

THE VICTORIAN GEOLOGIST

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May 2015

THE GEOLOGICAL SOCIETY OF AUSTRALIA
Victoria Division
Joint meeting with...

THE ROYAL SOCIETY OF VICTORIA
The 2015 Howitt Lecture:

Victoria's gemstones: more than just history

Dr Bill Birch

**President, Royal Society of Victoria
Curator Emeritus, Museum Victoria**

NOTE: Royal Society of Victoria, 8 La Trobe St. Melbourne

Light meal at 6:15 (\$20, booking required) before lecture 7:00 to 8:15 p.m.
See <http://www.royalsocietyvictoria.org.au/news-events/lecture-program/>
or call 9663 5259 for details.

Early interest in gemstones in colonial Victoria was inextricably linked to discoveries made during alluvial gold mining, when diggers routinely turned up brightly coloured sapphires and zircons in their pans and sluice-boxes. The discovery of rare diamonds heightened the excitement. Three influential men, the Rev. John Bleasdale, George Milner Stephen and George Ulrich, all members of the Royal Society of Victoria, were responsible for promoting Victorian gemstones. As President, Bleasdale organised an exhibition of colonial gemstones and jewellery, open to the public in the Society's hall, for the week ending May 6, 1865, 150 years ago this month. A few years later he proclaimed Victoria to have more rare and precious gems than any other country. Nowadays, Victoria's gemstones do little more than tease occasional diamond explorers and entice hobby fossickers, yet their very elusiveness, variability and puzzling distribution excites scientific curiosity.

In this talk, Dr Bill Birch will describe the main localities where diamonds and sapphires occur across Victoria, and illustrate the main distinguishing features of the gemstones from each field, including some of the modern investigative methods available. While seemingly isolated from each other, the Victorian gem-fields lie within the belt of diamond-sapphire-zircon fields extending from Tasmania to Queensland, suggesting they all must have some aspects of their origin in common.

SPEAKER BIO

Dr Bill Birch is Curator Emeritus at Museum Victoria, after a 40-year career as Senior Curator in geosciences (mineralogy and petrology). He has wide interests in the geological features and mineral occurrences of Victoria, and has published over 200 papers and articles on his research interests. His active involvement in professional geological and mineralogical organisations in Australia and overseas has been recognised through the awarding of the Selwyn Medal in 1999 and an Order of Australia in 2006.

APRIL MEETING

Unfortunately the advertised speaker for April, Julie Boyce, had to cancel; however, we were lucky to have **Teagan Blaikie** step in at the last minute, and her talk can be watched online via www.gsavic.org. Teagan has recently completed her Ph.D. in the fields of geophysics and volcanology at Monash University in Melbourne. Her research involves integrating geologic and geophysical data to model the internal structures of volcanoes in order to understand and link their subsurface morphology with their eruptive histories. This research is based in the Newer Volcanics Province of Western Victoria, and has implications for understanding volcanism and assessing hazards associated with a future eruption in the region.

Three-dimensional potential field modelling of the subsurface morphology of complex maar volcanoes: examples from the Newer Volcanics Province, Western Victoria

Geophysical modelling techniques are applied to examine and compare the subsurface morphology of maar volcanoes within the Newer Volcanics Province to better understand their eruptive histories and the hazards associated with future eruptions within the province. High-resolution ground gravity and magnetic data were acquired across several maar volcanoes, including the Ecklin maar, Red Rock Volcanic Complex, and Mount Leura Volcanic Complex and the Anakie maar. The depth and geometry of subsurface volcanic structures were determined by interpretation of gridded geophysical data, and constrained 2.5D forward and 3D inverse modelling techniques. Bouguer gravity lows identified across the volcanic craters reflect lower density lake sediments and pyroclastic debris infilling the underlying maar-diatremes.

These anomalies were reproduced during modelling by shallow coalesced diatremes. Short-wavelength positive gravity and magnetic anomalies identified within the center of the craters suggest complex internal structures. Modelling identified feeder vents, consisting of higher proportions of volcanic debris, intrusive dykes, and ponded magma. Because potential field models are non-unique, sensitivity analyses were undertaken to understand where uncertainty lies in the interpretations, and how the models may vary between the bounds of the constraints. Rather than producing a single 'ideal' model, multiple models consistent with available geologic information are created using different inversion techniques. The modelling technique we present focuses on maar volcanoes, but there are wider implications for imaging the subsurface of other volcanic systems such as kimberlite pipes, scoria cones, tuff rings and calderas.

AUSTRALIAN EARTH SCIENCES CONVENTION NEWS



Uncover Earth's Past to
Discover Our Future

26 - 30 June 2016 – Adelaide Convention Centre

aesc2016.gsa.org.au

Call for AESC theme and session suggestions

An exciting series of themes, symposia, fieldtrips and workshops is being put together by the AESC 2016 Organising Committee.



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A preliminary taste of what is to come and who to contact if you want to make suggestions is outlined below.

- Earth's Environment** – Past to Present
- Tectonics of the Earth and Other Planets** – Craton and Continental Formation and Evolution, Ocean Plate Tectonics, Plate Margin and Plate Interior Tectonism
- Deep Earth Geodynamics** – Core, Asthenosphere and Lithosphere Dynamics, Coupling the Dynamic Deep Earth with Surface Tectonics
- Mineral Endowment** – Formation and Exploration of Mineral Deposits, their Tectonic and Geochemical Environment and Significance
- Geoscience for Society** – Geotourism, Education, Integration and Translation of Earth Sciences for Societal Benefit, Open the Gate, Geoscience and Community Engagement
- The Earth Science of Energy** – From Hydrocarbons to Hot Rocks

Committee

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PHOTO: Pleistocene sediments of the Hindmarsh Clay (red) and unconformably overlying Bridgewater Formation (white) in cliff exposures at Balgowan, Yorke Peninsula, South Australia. Photo courtesy of Caroline Forbes

www.aesc2016.gsa.org.au

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

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.

**Eligibility**

Applicants must be members of the GSA and enrolled in a full-time degree at a Victorian Tertiary institution and undertaking research in Geology. The scholarship will be awarded to assist with conference travel for honours and postgraduate students, who are presenting (either poster or talk) at the conference.

Honours and postgraduate students that receive this scholarship will be required to submit a report for publication in 'The Victorian Geologist' newsletter following to 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.

Students who have previously received a GSAV research scholarship are not eligible. Scholarships and bursaries from other sources are acceptable.

Applications forms can be scanned and emailed to: 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 can be found by contacting Barbara Wagstaff (wagstaff@unimelb.edu.au)

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 Kieran Iles at kiles@student.unimelb.edu.au

We'd be glad to hear from you

FORTHCOMING SEMINARS AND EVENTS

to be presented at
GSA (Victoria Division) meetings

Note: unless otherwise indicated, all 2015 talks will be held in the
Fritz Loewe Theatre, Earth Sciences Building, University of Melbourne.

May 28th:

Howitt Lecture: Bill Birch

Victorian gemstones; more than just history

July 30th:

Monthly Meeting: Students Night

Later this year (watch this space!):

Ken Grimes (August) - Northern Australian sandstone pseudokarsts

Helen Green - Dating Aboriginal Rock Art

Please welcome our newest members



Visit the GSAV on www.gsavic.org or the GSA on 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

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