

THE VICTORIAN GEOLOGIST



November 2011

THE GEOLOGICAL SOCIETY OF AUSTRALIA
Victoria Division

Next General Meeting

Thursday 24th November at 6:15 p.m.

**Martian Mineralogy:
What we now know that we didn't before**

**Marion Anderson
School of Geosciences, Monash University**

Fritz-Loewe Theatre, School of Earth Sciences, The University of Melbourne
Preceded at 5:30 p.m. by drinks and nibbles in the tea room, 4th floor. Cost \$2

For almost eight years two rovers, Spirit and Opportunity, have been exploring the surface of Mars, supported by a flotilla of orbiters. Their investigations and findings have changed the way we see Mars. From what appeared to be a dead and dry planet we now know that Mars has been very different in the past, and we are just now beginning to see hints of a much more dynamic planet than ever before. This presentation, given by a member of the Mars Exploration Program Advisory Group, will bring you up to date on the latest findings, and give you a preview of the next Mars rover mission - Curiosity - that launches the day after this talk!

A MESSAGE FROM THE GSAV

This is the last issue of TVG for 2011. The GSAV would like to thank all speakers for the insightful and informative talks we've had throughout the year and wish all members a safe and enjoyable holiday period. We look forward to welcoming you all back in 2012.

As a final note, most of you will be aware of the speculation that 2012 will be the final year of humanity, ending in the cataclysmic destruction of the Earth and life as we know it. To help allay some fears this month's newsletter features a couple articles on the events suggested to cause this annihilation. Hopefully they can provide some reassurance to all that 2012 can be enjoyed without the nagging fear that it was all for nothing.

EARTH SCIENCE WEEK

Earth Science activities at Darley Primary School, Bacchus Marsh

Susan White

The committee of management of the Council Trench Geological Reserve is always keen to promote earth sciences in the local area. Over the years we have run various activities during Earth Science Week and this year decided we would offer some activities at a local school.

Darley Primary School is a large state primary school in northern Bacchus Marsh where the science room looks out on a view of the Permian sediments of Bald Hill. The school has a dedicated science room and teacher, and all students have a targeted science class each week. It is clear from the material around the room that often these activities include earth science based work.

Two members of the Management committee, Susan White and Bob Reid spent the morning of Friday 14th October discussing the rocks of the Bacchus Marsh area with two grades of 5/6 students. We were able to borrow enough samples of suitable Ordovician shales (with graptolites), Permian tillite, Triassic sandstone, and Pleistocene basalt to be able to engage the students in observation, discuss the differences between the rocks and where they are found around Bacchus Marsh.

Great co-operation and enthusiasm from the students made the whole morning great fun. Thanks to Rohan Caitlin for access to his classes. With any luck the students will have acquired some insight into geology!

SUPERVOLCANOES: NOT A THREAT FOR 2012

Science Daily Nov. 15, 2011 (www.sciencedaily.com)

The geological record holds clues that throughout Earth's 4.5-billion-year lifetime massive supervolcanoes, far larger than Mount St. Helens or Mount Pinatubo, have erupted. However, despite the claims of those who fear 2012, there's no evidence that such a supereruption is imminent. What exactly is a "supervolcano" or a "supereruption?" Both terms are fairly new and favored by the media more than scientists, but geologists have begun to use them in recent years to refer to explosive volcanic eruptions that eject about ten thousand times the quantity of magma and ash that Mount St. Helens, one of the most explosive eruptions in recent years, expelled.

It's hard to comprehend an eruption of that scope, but Earth's surface has preserved distinctive clues of many massive supereruptions. Expansive layers of ash blanket large portions of many continents. And huge hollowed-out calderas -- craters that can be as big as 60 miles (100 km) across left when a volcano collapses after emptying its entire magma chamber at once -- serve as visceral reminders of past supereruptions in Indonesia, New Zealand, the United States, and Chile. The eruption of these prehistoric supervolcanoes has affected massive areas. The magma flow of Mount Toba in Sumatra, which erupted some 74,000 years ago in what was likely the largest eruption that has ever occurred, released a staggering 700 cubic miles (2,800 cubic km) of magma and left a thick layer of ash over all of South Asia. For comparison, the quantity of magma erupted from Indonesia's Mount Krakatau in 1883, one of the largest eruptions in recorded history, was about 3 cubic miles (12 cubic km).

