National Rock Garden

Celebrating the Geological Heritage of Australia

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

www.nationalrockgarden.org.au

A busy year for the NRG in 2023

Brad Pillans, Director, National Rock Garden

As you will read, in this newsletter, it has been a busy year for the NRG, with several new rock acquisitions (and more to come in 2024). We also made substantial progress towards moving to our new site within the National Arboretum Canberra, where a 'Coming Soon' sign has now been erected (Figure 1).

To assist our move to National Arboretum, I am delighted to announce that the Minerals Council of Australia (MCA) has recently donated $80,000 towards construction costs. This generous donation from the MCA, which is a Partner of the NRG, will enable us to establish the first rock displays at the new site early in 2024. High priorities include construction of an Indigenous welcome feature and transfer of our popular Federation Rocks from their current display site in Lindsay Pryor National Arboretum.

The indigenous welcome feature is being developed in consultation with Ngunnawal Elder, Dr Caroline Garuliiny Hughes AM. In September, Dr Hughes, selected a group of four beautiful, rounded boulders (tors) of local volcanic rock for inclusion in the welcome feature (Figure 2). As we admired the rocks, two wedge-tailed eagles were soaring nearby, almost as if they were giving their approval for the choice [the wedge-tailed eagle is a totem of the Ngunnawal people].

Figure 1. It's official! The NRG is coming soon to the National Arboretum Canberra. Brad Pillans standing with signage on the new NRG site. Image courtesy Kieran Wallace, National Arboretum, Canberra.

Figure 2. Dr Caroline Hughes (left) and Dr Marita Bradshaw (NRG Steering Committee, right) sitting with some of the boulders selected for the Indigenous welcome feature. Image courtesy Brad Pillans.

Three recent additions to the NRG collection are described later in this newsletter:

1. silcrete from Shannons Flat, just over the ACT border on the road to Adaminaby, NSW
2. red ribbon chert from Chaffey Dam, near Tamworth, NSW
3. witherite (barium carbonate) from the Rosebery mine in Tasmania.

Each of these three rocks have interesting stories to tell, but I'd like to elaborate on the first.

Silcrete is a near-surface equivalent of quartzite—both are rocks cemented by silica, but whereas quartzite is a metamorphic rock, formed at depth at high temperature and pressure, silcrete is formed near the surface at low temperature and pressure. Despite being a widespread rock type in Australia, its mode(s) of formation is (are) debated. It is very common in central Australia, where it often occurs forms high points in an otherwise flat landscape because of its resistance to erosion. Fossil leaves are sometimes preserved in silcrete, which provides a window into the types of plants that grew in the area when the silcrete formed (Figure 3). The hardness of silcrete also made it an attractive building stone – in northern South Australia, north of Goyder's Line, the landscape is dotted with the ruins of abandoned houses, often built of silcrete (Figure 4).

Figure 3. Plant fossils preserved in silcrete, Stuart Creek, South Australia. Image courtesy B. Pillans.

Figure 4. An abandoned stone cottage, built of silcrete, Stuart Creek, South Australia. Image courtesy B. Pillans.

Goyder's Line

In 1865, George Goyder, Surveyor General of South Australia, recommended against farming north of a line broadly corresponding to the 10" (~250mm) isohyet of modern annual rainfall. The line also marks a change in vegetation—from mallee scrub in the south to saltbush in the north. Areas north of the line were judged to be liable to drought and farmers were advised not to plant crops in this area. Coincidentally good rain fell in most years from 1867 to 1875, and Goyder's recommendation was ignored by farmers who pushed their crops ever further north. When rainfall patterns reverted to normal, many farms were abandoned. Decades later, well-known geographer Griffith Taylor, published a map (Figure 5) showing the suitability of Australia for agriculture, echoing the ideas of Goyder. I have always loved Taylor's bluntness in labelling large parts of Central Australia as 'almost useless'.

