

May 2011

THE GEOLOGICAL SOCIETY OF AUSTRALIA  
Victoria Division

## Next General Meeting

Thursday 26th May at 6:15 p.m.

### **Karst features and remnant dune systems on the Nullarbor Plain, Australia**

**Shannon Burnett**

Recipient of a GSAV Student Research Scholarship

**Fritz-Loewe Theatre, Earth Sciences Building, The University of Melbourne**

Preceded at 5:30 p.m. by drinks and nibbles in the tea-room, 4th floor. Cost \$2

Talk will be followed by time for discussion

The Nullarbor Plain covers an area of ~200,000 km<sup>2</sup>, which makes it Australia's largest karst area and one of the world's great karst areas. This semi-arid environment is famous for its low relief, lack of vegetation and lack of surface water. This karst landscape is often considered featureless, but many karst landforms can be found including dolines, blowholes, dongas, relict river courses and caves, which contain a variety of speleothems (Davey et al, 1992; Lowry & Jennings, 1974).

Karst features (blowholes, dolines, shallow and deep caves) are not concentrated along the coastline, with a gradual northwards decline, as previously postulated. Instead they are concentrated in two bands running roughly parallel to the cliffed coast and the Hampton scarp (coastal scarp). A ~20km wide coastal band of features is seen only when all karst features are plotted on the one map. However the main band is a larger, higher concentration of predominantly blowholes, dolines and shallow caves between ~50-85km inland in the east and ~45-80km inland in the west. The shallow caves were probably formed by mixing corrosion associated with the seawater/freshwater interface along a Miocene coastline. Any deep caves have been formed by extensive modification by collapse processes. Blowholes are the most numerous karst feature on the Nullarbor; they have an average density of 0.11/km<sup>2</sup> in the intensely searched areas, giving possibly ~22,000 blowholes for the entire area of the Nullarbor.

The surface of the Nullarbor is covered by an undulating landscape of ridges and swales, with four different orientations. The ridges and swales are not a result of joint control as previously stated, instead they are caused by dissolution of limestone in the swales of dune systems that since have eroded away, except for a remnant dune system ~2km west of Thampanna Cave (5N206). These dunes, and hence the ridges and swales, formed between 5 Ma – 18,000 yr B.P., probably during the early part of the Pliocene (5-3Ma) and during glacial periods during the Pleistocene, especially at the LGM (~18,000 yr B.P.).

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## AGM REPORTS

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### Chair Report



There are several things that I wish to report on from the past year. This past year we have had an excellent array of speakers at the monthly meetings, and despite not holding a Selwyn Symposium have had a good year. The division has also taken the opportunity of using the funds that would normally support the Selwyn Symposium to offer additional student travel awards. This has seen the division support student travel for both fieldwork and conference attendance with the requirement that they either offer a talk or newsletter article. The newsletter has also gone from strength to strength largely due to the enthusiasm of the editors. I would like to thank Alison Fairmaid for all her work and for passing over the baton so successfully to Gemma Prata. Gemma in turn is moving on later this year to study for a Ph.D. at Oxford and we wish her all the best. Indeed I would personally like to thank all the members of the committee for their hard work and the time that they put in to the division.

There are several other things that have been operating in the background particularly in relation to head office. The Geological Society of Australia has been working with the Divisions to develop a process that would enable the society to report a consolidated set of accounts. This is a audit requirement and the Victorian Division has provided input suggesting mechanisms that would minimise the amount of work required by both the divisional treasurer. At the same time the Geological Society of Australia has been rebalancing the investment portfolio moving it onto a new platform. As we are well aware the GSA federal investments suffered in the GFC and this has been the response. The Federal office have asked divisions to place all their investments within this platform to form a GSA Bank. The Victorian Division believe that the current investment platform is serving our interests well and given the lack of historical data about the new investment platform being used by the Federal office that it would be better to stay with the current arrangements.

Once again thank you to all members of the division that have helped out this year.