Volcanologists continue to seek answers to many unanswered questions about supervolcanoes. For example, what triggers their eruptions, and why do they fail to erupt until their magma chambers achieve such enormous proportions? How does the composition compare to more familiar eruptions? And how can we predict when the next supervolcano will erupt? But there's one thing that all experts agree on: supereruptions, though they occur, are exceedingly rare and the odds that one will occur in the lifetime of anybody reading this article are vanishingly small.

The most recent supereruption occurred in New Zealand about 26,000 years ago. The next most recent: the cataclysmic eruption of Mount Toba happened about 50,000 years earlier. In all, geologists have identified the remnant of about 50 supereruptions, though teams are in the process of evaluating a number of other possibilities. That may sound like a large number. However, when one group of scientists used the count of all the known supervolcanoes to calculate the approximate frequency of eruptions, they found that only 1.4 supereruptions occur every one million years. That's not to say that a supervolcano will occur every million years at regular intervals. Many millions of years could pass without a supereruption or many supervolcanoes could erupt in just a short period. The geological record does suggest supervolcanoes occur in clusters, but the clusters are not regular enough to serve as the basis for predictions of future eruptions. Scientists have no way of predicting with perfect accuracy whether a supervolcano will occur in a given century, decade, or year -- and that includes 2012. But they do keep close tabs on volcanically active areas around the world, and so far there's absolutely no sign of a supereruption looming anytime soon.

2012: KILLER SOLAR FLARES ARE A PHYSICAL IMPOSSIBILITY, EXPERTS SAY

Science Daily Nov. 11, 2011 (www.sciencedaily.com)

Given a legitimate need to protect Earth from the most intense forms of space weather -- great bursts of electromagnetic energy and particles that can sometimes stream from the sun -- some people worry that a gigantic "killer solar flare" could hurl enough energy to destroy Earth. Citing the accurate fact that solar activity is currently ramping up in its standard 11-year cycle, there are those who believe that 2012 could be coincident with such a flare. But this same solar cycle has occurred over millennia. Anyone over the age of 11 has already lived through such a solar maximum with no harm. In addition, the next solar maximum is predicted to occur in late 2013 or early 2014, not 2012. Most importantly, however, there simply isn't enough energy in the sun to send a killer fireball 93 million miles to destroy Earth.

This is not to say that space weather can't affect our planet. The explosive heat of a solar flare can't make it all the way to our globe, but electromagnetic radiation and energetic particles certainly can. Solar flares can temporarily alter the upper atmosphere creating disruptions with signal transmission from, say, a GPS satellite to Earth causing it to be off by many yards. Another phenomenon produced by the sun could be even more disruptive. Known as a coronal mass ejection (CME), these solar explosions propel bursts of particles and electromagnetic fluctuations into Earth's atmosphere. Those fluctuations could induce electric fluctuations at ground level that could blow out transformers in power grids. The CME's particles can also collide with crucial electronics onboard a satellite and disrupt its systems. In an increasingly technological world, where almost everyone relies on cell phones and GPS controls not just your in-car map system, but also airplane navigation and the extremely accurate clocks that govern financial transactions, space weather is a serious matter.

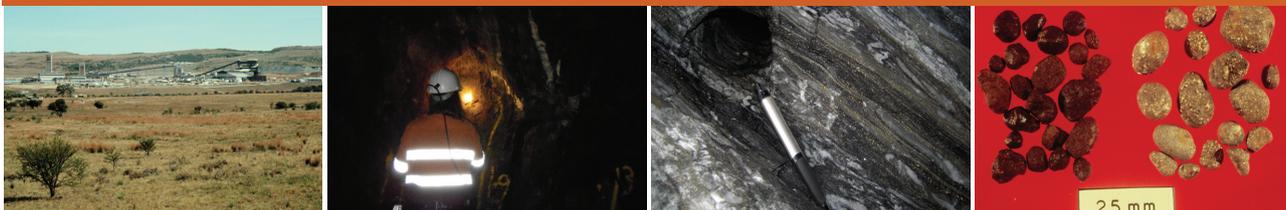
But it is a problem the same way hurricanes are a problem. One can protect oneself with advance information and proper precautions. During a hurricane watch, a homeowner can stay put . . . or he can seal up the house, turn off the electronics and get out of the way. Similarly, scientists at NASA and NOAA give warnings to electric companies, spacecraft operators, and airline pilots before a CME comes to Earth so that these groups can take proper precautions. Improving these predictive abilities the same way weather prediction has improved over the last few decades is one of the reasons NASA studies the sun and space weather. We can't ignore space weather, but we can take appropriate measures to protect ourselves.