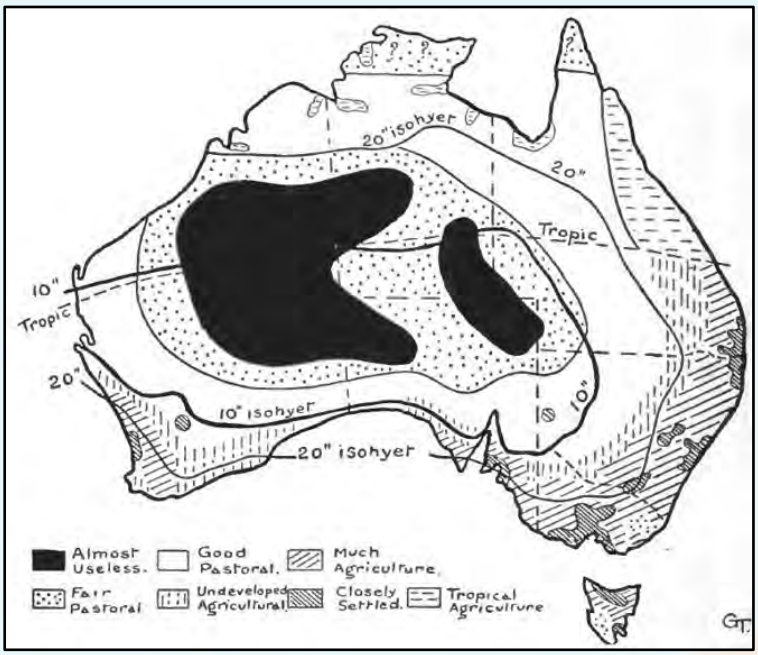


Figure 5. Griffith Taylor's view of the suitability of Australia for agriculture (from Taylor, 1911. Australia in its Physiographic and Economic Aspects. *Oxford University Press, London).*

Figure 6. Columnar basalt at Fingal Head, northern NSW. Cook Island, named after you know who, is in the background. Image courtesy B. Pillans.

For some years, I have known about a spectacular outcrop of columnar basalt at Fingal Head in northern NSW (Figure 6). In August, my wife, Sue, and I did a road trip to Brisbane, and I was able to tick Fingal Head off my bucket list. The basalt is thought to have erupted from Tweed Volcano, around 20 million years ago. The name Fingal is a nod to the Giant's Causeway in Ireland and Fingal's cave in Scotland, at either end of a basalt lava flow, with similarly spectacular columns, that extends across the Irish Sea—mostly underwater, of course. Although we don't have a specimen from Fingal Head in the NRG collection, we do have some nice basalt columns from the Gosford area of NSW.

Meanwhile, back in Canberra, we like to keep in touch with our local politicians. David Smith MP is the Federal member for the electorate of Bean, in Canberra, and is an enthusiastic supporter of the NRG (Figure 7). Last month, I attended a Volunteer Recognition event at Parliament House, hosted by David. NRG Steering Committee members, John Bain and Marita Bradshaw also attended, and we all had a chance to talk with David about the NRG, including our desire to source a rock from Norfolk Island, whose residents are David's constituents. Needless to say, David was very receptive to the idea!

I wish all Friends of the National Rock Garden a safe and happy Christmas and look forward to seeing many of you at the NRG in 2024.

Figure 7. David Smith MP, visiting the National Rock Garden with Brad Pillans in 2022. Image courtesy D. Smith.

Silcrete: latest arrival at the National Rock Garden

Ken McQueen, National Rock Garden Steering Committee

In an earlier edition of the NRG Newsletter (No. 23 May 2022), I described an interesting site in the Monaro region of southern NSW recently uncovered by widening of the Bobeyan Road south of Shannons Flat (https://www.nationalrockgarden.com.au/featured-article/road-cuttings-windows-to-ancient-landscapes/). The site was particularly interesting as it contained several silcrete bodies, exposed in three dimensions and in their original in situ position of formation. Thanks to the Snowy Monaro Regional Council, who provided permission and assistance, and the logistical planning facilitated by Peter Fogarty and Greg Bowman of NSW Soil Knowledge Network, the NRG has been able to obtain two large samples of the silcrete from the road cutting. This has also saved the blocks from the crushers or a fate as road-fill. A remaining section of the largest block is also still preserved in the road cutting for future scientific research and viewing by educational groups and the general public.

