

National Rock Garden

Celebrating the Geological Heritage of Australia

Newsletter No. 11
September 2015

Recent Developments

Delivery of Banded Iron Formations and Orbicular Granites

Australian Landscapes –Maria Island, Tasmania

Making a Bequest

Working Bee and picnic



The National Rock Garden is proudly supported by the Geological Society of Australia and the Australian National University



**Australian
National
University**

www.nationalrockgarden.org.au

Recent developments: New rock acquisitions for the NRG

Brad Pillans, Chair of the NRG Steering Committee

In February this year, I was contacted by the German Embassy, in Canberra. “Would I be able to meet with a Mr Wolfgang Kraker von Schwarzenfeld regarding a potential display of rocks, in Canberra, for a project known as the Global Stone Project”? I was intrigued, and agreed to do so. The outcome of that meeting, which resulted in the acquisition of 7 new, spectacular rock specimens for the NRG is described by Mike Smith, later in this Newsletter.

Then, in late March, I was alerted to the possibility of making an application for Federal funding to assist in acquisition of rocks for the NRG, through what is known as the National Cultural Heritage Account (NCHA), administered through the Ministry for the Arts in the Attorney General’s Department. The NCHA is established under section 25 of the *Protection of Movable Cultural Heritage Act 1986*, for the purpose of ‘facilitating the acquisition of Australian protected objects for display or safe-keeping’. Australian cultural organisations such as museums, art galleries and libraries are eligible to apply for funding assistance to keep Australian protected objects in Australia and to display them in public collections, in perpetuity.

The NRG had been planning, for some time, to bring two culturally significant rocks to Canberra for display at the NRG – an alunite-bearing rock from Bulahdelah in NSW and a chrysoprase-bearing rock from Marlborough in Qld – but funding the transport costs had proved elusive. To cut a long story short, we applied to the NCHA and I am pleased to announce that our application was successful - we received official confirmation in a letter dated 15 June 2015, from Senator George Brandis, Minister for the Arts.



Photo: The 16 tonne chrysoprase-bearing boulder being moved from the mining lease in the Marlborough area.

National Rock Garden – Newsletter No. 11

Bulahdelah alunite

From the 1850's Bulahdelah was a centre for timber cutting, but in 1876, after bushfires burnt through the area, a local mill worker notice a brilliant white powder in a burnt out stump hole on Bulahdelah Mountain (later called Alum Mountain). Government geologists were called in and confirmed the presence of unusually large quantities of alunite, an aluminium potassium sulphate mineral, previously known, in Europe, as a valuable source of alum. In 1878, the Australian Alum Company began mining the alunite and in 1890 works were established at Bulahdelah for the production of alum and aluminium sulphate. Most of the production was exported to England where it was processed for use in the textile industry. In 1917, the deposit was reported as the largest above-ground deposit of alunite in the world. Mining continued off and on until 1952, having extracted 73,000 tonnes of ore. In 2007, construction of a four lane Pacific Highway bypass of Bulahdelah township was approved, and opened in 2013. During construction of the bypass, a large (about 7 t) alunite-bearing boulder was recovered and retained by the Bulahdelah Historical Society, who then offered to donate it to the NRG, with support of the local traditional owners, the Worimi people. This is the specimen that will be brought to Canberra with our grant from the NCHA.



Photo: Kevin Carter and Irene Worth, both members of the Bulahdelah Historical Society, with the 7 tonne alunite-bearing rock that has been donated to the NRG.

Image courtesy the Bulahdelah Historical Society

National Rock Garden – Newsletter No. 11

Marlborough chrysoprase

The Marlborough area of Queensland is renowned for gem-quality chrysoprase, a semi-precious form of microcrystalline quartz whose rich green colour comes from trace amounts on nickel. In the Marlborough area, about 100 km northwest of Rockhampton, the chrysoprase forms from weathering of ultrabasic rocks such as serpentine, which are the source of the nickel. We have been fortunate to obtain a large (16 t) chrysoprase-bearing boulder, generously donated to the NRG by Jim and Jenny Elliot of Coolamon Mining, who previously owned a mining lease in the area. The specimen contains a significant amount of chrysoprase, which will be brilliantly displayed when we cut and polish a face of the boulder.