David Cantrill

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### Heritage Subcommittee Annual Report 2010 - 2011

The Geological Heritage subcommittee continues to work towards better understanding of geological heritage in the state. The past year has again seen a continuation of the work we have been doing for some years.

The data-base of sites has been maintained. New sites continued to be added from previously published geological significance site reports and some recent consultancy reports. This data-base has had a number of requests for information.

The committee continues to be heavily involved with the Bacchus Marsh Council Trench management committee. It has also given advice to consultants and people wishing to object to particular development projects. We are always very careful regarding objections as the GSA is not opposed to development per se. However some advice on the significance of particular sites is useful.

There has been an increase in the interest shown by local municipal planners in sites of geological significance; this is probably a result of the demise of the Register of the National Estate and the concentration by the

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## AGM REPORTS

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Federal department of Heritage on sites and areas of only National significance or on the Commonwealth Heritage List (ie commonwealth land). Recently I have been approached by Parks Victoria regarding sites on land managed with them and I am hopeful that this will bring better understanding of geological matters as well as better management.

There has been an increase in the number of groups, including Parks Victoria who have been assisted with information on signage.

I wish to thank the members of the subcommittee for their work throughout the year.

Susan White  
Heritage Convenor

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## GSA VICTORIA DIVISION AWARDS COMMITTEE

### 2010 ANNUAL REPORT

#### 2010 Awards

I wish to thank the members of the Awards Committee for their continued support during the year.

The following awards were given:

#### 2010 Selwyn Medal

The **2010 Selwyn Medal** was awarded to **Professor Mike Hall** of Monash University in recognition of his significant contributions to the understanding of the geology of Victoria, in particular his outstanding and continuing contribution to the structural understanding of the early Palaeozoic Selwyn Block and in the understanding of sedimentary systems, structuring and tectonism in the Tertiary and Lower Cretaceous of the southern margin basins of Victoria. This has significantly contributed to new understanding and interpretation of tectonism and uplift in the Otway and Gippsland Basins and a better understanding of the tectonic framework of Victoria and its structural relationship with Tasmania.

He has excelled in fields as diverse as petroleum geology, hard rock mineralization, tectonics of the Tertiary and Cretaceous basins and the role of basement controls in southern Australia. His involvement in the discovery of the Minerva Gas Field was instrumental in re-igniting interest in the offshore Victorian basins and subsequently led to further discoveries.

Field teaching is one of his many strengths, and with characteristic passion and commitment he has guided countless students in their development of this essential skill. His former students now have positions all over the world in academia and industry.

In a career spanning 45 years, Mike has made, and continues to make, a significant and valuable contribution to our understanding of the geology, geological processes and structural setting of southern Australia – and he continues his career of outstanding teaching on southern Australian geology to students and industry workers.

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## AGM REPORTS

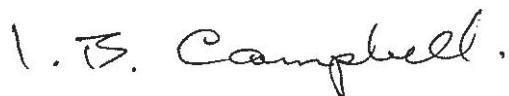
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**The 2010 Canavan Prize** was awarded to Kathryn Owen (Monash University) who achieved the highest marks for a second year student in an Earth Science related course in Victoria.

**The 2010 D. E. Thomas Medal** was awarded to Ashleigh Hood (University of Melbourne) for her honours thesis project on the newly discovered Oodnaminta Reef in the Flinders Ranges, South Australia. The reef is of Neoproterozoic (Cryogenian) age and contains evidence of pre-Ediacaran multicellular organisms. Ashleigh's project was to study the field geology and petrology of the Oodnaminta Reef. She produced a detailed map of the reef and surrounding sediments. Her mapping and petrology were considered outstanding and she gained a mark of 97% for her thesis.

The committee unanimously agreed that this project is a well integrated work that combines mapping, petrology, palaeontology and field geology data and conforms to the guidelines for the Thomas Medal.

Congratulations to all the 2010 GSA awards recipients.