Left: Peter Fogarty (left) and Ken McQueen (right) examining some of the silcrete blocks removed from the Bobeyan Road cutting south of Shannons Flat, southern NSW. Image courtesy Brad Pillans. Right: Exposes surface of silcrete body overlying soft lake sediments. A good demonstration of the ability of silcrete to form indurated surfaces. Jones Plain 1 km from road cutting. Image courtesy K. McQueen.

Silcrete is an important rock across Australia. It was a key resource for aboriginal people for tool making and its formation has been important in landscape evolution, particularly for forming indurated (hard) and chemically resistant materials that commonly result in topographic inversion in our ancient landscapes. Examples of such inversion related to silcretes and ferricretes include the 'jump up' topography of north-central Queensland and the 'break away' country in Western Australia.

Silcrete showing preserved outlines of silicified and partly silicified gravel fragments. Image courtesy Ken McQueen.

Silcretes are of great scientific interest and their exact mode of origin is controversial and subject to ongoing research. Silcretes preserve remnants and ‘ghosts’ of the materials they have silicified including fossils from their main periods of formation during the Cenozoic era.

The National Rock Garden would like to acknowledge and thank all the people involved in procuring these important and iconic rocks, including Peter Fogarty and Greg Bowman of NSW Soil Knowledge Network, the Snowy Monaro Regional Council, Warwick Scarlett of Monaro Freight and Mat and Simon of RAR Cranes.

Men from the Snowy River – Monaro uploading two silcrete blocks at the Bobeyan Road cutting. Image courtesy Peter Fogarty.

Left: Unloading the main silcrete block at the National Arboretum. Image courtesy P. Fogarty. Right: Peter Fogarty (left) and Brad Pillans (right) with the silcrete blocks safely in place at the NRG storage site, National Arboretum Canberra. With help from your funding the NRG will be able to start work on moving these and other stored rocks to their display positions. Image courtesy P. Fogarty.

Specimens from the great ocean depths
Soon to travel to the National Rock Garden, Canberra