Both rock specimens will be transported to Canberra over the coming months and stored until the NRG site is prepared for their final display. The NRG Steering Committee would love to hear from any readers who can identify other historically significant rock specimens that could be displayed at the NRG.

Delivery of Banded Iron Formations and Orbicular Granites

Mike Smith, NRG Director

The National Rock Garden has recently received seven spectacular rock specimens in Canberra. The NRG site is not ready to receive such large specimens, so an arrangement was reached with the Geoscience Australia TimeWalk Committee to place these rocks at their correct time positions within the TimeWalk suite of rocks. The sequence of events leading to this rock delivery is summarised below.

First News and Inspection of the Rocks

During ongoing consultations about the NRG Masterplan goals, staff of the National Capital Authority (NCA) advised that a German citizen, Mr Wolfgang Kraker von Schwarzenfeld, was seeking approval to place some large rocks near the foreshore of Lake Burley Griffin, as one element of his Globalstone Peace Project. The NCA could not accept these rocks under its guidelines, so the request was discussed with the NRG Steering Committee, which learned that Wolfgang had been attempting to get permission to place at least one very large rock in the Canberra City precinct for some 20 years.

In February this year, Brad Pillans met with Wolfgang at the NRG site and discussed the possibility of incorporating the rocks into the NRG, there being two large banded iron formations located at a quarry in NSW and five polished specimens of orbicular granite stored at a truck operation in Queensland. Mike Smith travelled to the quarry near Gosford to inspect the BIFs, while Ian Withnall inspected the granite blocks at Richlands in the southwest of Brisbane. Both reported very positively on the significance of the rocks and their suitability for the NRG. An agreement was reached with Wolfgang where he would arrange for a B-Double truck to load the granites in Brisbane, travel overnight to Gosford, pick up the 2 BIFs, and continue on to Canberra, while the NRG and GA would arrange for the unloading of the rocks in the grounds of GA.

Description of the Rocks

The two *Banded Iron Formation* rocks were originally one piece that was sourced from Hamersley Iron's Mt. Tom Price mine in the Pilbara and came from the 2.5 billion-year-old Joffre Member of the Brockman Iron Formation. During this time, the oceans were more iron-rich and were inhabited by photosynthetic bacteria that caused the precipitation and settling of layers of iron oxide amongst other sediments. This process gave rise to the 'banded' pattern in the rocks.

National Rock Garden – Newsletter No. 11

Banded iron formations are one of the most important precursors to the formation of economic sources of iron ore. During the Paleoproterozoic Era, around 2 billion years ago, silica and carbonate were removed from the banded iron formations leaving behind enriched iron ore (Laurie, 2013, p.16).



Mike Smith and Wolfgang Kraker von Schwarzenfeld at the quarry site in Gosford.



Orbicular granite slab at trucking station SW of Brisbane. Image courtesy Ian Withnall

National Rock Garden – Newsletter No. 11

The **Orbicular Granite** blocks were donated to Wolfgang from the Jones family's commercial quarry on Boogardie Station located 35 km west of Mount Magnet in W.A. These specimens are from the Mangataha Granite and the age has been measured at 2686 ± 5 million years. This unusual form of granite is one of the few orbicular granite localities known worldwide (Fetherston, 2010). The pink, medium-grained, late Archaean granite contains abundant orbicules of spectacular appearance, being ellipsoidal, black and white in colour and concentrically banded. It is thought that these orbicules formed by progressive crystallisation of minerals from a fluid-rich, super-cooled magma of dioritic composition as described in TAG Number 166 (Fetherston, 2013).

The beautiful polishing of the five orbicular granites was achieved by Wolfgang using commercial services which he had located in Indonesia. After polishing the slabs were returned to Perth, and later trucked to Brisbane.

About Geoscience Australia's Geological TimeWalk

The TimeWalk is a physical representation of geological time in the landscaped gardens of the national geoscience facility. The TimeWalk leads the observer on a 1.1 kilometre journey through the Earth's 4600 million year (4.6 billion year) history and represents the evolution of the Earth from its formation through to the present day.

