that were not present a few days earlier) was generated at the focus of one event.

A case study will be presented of a cluster of 16 microseismic events that occurred over a half-hour period at a relatively quiet period in the mine, with no blasts in the vicinity on that day and no stope creation activities having occurred for several weeks. Three of the events were “felt in town” and many were located in the walls and backs of mine openings frequently traversed by miners. It was simply a matter of good luck that no one was in the vicinity at the time.

Computer analyses show there is an excellent correlation between microseismicity and the increase in shear stress along joints. However, no basis was found at Broken Hill that would permit forecasting of the time and location of future seismic events.

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REGISTER NOW! www.geosci.monash.edu.au/vueesc/

VUEESC program on page 4 of this newsletter

Speaker John Milroie with Lindsay Thomas after the Selwyn Lecture at the University of Melbourne on 29 September 2006. The lecture was enjoyed by members of the International Association of Hydrogeologists and the Speleological Association as well as the GSA. (This year's Selwyn Lecture was jointly sponsored by the IAH).

VUEESC Program

Monash University Thursday 26 October 2006

9.00 **Introductory Remarks**

Keynote Address

SESSION ONE: GEOCHEMISTRY AND CRUSTAL PROCESSES			
9.30 – 9.45 Kohlmann et al.	9.45 – 10.00 Raveggi et al.	10.00 – 10.15 Woof	10.15 – 10.30 Dudgeon & Cas

10.30 **Morning Tea**

SESSION TWO: ENVIRONMENTAL SCIENCE				
11.00 – 11.15 McBain	11.15 – 11.30 Saunders & McMinn	11.30 –11.45 Tammireddy & Reid	11.45 – 12.00 Tutt et al.	12.00 – 12.15 Zhang

12.30 **Lunch**

SESSION THREE: ECONOMIC GEOLOGY		
1.15 – 1.30 Hough et al.	1.30 – 1.45 Triantafillou et al.	1.45 – 2.00 Van Dogen et al.

SESSION FOUR: HYDROGEOLOGY AND CLIMATOLOGY			
2.15 – 2.30 Raiber & Webb	2.30 – 2.45 Baliue & Webb	2.45 – 3.00 Hagendorn & Cartwright	3.00 – 3.15 Meneghini & Simmonds

15.15 **Afternoon Tea**

SESSION FIVE: PALAEOBIOLOGY				
3.30 – 3.45 Martin	3.45 – 4.00 Buchanan	4.00 – 4.15 Shean & Fitzgerald	4.15 – 4.30 Fitzgerald et al.	4.30 – 4.45 Charlton

SESSION SIX: GEODYNAMICS, TECTONICS AND BASIN EVOLUTION			
4.45 – 5.00 Mason	5.00 – 5.15 McLellan	5.15 – 5.30 Minarwan	5.30 – 5.45 Pankhurst