Dr Sarah Kachovich and Mike Smith, NRG Steering Committee

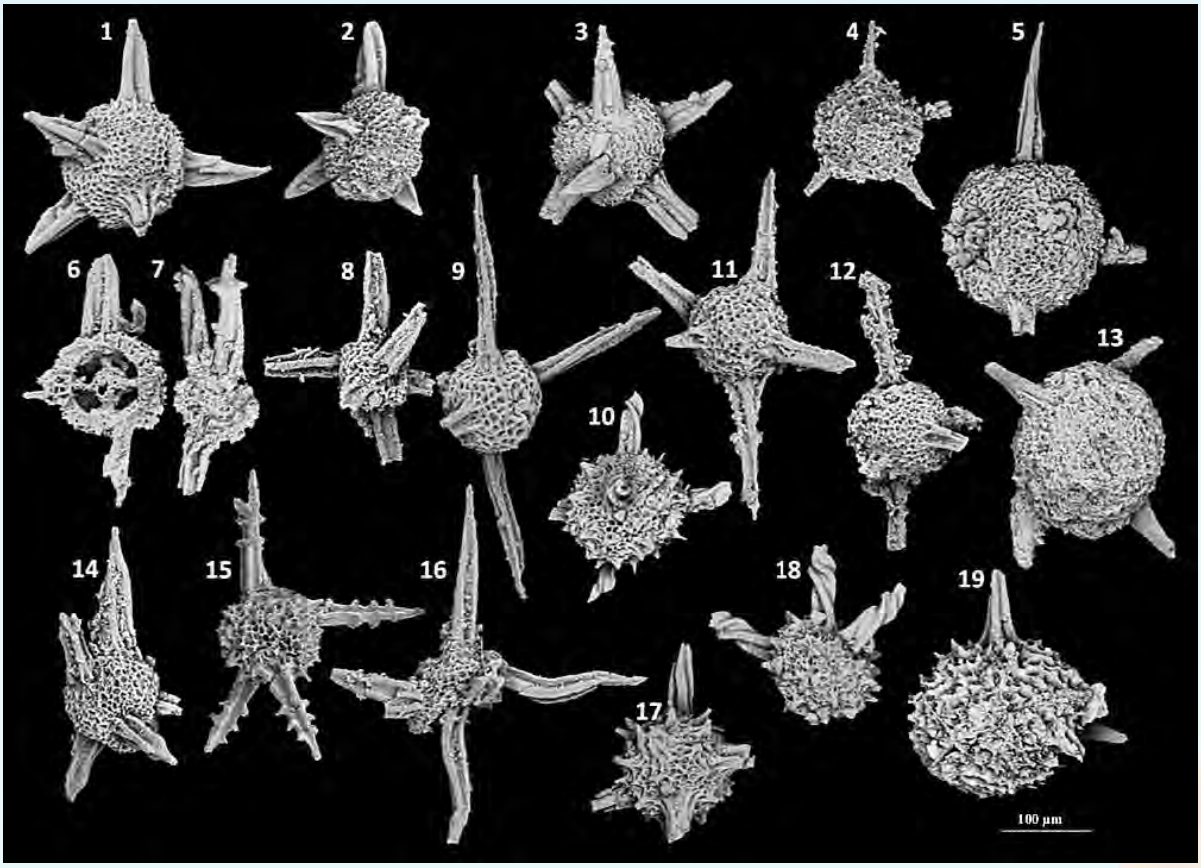
Chaffey Dam, in the Nundle area of central NSW, stands as a distinctive marvel in inland New South Wales, boasting a brick-red rock wall crafted from a semi-precious stone known as radiolarian chert. This geological masterpiece is accentuated by its unconventional flower-shaped spillway, creating a unique blend of engineering and natural beauty. With a capacity of 100 gigalitres, the dam was built during the years 1976 and 1979, then raised by 8 metres during 2014 to 2016. The main purpose of the dam is to supply irrigation and stock needs in the Peel River Valley of northern NSW, and to supply water to the city of Tamworth. Chaffey Dam Recreation Reserve is well known as a popular place for camping, bushwalking and wildlife spotting, as well as water sports such as swimming, sailing, boating and fishing.

Large chert boulder and plaque commemorating the completion of Chaffey Dam in 1979. Image courtesy M. Smith.

Red-ribbon chert, distinguished by its reddish-brown hue, intricate banding, and rich silica content, is a geological marvel with a fascinating origin. Silica and hematite, the primary minerals comprising this exceptional rock, were sourced from the skeletal remains of minute single-celled organisms that live in the ocean, known as radiolarians (see images on the next page). When plankton die, their organic walls decompose, and their skeletons sink. If they sink below the Calcium Compensation Depth (ranging from 3 to 5 kilometres), all calcium carbonate dissolves and biosilica begins to accumulate on the seafloor, far removed from any mainland river source of sediment. The rock's composition tells a tale of the rhythmic alternation between quartz-rich chert beds and clay-rich interbeds, showcasing a unique geological history.