Since the TimeWalk's installation in the building in Canberra in 2009, large rock samples have been collected from around Australia and put on display at locations along the TimeWalk that reflect their age. Each rock has a story to tell, with geological, economic, environmental and/or cultural significance.

The Timewalk Committee kindly agreed to receive the BIF and granite slabs and prior to the arrival of the new rocks, committee members had marked out the appropriate positions along the TimeWalk path for the placement of both the granites and the BIFS.



Unloading from the semi-trailer at Geoscience Australia (photo Brad Pillans)

National Rock Garden – Newsletter No. 11

Delivery of the Rocks

The collection of the rocks in Richlands, the overnight travel to Gosford and the collection of the BIFs the next morning all went smoothly. That afternoon, a crane was contracted to meet the flat-bed semi-trailer at the GA grounds, as shown in the accompanying photographs.



Unloading at Geoscience Australia and placing the Banded Iron Formation.

About the Donor and the Globalstone Project

Wolfgang Kraker von Schwarzenfeld is an artist, adventurer, philosopher and philanthropist who has lived in many countries and also, for an extended period, on the high seas. He is the individual who conceived the Globalstone Project, searched the world for spectacular rocks, arranged transportation of large rocks to Germany, achieved the allocation of a portion of land within Berlin's famous Tiergarten and gained support of the local Mayor for the council to maintain the site. Wolfgang has acquired large rocks from five countries representing the five continents of the Earth which host major human populations (hence no stone was collected from Antarctica). Each of the rocks has a highly polished surface and the rocks are placed in a rough circle. The installation of the rocks in the Tiergarten enables sunlight to be reflected from the polished surface of each stone in a generally horizontal direction. Once a year, on the 21st of June, the sunlight from one rock reflects directly towards its adjacent rock, and the sunlight striking that second rock is reflected towards its adjacent rock. Light is similarly reflected from the third to the fourth, from the fourth to the fifth and from the fifth back to the first. Thus, each rock receives illumination from another rock so there is a linking of the five rocks from five continents. Wolfgang proposes that the linking of the stones by sunlight could be taken by the viewer to symbolise the inevitable unity of mankind. His vision is to use spectacular natural rocks to create a circular representation of humanity joined in harmonious enlightened endeavour.



Wolfgang working on polishing the faces of the 2 BIFs in the Geoscience Australia TimeWalk. Image courtesy Mike Smith

While the primary focus of the Globalstone Project is the group of rocks transported and carefully placed in the Tiergarten in Berlin, Wolfgang has ensured an ongoing association with the source countries of these big rocks. In acquiring each specimen, he always ensured that a comparable rock stayed in the source country. The locations of the source country rocks, the countries and their respective continents, are Caracas, Venezuela (the Americas), Thimpu, Bhutan (Asia), Canberra (Australia), Cape Town (Africa) and Aramilw in the Ural Mountains of Siberia (Europe). These stones are positioned to reflect sunlight back into the sky. The orientation is such that once a year, on the 21st of June in each country, the reflected light is transmitted from the polished face of the stone directly back to the sun. The NRG Steering Committee has agreed to place the BIF specimens at the inclinations and declinations requested by the donor of these rocks to achieve the sunlight reflection at the summer and winter solstices. The positioning of these rocks within the NRG has not been finalised, but will be at the discretion of the Steering Committee.

Currently resident in Berlin, Wolfgang has recently published his world philosophy in German and Spanish and the book is available as an e-Book or as a paperback at www.amazon.de - The title in German is "Frieden ist möglich: Fünf Schritte zu globalem Bewusstsein und Frieden" (German Edition, Oct 26, 2014). The title in English is "Peace is possible, Five steps to a global awareness and peace"