Ingrid Campbell  
**Chair, Awards Committee**

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## **BICENTENNIAL GOLD 88 ENDOWMENT**

### **Report for the Year 2010**

Applications for support for tertiary students during 2011 from this Endowment in the realm of geoscience as applied to economic geology were again sought and assessed during the year.

As was the case last year, an above average number of submissions were again received, most of which were focused on research projects.

The sum of \$10,000 was again made available for distribution for the year 2011.

As usual, the total value of applications far exceeded the funds available.

As a first in the history of this Endowment, researchers of one institution, Monash University, scooped the pool!

Our congratulations go to the winners involved with the following projects:

- Ph.D. research on aspects of the mafic and ultramafic Giles Complex, including its origins and metallogenic fertility.
- Field work associated with Ph.D. research aiming to connect the pre-Carboniferous rocks of Tasmania and Victoria across Bass Strait.
- Assistance for a Ph.D. student to enable modelling of the sub-surface structures of maar volcanoes in Western Victoria to contribute to the understanding of kimberlite volcano formation

## AGM REPORTS

and distribution of diamonds within a kimberlite orebody.

- Assistance to a Ph.D. student with research costs related to a gold project in China, where any positive outcomes would potentially find application in the search for intrusion-related gold deposits in Australia.

Ms Ingrid Campbell and Prof. Chris Wilson are thanked for their contribution to the assessment process. The latter replaced Prof. David Gray, a long serving member of this Working Group, who left due to a move interstate.

We are also gratefully acknowledge the efficient secretarial support and effective promotion efforts provided by Ms Xan Weber of the AusIMM, as well as the continuing commitment to this Endowment of the Director and its Trustees

GERHARD K. KRUMMEI

Chairman – Working Group

BG88 Endowment

03.03.2011

*The Treasurer's report will be included in next month's newsletter*

Details of the new committee for 2011-12 are:

*Chair:* David Cantrill

*Secretary:* Adele Seymon

*Treasurer:* Barbara Wagstaff

*Investments:* David Moore (assisted by David Cantrill and Barbara Wagstaff)

*Newsletter editor:* Matthew Bliss

*The University of Melbourne student representative:* Matthew Bliss

*Monash University student representative:* Amir Mahmud

*Sub-committees:*

*Heritage:* Susan White

*Awards:* Ingrid Campbell

*Bicentennial Gold:* Gerhard Krummei

*Education:* Noel Schleiger

Contact details can be found on the last page

## Eugene von Guérard: Nature Revealed

Take a fresh look at Australia's most renowned landscape artist through this comprehensive exhibition, which includes many of von Guérard's beloved studies of both familiar and exotic locations. His meticulous brushstrokes and breathtaking compositions will transport you to the magnificent natural beauty of regional Victoria, Australia, New Zealand and beyond.

Open daily 10am – 5pm at The Ian Potter Centre: NGV Australia, Federation Square from 16 April until 7 August.

\$15 Adult / \$12 Concession / \$7.50 Child (ages 5–15) / Family \$42

Visit:

<http://www.ngv.vic.gov.au/whats-on/exhibitions/exhibitions/eugene-von-guerard> for further information.

Eugene von Guérard

Tea Trees near Cape Schanck, Victoria 1865

National Gallery of Victoria, Melbourne

Purchased with funds donated by Ian Hicks

AM and Dorothy Hicks, John Higgins, Bruce

Parncutt and Robin Campbell, 2006





## MEMBER CONTRIBUCTIONS

### **ANZGG (Inc.) 14th Biennial Meeting 31st January – 4th February 2011, Oamaru, New Zealand**

Shannon Burnett

Earlier this year I attended the 14th Biennial Meeting of the Australian & New Zealand Geomorphology Group Inc. in Oamaru. This was my first time attending or presenting at a conference.

I presented a paper entitled "Remnant dune systems on the Nullarbor Plain, Australia", which was one half of my honours thesis that I only completed a week before the conference. I was lucky enough to present in the last morning of the conference, the morning after the conference dinner. Despite some sore heads from the night before, I received many positive comments and helpful suggestions after my presentation.