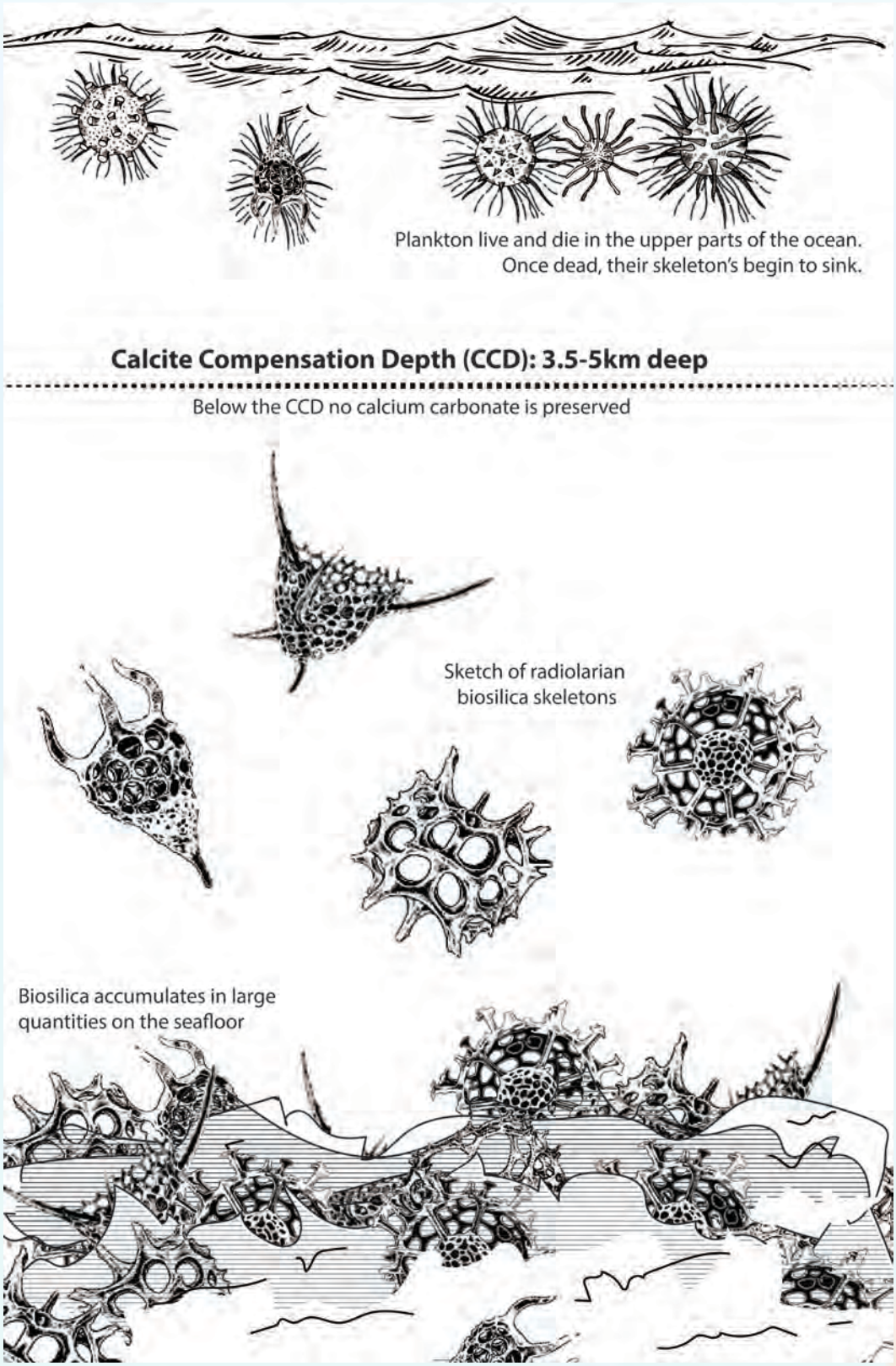
Within the radiolarian red-ribbon chert of the Nundle area, unfathomable numbers of radiolarian 'ghosts' can be discerned in every sample, alongside the occasional presence of a rare conodont tooth. The term ‘jasper’ is often interchangeably used with chert due to the prevalence of disseminated fine-grained iron oxide. The iron minerals, a result of precipitation from seawater, sink to the ocean floor, seamlessly merging with the silica skeletons of radiolarians.

Sample images of individual radiolaria species, Plate 1. Note scale bar at lower right. Image from Kachovich, 2013.