And, even at their worst, the sun's flares are not physically capable of destroying Earth.

Geology of GOLD course

19-23 March 2012

School of Earth Sciences, University of Melbourne



This is a 5-day course of lectures, practical sessions and a field trip, devoted to the Geology of Gold.

It is suitable for geologists in the mineral industry or government with early exploration or mining experience who want a broad coverage of gold geology as well as some of the latest research ideas and how they apply to mineral exploration.

The course also serves as an Honours and Postgraduate course for students interested in entering the mineral industry. Interaction between the various groups of participants has become a much-valued feature of the week since this course was first run in 1995.

The course covers all major types of gold deposits with emphasis on Archaean deposits of Western Australia and slate-belt deposits of the Victorian gold province. Porphyry, epithermal, Carlin and Witwatersrand gold are all covered, with discussion of current ideas on each. An overnight field trip takes participants through the heart of the Victorian gold province visiting several past producers and some new operations.

Geochemistry, structural geology, metamorphic petrology, regolith and deposit geology are covered at a level to enable participants to take their place in industry and government teams and make a contribution in all of these areas. An emphasis of the course is on a holistic approach that uses all applicable fields of geology to address gold issues.

COURSE LEADER: Professor Neil Phillips

PRESENTERS INCLUDE: Dr Martin Hughes, Dr Andrew Tomkins, Professor Janet Hergt, Jonathan Law, Professor Roger Powell and Dr Iain Pitcairn.

COST FOR INDUSTRY PARTICIPANTS: AUD\$750 that includes overnight field trip. Numbers will be limited due to the field component, and registrations are likely to close early.

REGISTRATION: Kerry Grieser, School of Earth Sciences, University of Melbourne
+61 3 8344 9866, Fax: +61 3 8344 7761; kerryh@unimelb.edu.au

STUDENT FUNDING OPPORTUNITIES

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

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)

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

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 2011 talks will be held in the
Fritz Loewe Theatre, Earth Sciences Building, University of Melbourne.

NO MORE SEMINARS FOR 2011

SEE YOU IN 2012

Please join the GSAV in welcoming these new members

Jill Lynch



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



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

OFFICE BEARERS

Chair: David Cantrill 9252 2301 (BH)
Vice-chair: James Llorca 9670 3410 (BH)
Secretary: Adele Seymon 0403 269 462
Treasurer: Barbara Wagstaff 8344 6537 (BH)

COMMITTEE

David Moore 0409 977 120
Noel Schleiger 9435 8408
Lindsay Thomas 0427 354 828
Susan White 9328 4154
Matthew Bliss 8344 9980 (BH)
Syed Amir Mahmud 9902 4206 (BH)
Helen Green 8344 7672 (BH)

SUBCOMMITTEE

CONTACTS

Awards: Ingrid Campbell 9486 7160
Bicentennial Gold: Gerhard Krummei 9820 2595
Education: Noel Schleiger 9435 8408
Heritage: Susan White 9328 4154
Newsletter: Matthew Bliss 8344 9980
Webmaster: Lindsay Thomas 0427 354 828

OTHER CONTACTS

Geology of Victoria: Bill Birch 9270 5049 (BH)

Newsletter deadline:

First Friday of the month except Dec & Jan
mbliss@student.unimelb.edu.au

GSA Inc - for membership and subscription enquiries or change of address:
Business Office: Geological Society of Australia, Suite 61, 104 Bathurst Street, Sydney NSW 2000
Email: info@gsa.org.au Tel: (02) 9290 2194 Fax: (02) 9290 2198

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