



# Mineralogical Society of Western Australia Inc. May 2014 Newsletter

## Editorial

Stewart Cole donated the March door prize of a chialtolite crystal that was won by John Mill.

The policy that members may submit short adverts free of charge will remain. Additionally, it was agreed that other commercial advertisements would be accepted for a nominal charge.

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## Recent Activities

### **General Meeting held on 19<sup>th</sup> March 2014.**

The General Meeting of the Mineralogical Society of Western Australia Incorporated was on Wednesday 19<sup>th</sup> of March 2014 at the WA Lapidary Club rooms located at 31, Gladstone Road, Rivervale (corner of Newey St).

The General Meeting was followed by a talk on "Fossil Sharks" by Mikael Siverson, a paleontologist with the Earth and Planetary Sciences Department at the Western Australian Museum.

Mikael discussed a particular group of sharks, the lamniform sharks that were the apex predators in the oceans for a long period of time. There are 8 or 9 orders of modern sharks, including lamniform sharks; examples of these include the great white shark, the grey nurse shark and the megamouth shark.

Because sharks are cartilaginous, skeletal fossil remains tend to be rare and much of the paleontological work is completed on shark teeth which can occur in abundance.

A shark tooth has two main components, a hard enamel-like shiny layer that covers the crown and a bone-like tissue called dentine that forms the root-like base and fills the inside of the crown. This 'root' structure is easily degraded by scraping and boring organisms as the shed tooth lies exposed on the seafloor before it is covered by clay or sand, but as studies show, when well-preserved, the base of the tooth is highly diagnostic in megatooth sharks.

The Alinga Formation and Gearle Siltstone in the late Cretaceous of the elongated 1100 km-long Carnarvon Basin of Western Australia contain a prolific number of shark teeth. For example, the uppermost beds of the Alinga Formation and the basal part of the overlying Beedagong Claystone in the lower Murchison River area at the southern end of the Southern Camarvon Basin, Western Australia, have yielded 15 species of lamniform sharks referred to ten genera, of which one genus and three species are new.

Dr Siverson says sharks were replaced as the oceans' apex predators about 80 million years ago, by huge extinct marine reptiles called Mosasaurs that out-competed sharks for about 15–20 million years, before dying out with most other dinosaurs.

Sharks, which were only 3–5m long, then grew until the largest ever shark, *Carcharocles megalodon*, became the top predator. A fossil megalodon tooth, collected at the Cape Range, WA, was dated as being approximately 18 million years old. The tooth measures 12 cm in height and is the largest fossil shark tooth found in Western Australia. Megalodon sharks probably preyed predominantly on baleen whales as adults and are thought to have reached 18 metres in length, dwarfing contemporary shark species.

Megalodon died out two million years ago when its principal prey, whales, migrated to polar waters as the oceans cooled. Killer whales (*Orcinus orca*) that could withstand colder waters then doubled in size to occupy the top predator niche.

A more comprehensive report on the rise of super predatory sharks by Mikael Siverson can be viewed on the following website:

<http://museum.wa.gov.au/explore/videos/rise-super-predatory-sharks>

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### **Future Meetings**

There has been a change to the previously advertised timetable of speakers.

#### **General Meeting on 21<sup>st</sup> May 2014.**

Dr. Yulia Uvarova (CSIRO) will talk about the “Kola Superdeep Borehole, Kola Peninsula”.

The talk will give a flavour of what the Kola Superdeep Borehole, the deepest drill hole ever drilled into the Earth's crust, revealed about mineralogy, petrology and fluid evolution of the upper to middle crust.

Yulia graduated from the Faculty of Geology, Moscow State University with a BSc (Hons) in Geology in 2001, and from the Department of Geological Sciences, University of Manitoba with a PhD degree in 2008.

Her dissertation work was in the field of mineralogy, petrology and geochemistry of rocks from the Kola Superdeep Borehole. The Kola Superdeep Borehole (KSDB), located in the north-western part of Kola Peninsula, Russia, is the deepest hole drilled into the Earth's crust. Its depth is 12.2 km, and thus the KSDB provides an opportunity to study the upper and middle crust. Yulia examined the crystal chemistry of amphiboles and related their chemical composition and crystal chemistry to lithology and metamorphic grade of Kola Precambrian rocks. The results of her work contributed to the fields of mineralogy and metamorphic petrology. While working on her dissertation, Yulia was very fortunate to be also involved in a number of projects on identification of new mineral species, and described 8 new minerals.

After graduation from the University of Manitoba, Yulia undertook a research position at Queens' University, Canada, where her research focused on geochemistry, mineralogy, petrology and genesis of economic mineral deposits, uranium in particular; development of new exploration tools for search of U deposits; behaviour of HFSE in high-temperature systems; geochemistry of non-traditional isotopic systems and application of these systems to elucidate processes responsible for deposit formation.