Sample images of individual radiolaria species, Plate 2. Note scale bar at lower right. Image from Kachovich, 2013.

The most impressive part of radiolarian chert from Chaffey Dam is a manifestation of allochthonous processes, which was far away from any sedimentary input derived from rivers on the original Australian continent. It highlights the diversity of rocks that make up the Australian continent. The chert is also often referred to as jasper due to the abundance of disseminated fine-grained hematite which precipitated out of the sea water and sank to the base of the ocean to blend with the silica skeletons.



Cartoon showing how the rock was formed. Image courtesy S. Kachovich.

This rock belongs to the Woolomin Group of rocks, which is an elongate belt approximately 10 km wide and 300 km long immediately east of the Peel Fault System. Originally, the material was deposited as soft, flat-lying sediment. Over millions of years (since the Ordovician) these formations were compacted and contorted, and now form an elevated outcrop of highly durable rock.

While this specimen is very important from a strictly scientific perspective, it is also very important for engineering works. The hardness of the chert has made it suitable for the construction of Chaffey Dam, a major geotechnical project completed in 1979. In order to provide sufficient water for the city of Tamworth and surrounds, and to meet modern safety requirements, the dam was raised in 2016 by 8 m to its current height of 62 m. The length of the dam is 500 m, and it has a catchment area of 420 km^2.

Group of people in the Chaffey Dam Spillway, in front of the 200 m wall of radiolarian red-ribbon chert. Image courtesy S. Kachovich.

The chert's physical properties also play a crucial role in the material culture of Australian Aboriginals, especially for the Gamilaroi Group and Anaiwan history in the region. Renowned for its hardness and conchoidal fracturing properties, Aboriginal communities utilised chert extensively for crafting tools and weapons. The exceptional flaking qualities of chert made it ideal for producing sharp-edged blades, spearheads, and cutting implements essential for daily activities such as hunting, woodworking, and food processing. Read more in the Chaffey Dam Aboriginal Cultural Heritage Assessment https://www.waternsw.com.au/__data/assets/pdf_file/0003/118074/Chaffey-EIS-Appendix-9.pdf.

Location of various boulders of chert in relation to Chaffey Dam. Imagery from Google Earth.

During August, Mike Smith and Dr Paul Ashley visited the site in the company of the site manager from SydneyWater. There are around 15 boulders estimated at 1–5 t in the western cluster of large rocks, all of which are accessible to a crane truck, such as used for other NRG rock movements. Many of these boulders would be suitable for the NRG. There are eight good-size boulders located in the centre of the broad dump of much smaller fragments, most of which would also be very suitable for the Garden (see an example in photo below). The Sydney Minerals Exploration Discussion Group (SMEDG) has agreed to fund the transportation of three specimens and their preparation for display.

Dr Paul Ashley and a chert boulder that displays very good bedding and veining. Image courtesy Mike Smith.

The attributes of the Chaffey Dam specimens which favour acquisition for geoscience education at the National Rock Garden include:

- these are physically resistive, highly siliceous chemical and biogenic sediments, within which the pervasive presence of up to 10 to 20% iron give the rocks a rich red colour.
- original bedding is locally preserved in many blocks of rock which is a critical attribute to display.
- deformation of the sedimentary layers is often observed as local mesoscopic folding, as well as fracturing and veining.
- wide veins of remobilised quartz (up to 5cm thick) provide a white contrast to the general red appearance of the rocks.
- at a much finer scale, many blocks contain intense micro veining of black minerals (oxides of Fe plus Mn), which adds interesting character.

These rocks are a mixture of chemical sedimentary and biogenic sedimentary material and may contain a very diverse range of radiolaria species (Kachovich, 2013). Radiolaria can be observed with a 20x hand lens.

An example of magnified piece of chert shows radiolaria as small dark spheres about the size of a pencil point, termed ghosts. Image courtesy S Kachovich.

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Olympic Dam—but on the beach!