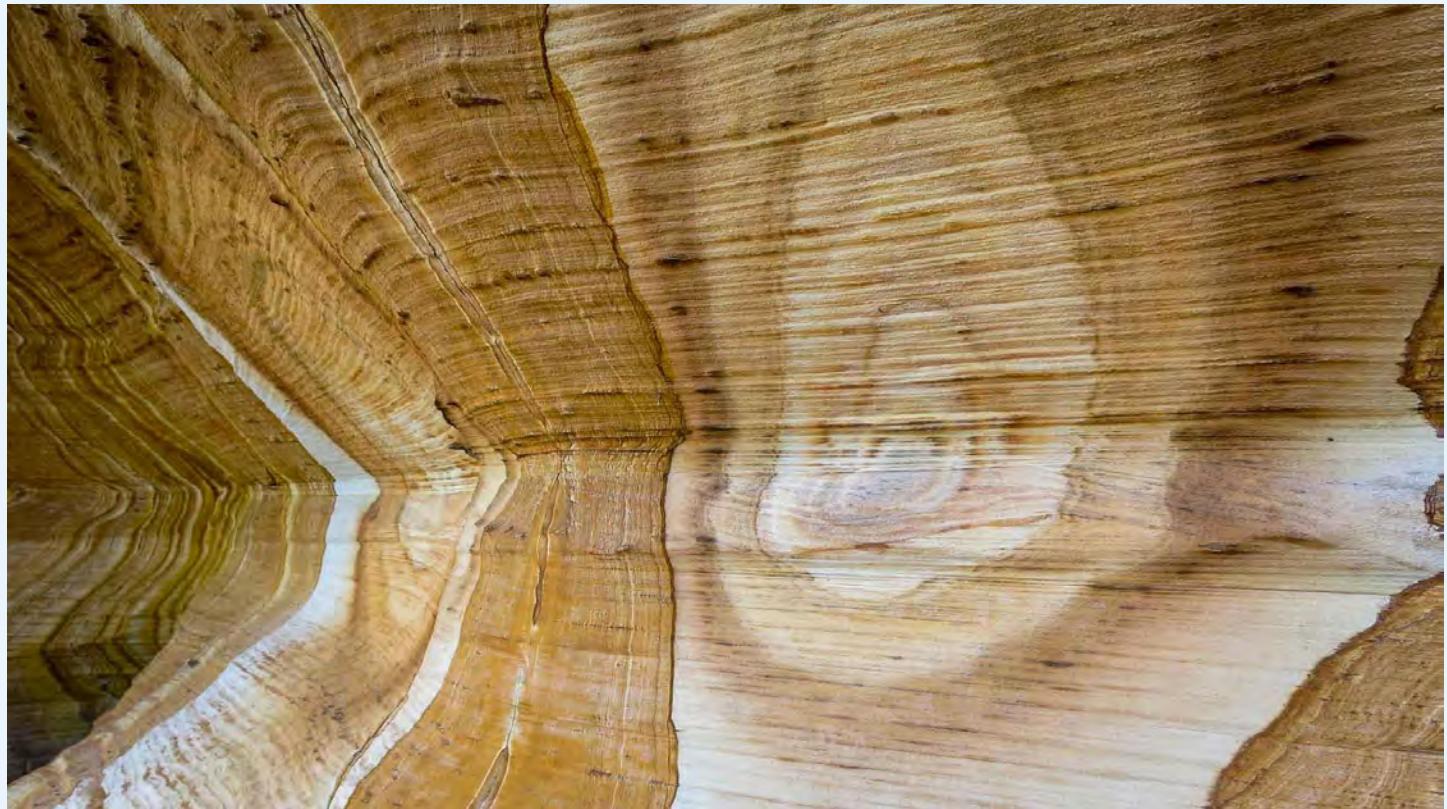
References

- Fetherston, J. M., 2010, *Dimension Stone in Western Australia, Volume 2*, WA Department of Mines and Petroleum, Mineral Resources Bulletin 42, Geological Survey of Western Australia.
Fetherston, J. M., 2013. *Boogardie Orbicular Granite, GSA Rock of the Month — March 2013*, The Australian Geologist Newsletter Number 166, March, 2013
Laurie, Dr J. (Editor), et al. 2013, *Geological TimeWalk*, Geoscience Australia, Canberra

Australian Landscapes

Stephanie Sykora

Maria Island is a small island located on the southeast coast of Tasmania. It contains some of the most visually stunning rocks around. The whole island is fascinating, but there are three geological wonders in particular to explore; the Painted Cliffs, the Fossil Cliffs, and the Great Unconformity.