My presentation was about how the surface of the Nullarbor is covered by an undulating landscape of ridges and swales, with four different orientations. The ridges and swales are not a result of joint control as previously stated, instead they are caused by dissolution of limestone in the swales of dune systems that since have eroded away.

The standard of the presentations at the conference was very high and topic greatly varied, ranging from Glacial to arid landscape geomorphology. The standout presentations were quite surprising, one being the business of geomorphology and the other on liquefaction after the September Canterbury earthquake. This presentation was remarkable, not only because of the earthquake and the subsequent problems with liquefaction that was to follow a few weeks after the conference, but also as the project was carried out by second year students on a summer research project and their efforts paid off as they jointly received the student prize at the conference with another student.

The mid-conference field trips were to either the Oamaru Hinterland or Mt Cook. I went on the Mt Cook trip, which focused on the glacial history, hazard management, landscape transformations and tectonic geomorphology of the Southern Alps. The highlight of the trip was definitely the walk up the terminal moraines of the Tasman Glacier, despite the rain. I would like to thank the GSAV for making it possible for me to attend this conference.



Figure 1: Mt Cook



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**STUDENT FUNDING OPPORTUNITIES**

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**Geological Society of Australia (Victoria Division) Student Research Scholarships**

The GSAV are pleased to offer up to \$10,000 per year in scholarships available to honours and postgraduate students for assistance with travel costs associated with conferences and field work.

The scholarship is valued at up to \$500 for travel within Australia and \$700 for travel outside of Australia. The number of and value of the scholarships awarded each year is made at the discretion of the GSA(Vic) committee.



Funding will not be granted retrospectively and applicants are asked to submit forms no later than 6 weeks prior to their trip to give the committee time to consider the application.

Students that receive this scholarship are required to submit a report for publication in the newsletter, "The Victorian Geologist", following their trip. A presentation may also be requested by the committee, which will consist of a short, 10-15 minute presentation prior to the monthly seminar.

Applications forms can be scanned and emailed to: [secretary@vic.gsa.org.au](mailto:secretary@vic.gsa.org.au)

or mailed to:

Geology Research Scholarships Victoria  
Geological Society of Australia (Victoria Division)  
GPO Box 2355  
Melbourne VIC 3001

More information including eligibility criteria can be found on the form and by contacting Barbara Wagstaff ([wagstaff@unimelb.edu.au](mailto:wagstaff@unimelb.edu.au))

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**Something interesting to share? Want to see your name in print?**

Don't be bashful, contribute to the GSA(V) monthly newsletter!

If there are any events, happenings, news, or views that would be of interest to the membership, please send your details and information to Matt Bliss at [mbliss@student.unimelb.edu.au](mailto:mbliss@student.unimelb.edu.au)

**We'd be glad to hear from you**

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**MEMBER CONTRIBUTIONS**

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**“What’s with all these earthquakes?”**

By Matthew Bliss

School of Earth Sciences, University of Melbourne

This question was the focus of a public seminar held at the University of Melbourne on April 13<sup>th</sup>, 2011, sponsored by the Melbourne Energy Institute, The Faculty of Science at the University of Melbourne and AuScope. Chaired by Prof. Mike Sandiford from the School of Earth Sciences, University of Melbourne, the seminar had presentations from numerous, international experts on earthquake seismology.

Prof. Kevin Furlong from the Department of Geoscience, Pennsylvania State University, discussed earthquake ‘chains’ and how one earthquake can trigger subsequent earthquakes along an active margin, as well as how geophysical techniques can map stresses on plate boundaries and how these stresses change following earthquakes. Prof. Phil Cummins from the Centre for Natural Hazards at ANU discussed that Indonesia, particularly the region surrounding Padang, was at risk of a big earthquake, and subsequent tsunami, due to stress build up at the plate margin, while Gary Gibson, a Senior Research Seismologist at the University of Melbourne explained how earthquakes cause damage and why bigger magnitude earthquakes do not necessarily cause more damage than smaller magnitude earthquakes. Lastly, Prof. Antoinette Tordesillas from the Mathematics and Statistics Department at the University of Melbourne presented some recent experimental work on how granular materials (e.g. sand, gravel) behave as stress is placed upon them and the mechanics of how these materials fail, which can cause damage to overlying structures.