Steve Hill, Chief Scientist, Geoscience Australia

If you want to spend a day at the beach but also amongst part of the Earth's most metal endowed geology, then a trip to Pine Point on the Yorke Peninsula is a day well spent. Nowhere else is such a complete section of mineralised geology of the iconic Olympic Copper-Gold Province (which hosts the Olympic Dam, Prominent Hill, Carrapateena and Moonta-Wallaroo deposits) of the eastern Gawler Craton so well exposed in the landscape—in this case, along a quiet stretch of coastline within a two-hour drive from Adelaide. The coastal section, extending several kilometres northwards from Pine Point, includes uplifted and eroded sections within the Pine Point Fault Zone featuring Iron-Oxide-Copper-Gold (IOCG) mineralised Olympic Province geology, as well as some of the diversity of the Cambrian to present day basin cover that otherwise conceals this incredibly metal-endowed part of the Earth's crust.

A good starting point for exploring this area's geology is from the northern extent of the mostly beach shack village of Pine Point where Main St / Esplanade ends… that's assuming that you don't include stop-overs at the bakeries of Port Wakefield and Ardrossan as invariably the real 'starting point' for exploring the geology of this part of the world! (Maybe not a Kitchener bun, but you will soon be able to walk off baked goods consumption by looking at geology!) From there it is up to you how far northwards you walk. You can either turn back and retrace your steps or else continue onwards if you have organised a car-shuffle for one of the coastal access points either near Muloowurtie Point / Harts Mine or further north at Rogues Point. The best time to do this walk is at low-tide, and please be careful at the base of some of the unstable cliff sections.

The first part of the walk northwards includes interesting exposures of sedimentary rocks of the Stansbury Basin (Cambrian, Yurunga Formation) where there are some folds in red-beds and quartzites as well as some fanglomerates that are likely to have been deposited along the paleo-scarp of the Pine Point Fault. The early part of the walk provides interesting juxtaposition of the younger Cambrian sequence mostly along the shore-platform and through the beach, with the older more weathered Proterozoic Gawler Craton rocks exposed in the faulted coastal bluffs. A good guide for finding exposures of the mineralised Proterozoic sequence is to look for higher concentrations of magnetite in the beach sands (a magnet can be helpful here) and trace these back to the source at the coastal bluff or gully.

Folded Cambrian sedimentary rocks north of Pine Point. Note the fanglomerate beds as well as the Pine Point Fault escarpment forming the coastal bluff in the background.
Image courtesy S. Hill.

'Box-works' formed from the weathering of the skarn-type IOCG mineralisation at the headland on the southern edge of White Clay Bay. Image courtesy S. Hill.

After about a kilometre, the coast enters a small headland that shelters on its northern side, a small cove with spectacular cliffs composed of bright, white kaolinized granite overlain with mostly red-brown and yellow-brown sediments of the Cenozoic St Vincent Basin. This place is known as White Clay Bay, and you can easily spend quite a bit of time examining the geology here. Near the headland at the southern end of the bay are jagged, dark exposures of weathered skarn-type IOCG mineralisation, associated with amphibole-rich, calcsilicate alteration along steeply dipping structures. The exposures have prominent 'box-work' textures formed by iron oxides replacing the outlines of amphiboles, sulphides and the intense fracturing in the rock. This mineralisation is closely associated with the Dead Horse Bay uranium prospect (Hiern, 1957) and the Hillside IOCG deposit (which occurs beneath the farm paddocks immediately inland of these coastal exposures). Within the bay itself, the prominent, white kaolinized granite is part of the Mesoproterozoic, Arthurton Granite that has been both hydrothermally altered and weathered. These clays once supported a small mining operation, where loading barges could access the coastal exposures (Crawford, 1957; Keeling et al., 2000).