Painted Cliffs Liesegang Bands, Maria Island, Tasmania, image Stephanie Sykora

Painted Cliffs

Vibrant orange and yellow cliffs of quartz sandstone of the Upper Permian Parmeener group comprise the famous Painted Cliffs of Maria Island. Within the sandstone rocks are *liesegang* bands and rings of brilliant reds, oranges and yellows. It is debated among geologists how exactly these symmetrical patterns are formed, but it essentially is a form of iron-oxide staining from flowing groundwater along structurally weak layers and fractures.



National Rock Garden – Newsletter No. 11



Fossil Cliffs

Fossil Cliffs are an extraordinary exposure of limestone, siltstone and mudstone with thousands of large

National Rock Garden – Newsletter No. 11

shelly fossils. These fossiliferous beds are up to 110 metres thick locally, and contain mostly bivalves, brachiopods and bryozoans. Within the fossil beds are large rounded glacial derived dropstones. Thus, what is so geologically unique about Fossil Cliffs is that this site is one of the rarest representations of a productive sub-polar cold-water shallow marine environment.



The Great Unconformity

The Great Unconformity has its prestigious name for a reason, and it is clear once you see the contact exposure. Underlying Maria Island are some of the oldest rocks in eastern Tasmania, the Mathina Supergroup of Silurian to Devonian age. These rocks are folded and metamorphosed sedimentary and igneous rock at oblique to sub-vertical angles to horizontal. Sharply truncating these rocks is a linear erosional surface, above which, reside the flat-lying Permian Parmeener Supergroup. The Great Unconformity is, therefore, a beautiful example of an angular unconformity, representing a ~100 million year gap in the geological record of Tasmania.



National Rock Garden – Newsletter No. 11



In summary, Tasmania's Maria Island is well worth a trip to explore its spectacular rocks. The whole island is a protected national park, so everything is within walking or biking distance. Both the Painted and Fossil Cliffs are easily walkable from the main boat dock and camp on Maria Island, however, if you want to see the Great Unconformity a hired boat is needed to drive around the northern tip of the island.

All images courtesy of Stephanie Sykora

Stephanie Sykora | Geologist | PhD Candidate | Blogger |
blog: www.exploringtheearth.com
email: sykorastephanie@gmail.com
twitter: @stephsykora

Online

View how Australian Opals are created

<http://www.nationalopal.com/opal-story/dvd.html>

National Rock Garden Masterplan

Please download the Masterplan from the NRG website (note this is a large file).

<http://www.nationalrockgarden.org.au/assets/News-letters/M1310140904Rock-Garden-MP-WEB-4-small.pdf>

Do you have a link to a YouTube clip or online resources you think the National Rock Garden community would like to see? If you do, please post it on our FaceBook page.

In the news: Canowindra's fish fossil declared NSW's newest emblem.

<http://www.canowindranews.com.au/story/3277055/canowindras-fish-fossil-declared-states-newest-emblem/>

Scientifically accurate Australian dinosaurs animated

<http://www.abc.net.au/news/2015-08-27/dinosaurs-live-in-worlds-most-scientifically-accurate-animations/6730862>

Working Bee and picnic afternoon tea at the National Rock Garden

Members of the NRG Steering Committee invite you to join them for a working bee and picnic afternoon tea on Sunday 27th September from 2-5 pm at the NRG site. It will be a very informal afternoon, during which we will do a bit of tidying up around the Federation Rocks display. Bring some gardening gloves, a bucket and a weeder if you want to help out with the maintenance, otherwise just bring some afternoon tea and come along for a chat. Contact: Brad Pillans (Ph. 0427-662112 or email brad.pillans@anu.edu.au)

Feedback and further information

We welcome feedback and suggestions on the development of the National Rock Garden. See the feedback boxes on the National Rock Garden website: www.nationalrockgarden.org.au

Tax deductible

The National Rock Garden is a registered Charity and all donations are tax deductible. Making a donation to the National Rock Garden is a great way to reduce your tax and feel good too! To make a donation, please visit the NRG website or phone (02) 9290 2194.