The well-attended seminar was concluded by Prof. Mike Sandiford stating that while we are not yet able to predict earthquakes, our understanding on the precursors to large earthquakes, the mechanics of earthquakes, and the way in which they cause damage is continuously improving.

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**ExxonMobil****Basin Scale Play Analysis  
7<sup>th</sup> April, 2011**

ExxonMobil and the School of Geosciences, University of Monash jointly organized a one day workshop on Petroleum Fairway Analysis. More than 40 students of the school participated in the course, delivered by the Exploration team of ExxonMobil Australia.

During the day, the Petroleum Play elements (Source, Reservoir, Trap and Seal) were discussed in detail. The pick of the workshop was the Team challenge, in which the student teams were given real data, which was analysed for petroleum potential and prospects.

Not to forget, apart from the technical expertise, lunch and drinks were also provided by ExxonMobil.

Syed Amir Mahmud



## FORTHCOMING SEMINARS AND EVENTS

to be presented at  
GSA (Victoria Division) meetings

Note: unless otherwise indicated, all 2011 talks will be held in the Fritz Loewe Theatre, Earth Sciences Building, University of Melbourne.

May 26 Shannon Burnett (GSAV Student Research Scholarship Awardee)  
*"Karst features and remnant dune systems on the Nullarbor Plain, Australia"*

June 23 Royal Society of Victoria and the Geological Society of Australia  
(Victoria Division) present:

### The **ANNUAL AW HOWITT LECTURE**

**Dr Gary Gibson** Senior Research Seismologist, Earth Sciences,  
University of Melbourne  
*Talk title to be announced*

July 28 TBA

Welcome to our new  
members!

Caitlin Gionfriddo

Andre Coffa

Roysul Islam

Joshua Francis

Matej Lipar

Syed Amir Mahmud

Stephanie Mills

Sangmin Lee

Matthew McGloin

Visit the GSAV on [www.vic.gsa.org.au](http://www.vic.gsa.org.au) or the GSA on [www.gsa.org.au](http://www.gsa.org.au)

• Renewing your GSA membership is easy - it can now be done online. •

### CONSIDER CONTRIBUTING TO TAG!

It is member contributions which make TAG a member magazine – please keep the contributions coming and assist with informing all of the membership (not just your Division) about your activities.

Please send your news to: [tag@gsa.org.au](mailto:tag@gsa.org.au)



## GSA (VICTORIA DIVISION) COMMITTEE

Please address all correspondence to the GSA Victoria Division  
GPO Box 2355, Melbourne, VIC, 3001  
Internet address: [www.vic.gsa.org.au](http://www.vic.gsa.org.au)

## OFFICE BEARERS

Chair:	David Cantrill	9252 2301 (BH)
Vice-chair:	position vacant	
Secretary:	Adele Seymon	9658 4523 (BH)
Treasurer:	Barbara Wagstaff	8344 6537 (BH)

## COMMITTEE

Erin Matchan	8344 7672 (BH)
David Moore	0409 911 120
Noel Schleiger	9435 8408
Lindsay Thomas	0427 354 828
Susan White	9328 4154
Matthew Bliss	8344 9980 (BH)
Syed Amir Mahmud	9902 4206 (BH)

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Bicentennial Gold:	Gerhard Krummei	9820 2595
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Webmaster:	Lindsay Thomas	0427 354 828

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## Newsletter deadline:

First Friday of the month except Dec & Jan  
[mbliss@student.unimelb.edu.au](mailto:mbliss@student.unimelb.edu.au)

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Print Post No. PP381827/0025  
Registered Publication No. VBH 2135

If undelivered return to:  
The Geological Society of Australia Inc.  
GPO Box 2355  
Melbourne VIC 3001

PRINT POST APPROVED