5.45 **Concluding Remarks**

End of conference drinks, finger food

Awards Presentation

6.30 **GEOLOGICAL SOCIETY OF VICTORIA EVENING PLENARY SESSION**

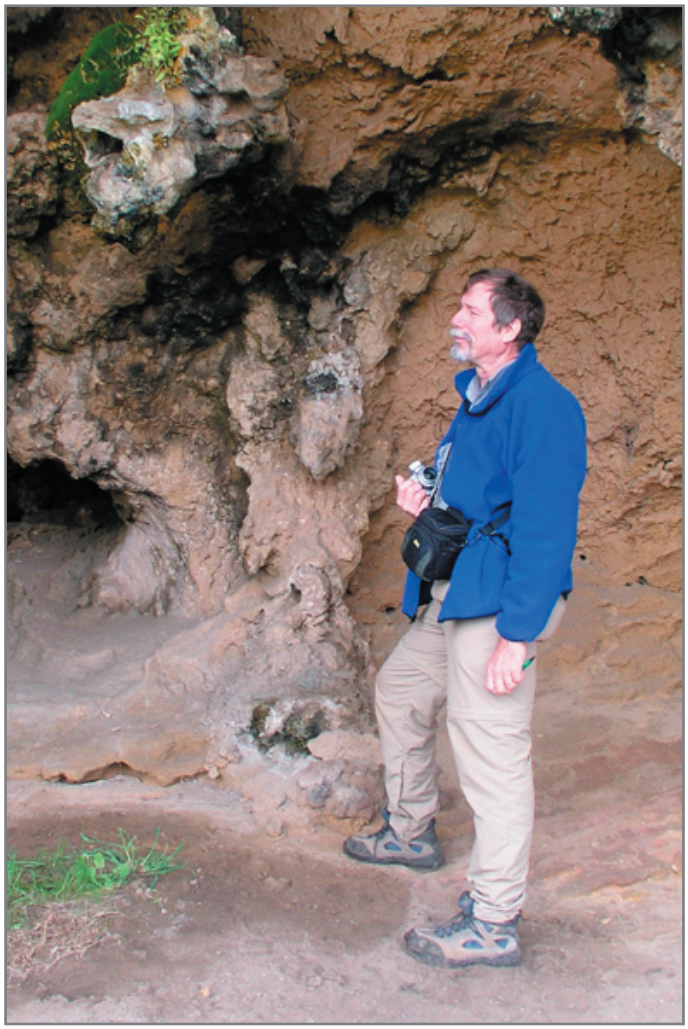
Gary Gibson & Warren Peck

Welcome to the following new Members

Members: None

Student Members: Ash Brown, Tim Liersch, Alexander Rey, Phillip Neckers, Daniel Marcuccio, Jessica Trainor, Verity Miles, Ashleigh Hood, Aleisha Paproth, Kate Mutimer, Lindsay Ward, Darren Irvine, David Hocking, Jenelle Kerr, Andrew Langendam, Tyler Lamb, Ian Dalla-Torre.

Visit the GSAV on www.vic.gsa.org.au or the GSA on www.gsa.org.au



2006 Selwyn Lecturer Dr John Milroie examines karst structures in the Bridgewater Caves at Taragal on a recent field trip to Western Victoria (photo by Susan White).

Notices

The **November General meeting** of the GSA (Victoria Division) will be held at the University of Melbourne at the usual time of 6.15 p.m. but not on the usual date. The meeting will be held one week earlier than usual on 23 November (the 4th Thursday) to accommodate student timetabling.

If you presently receive your copy of *The Victorian Geologist* by post, **please consider changing to an email subscription**. Although printing costs have been reduced significantly over the last year, printing and postage of the newsletter constitute a significant expense, presently consuming GSAV's entire operating budget (i.e. our share of membership dues received from head office in Sydney). In contrast, sending out email newsletters costs virtually nothing.

The GSAV would like to continue providing hardcopy newsletters to members who do not have internet access (compared with at least one other Division that now provides only email newsletters). But to do this we need to reduce costs. If you can help by changing your subscription to an email subscription please send your email address to Lindsay Thomas: thomas@unimelb.edu.au.

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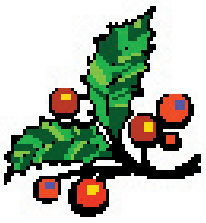
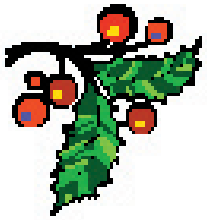


Last General Meeting for 2006
Thursday 23 November

at 6.30 p.m.



Postgrad Night @ Melbourne Uni

GSAV-sponsored postgraduate students from Monash University present highlights from 2006.

6.15 p.m. at the University of Melbourne
Fritz Loewe Theatre, Earth Sciences Building, cnr Swanston & Elgin Sts.

After the lecture there will be dinner at a local restaurant.
Please RSVP to Stephen Gallagher by Tuesday 21 November to assist with booking
Phone 8344 6513 or email or sjgall@unimelb.edu.au

Adele Bear
The eruption dynamics, transportation and depositional processes, and deposit characteristics of phonolitic ignimbrites: The “Tufo Rosso a scorie Nere”, Vico Caldera, central Italy.

Michiel van Dongen
Geology of the Pilbara, NW Australia - an overview of the GeoViSIO 2006 excursion.

Megan Hough
Dyke controls on gold mineralisation: Woods Point dyke swarm, SE Australia.

Sarah Martin
Insects of the Lower Jurassic Cattamarra Coal Measures, Western Australia: a preliminary look at a new fauna.

Wendy Mason
Effects of a buoyant aseismic ridge on an inter-oceanic subducted slab: case study of the Izu-Bonin-Mariana subduction zone.

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