Yulia moved to Australia in 2012 to start a Geochemist / Exploration Geochemist position in CSIRO, Minerals Down Under Flagship. Currently, She works in a team of researchers developing new workflows and techniques for mapping the distal footprints of metalliferous mineral systems through drilling and sampling and developing the science of understanding large geochemical footprints of mineral systems and their detection on the surface.

#### **General Meeting on 16<sup>th</sup> July, 2014.**

Dr. Steve Barnes, CSIRO, will talk on "Nickel sulphide ores: new insights from new (and old) research techniques".

New analytical techniques including 3D imaging of microtextures, grain scale x-ray fluorescence mapping and laser ablation ICPMS, combined with old fashioned petrography, are delivering new insights into the mineralogy and origin of magmatic nickel sulfide ores.

#### **Annual General Meeting on 17<sup>th</sup> September, 2014.**

Marcus Sweetapple will talk on "Triplite, Triphylite, Triploidite; to Trip the Phosphate 'Lite' Fantastic".

#### **General Meeting on 19<sup>th</sup> November, 2014.**

Dr. Kirsten Rempel, Curtin University, will talk on gold transport in hydrothermal fluids.

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## **Proposed Change of Time of General Meeting**

Following on from discussions at the 19<sup>th</sup> March General Meeting concerning the time of meeting nights, it was agreed that the meeting night be changed to the 2<sup>nd</sup> Wednesday of uneven months. This would commence with the General Meeting scheduled for 14<sup>th</sup> January 2015.

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### **Items of Interest**

John Mill has compiled a list of books and other publications that comprise the Society's library. These are currently stored at 15 Colin Grove, West Perth and can be accessed by arrangement with Stewart Cole.

The full list is appended to this newsletter.

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### **New Members**

David Sheumack and Brian Griffith applied for membership; the Committee approved both applications on 15<sup>th</sup> March.

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### **Wanted – Wanted**

CSIRO Minerals Down Under Flagship has a research team which conducts pure single mineral flotation studies. The aim is to determine the best physical and chemical conditions to separate minerals, especially impurity minerals containing arsenic and/ or bismuth, in copper and gold mineral processing. We have used up all our stocks from the 60's and 70's of pure minerals and have been unable to source high quality single minerals from commercial sources. We are urgently seeking five hundred gram to one kilogram quantities of the following minerals:

- (i) Enargite (copper arsenic sulphide;  $\text{Cu}_3\text{AsS}$ )
- (ii) Tennantite (copper arsenic sulphide;  $\text{Cu}_{12}\text{As}_4\text{S}_{13}$ )
- (iii) Tetrahedrite (copper antimony sulphide;  $(\text{Cu}, \text{Fe})_{12}\text{Sb}_4\text{S}_{13}$ )
- (iv) Bismuthinite (bismuth sulphide;  $\text{Bi}_2\text{S}_3$ ) – (any quantity at all as we have none)
- (v) Digenite (copper sulphide :  $\text{Cu}_9\text{S}_5$ )

CSIRO would like to buy these minerals from suppliers in the Mineralogical Society if the minerals are available. CSIRO's research in this is for the advancement of science and any efforts to limit the price of these minerals will be very much appreciated. CSIRO would be happy to share the results of the chemical and physical analyses to the suppliers if that is of interest. CSIRO would also be happy to acknowledge suppliers in any journal publications from this work.

Please contact:

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### **Committee Meeting**

The next Committee Meeting will be held at 15 Colin Grove, West Perth on Saturday 17<sup>th</sup> May, 2014 at 10am.

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### **Volunteer Required**

The Newsletter Editor will be away for six weeks commencing 31<sup>st</sup> May and a volunteer is required to compile the July newsletter. Could anybody interested please contact the editor as soon as possible?

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### **Field Trips**

#### **Western Australia Lapidary and Rockhunting Club Inc.**

By arrangement, members of the Mineralogical Society are able to go on field trips organized by the Western Australia Lapidary and Rockhunting Club Inc. If you are interested in attending these field trips please put your name on the notice board at the Lapidary and Rockhunting Club for the relevant field trip.

Please register with Minsocwa Field Trip organizers prior to attending any of the field trips to confirm event details.

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### **Committee Members**

The following are the committee members.

Committee Members	
Stewart Cole - President ph 0414 904 169	Nimal Perera - Social Officer/Field Trips Leader
Sue Koepke - Secretary ph 0417 990 688	Vernon Stocklmayer-Newsletter Editor ph 9291 9043
John Mill – Treasurer ph 0411420921, 9293 4664.	Ida Newton
Geert Buters - Vice President	
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