Providing a Bequest to the National Rock Garden

Introduction

The purpose of the National Rock Garden (NRG) is to celebrate Australia's rich geological heritage in a parkland setting within the National Capital, with a permanent display, showcasing the diversity of the rocks and minerals that contribute so significantly to the nation's landscape, heritage and prosperity. A detailed description of the NRG is available at www.nationalrockgarden.org.au

Individuals can make a significant contribution to future generations by providing assistance during the creation of the NRG or providing support for the ongoing evolution and maintenance of the NRG.

However, you don't need to be a geologist or a scientist or a business executive to make this kind of contribution. By making a bequest to the National Rock Garden, you too have the opportunity to make an enduring contribution to the accomplishment of the purpose to the NRG. The gift will also honour you, your family or someone close to you, for generations to come.

A bequest may include gifts of the residuary of an estate, a percentage of an estate, a specific sum of money or a particular asset such as real estate, a work of art or a parcel of shares. No matter what form it takes, a bequest advances the learning and discovery of Australian students, their family members and overseas visitors – those who are here today, and those who will be here 100 years from now.

Draft Bequest Wording

A will is a very personal statement. We strongly recommend that you consult with your legal adviser before drafting a new will or updating an existing one. We suggest that the wording below be used to indicate your intention to make a general or a targeted bequest to the National Rock Garden. Should you require specific assistance with endowment language, please call (02) 9290 2194.

General Purposes Bequest:

"I give [insert [insert dollar amount or % of my residuary estate] to **The National Rock Garden Trust**, ABN: 41 435 443 328, care of Suite 61, 104 Bathurst Street, Sydney NSW 2000, for the general purposes of the National Rock Garden and I direct that the receipt of the Secretary or Public Officer for the time being of the National Rock Garden Trust is an absolute discharge to my executors."

Specific Purposes Bequest – NRG Rock Specimen:

"I give [insert [insert dollar amount or % of my residuary estate] to **The National Rock Garden Trust**, ABN: 41 435 443 328, care of Suite 61, 104 Bathurst Street, Sydney NSW 2000, to locate transport and set in place one or more specific large rock specimens within the National Rock Garden ("Purpose") and I direct that the receipt of the Secretary or Public Officer for the time being of the National Rock Garden Trust is an absolute discharge to my executors."

Specific Purposes Bequest – NRG Education, Publicity and Promotion:

"I give [insert [insert dollar amount or % of my residuary estate] to **The National Rock Garden Trust**, ABN: 41 435 443 328, care of Suite 61, 104 Bathurst Street, Sydney NSW 2000, for the promotion of the educational goals of the NRG, the compilation of descriptions of the rock specimens and production of electronic listening devices for use by visitors to the NRG ("Purpose") and I direct that the receipt of



National Rock Garden – Newsletter No. 11

the Secretary or Public Officer for the time being of the National Rock Garden Trust is an absolute discharge to my executors."

Recognition of Bequest (TBC)

A bequest will be recognised appropriately by the directors of the National Rock Garden Trust.

Sponsoring the National Rock Garden

Building the National Rock Garden will take the participation of many volunteers, involve different tiers of government, provide work for contractors, designers and builders and ultimately involve many organisations and people. As highlighted above, we need major donors and sponsors to work with us as we build this national monument in the nation's capital. If you or your organisation would like to be financially involved, please contact Mike Smith mike_rpgeo@optusnet.com.au, Prof. Brad Pillans, brad.pillans@anu.edu.au or Sue Fletcher, sue@gsa.org.au

Newsletter

Compiled by Sue Fletcher. Edited by Brad Pillans

National Rock Garden

The newsletter is circulated twice a year, ordinarily December/January and June/July. New "friends" are welcome and can be added to the email circulation list by contacting the editor. You don't have to be an Earth scientist. Members of the public, students and educators with an interest in the evolution of the Australian continent are all welcome. Newsletters are also posted on the National Rock Garden website.

www.nationalrockgarden.org.au

Keep up with the latest NRG news, rock movements, rocks of the month and a whole lot more.

Like us on Facebook

<https://www.facebook.com/pages/National-Rock-Garden>