The overlying Cenozoic St Vincent Basin sediments are mostly part of the Eocene shallow marine, estuarine and beach deposits (Stuart, 1970). Towards the upper parts of the sequence there are remnants of Oligocene-Miocene Port Vincent Limestone and sections through Quaternary sediments, mostly including aeolian dunes with paleosols and calcretes. Interestingly there are two types of calcrete in these sections: 1. friable, pedogenic types that have formed in the soils of the dune sequence; and, 2. typically deeper and harder pedogenic calcretes that have formed from the weathering of the Port Vincent Limestone. Each of these two calcrete types have very different geochemical properties associated with their different evolution.

From here it is spectacular to continue northwards where the coastal section also includes further exposures of faulting along the Pine Point Fault Zone, Paleoproterozoic mafic rocks, intense alteration zones, as well as green, malachite-rich exposures of copper mineralisation, such as at Harts Mine (Drexel, 1979). How much further north you proceed is really a question of your willingness, the tides and how you are managing either a walk back to Pine Point or a car drop-off / pick-up further north (and perhaps whether you did have a Kitchener bun at the bakery!).

Looking north to White Clay Bay, with weathered skarn-type IOCG mineralisation in foreground. Prominent white cliffs in background are the kaolinized Arthurton Granite, overlain by the red-brown sediments of the St Vincent Basin. Image courtesy S. Hill.

There are plenty of other great nearby sites to view geology on the northeastern Yorke Peninsula That could add to your day. A few other sites include the cliffs at Ardrossan Jetty (ferruginised Cainozoic sediments), Ardrossan Lookout (just off Yorke Highway on southern margins of Ardrossan township), Rocky (Quartoo) Point (St Vincent Basin section with silcretes), Port Vincent (Permian erratics and sediments).

Acknowledgements

Thanks to Geoff Lowe and Steve Olsen from when they worked at Rex Minerals and sparked interest in the potential for regolith geology study in this area, as well as Rex Minerals geologists including Marc Twining, Rohan Worland, and Lachlan Cole. The author has run numerous group field trips to this site for Deep Exploration Technologies Cooperative Research Centre (DET CRC), University of Adelaide, Geological Survey of South Australia, Australian Regolith Geoscientists Alliance of the Geological Society of Australia, and the National Exploration School (NExUS) and benefitted enormously from discussions on all of these trips. For generations the Narrunga people have had a close connection to this amazing landscape, please be mindful and respectful of this when visiting the area.

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A generous gift to the NRG

Michelle Cooper, Director, National Rock Garden

A few months ago, Bill Bale reached out to the National Rock Garden, to offer us a small piece of zebra rock, which you might know is the NRG's rock emblem and inspires the colour and features of our logo.

Bill's family was living in Canberra when the Second World War broke out and his father, Dick Bale, was with the Department of Civil Aviation. However, in 1943 the Department moved him to be in charge of an RAAF Advanced Operational Base at Wyndham until the end of the war. When he returned to Canberra, he brought back a number of items, including the zebra rock, which Bill believes would have been gifted to his father by local people as souvenirs.

Bill was happy to return the rock to its 'second home', as a gift from Dick Bale (deceased) via his sons George, Rick (deceased), David and Bill. Thank you, Dick and family, we will be sure to look after it!

The piece of zebra rock donated to the National Rock Garden by Dick Bale's family. Image courtesy M. Cooper.

A different view of the piece of zebra rock donated to the National Rock Garden by Dick Bale's family. Image courtesy M. Cooper

Witherite—coming soon to the National Rock Garden

Ralph Bottrill, Senior Geologist, Mineral Resources Tasmania

Mineral Resources Tasmania is coordinating the acquisition of a large block of witherite from the Rosebery base metal mine for the National Rock Garden in Canberra (Figures 1 and 2).

Figures 1 and 2: Large blocks of pure witherite being extracted from the Rosebery mine. Images courtesy Rosebery mine.

Witherite was named after William Withering (1741–1799), an English physician and naturalist, who first described the mineral in 1784, from England. A barium carbonate ($BaCO_3$) mineral, witherite is the barium analogue of aragonite (a common, naturally occurring crystal form of calcium carbonate, $CaCO_3$), but witherite is far less common. It has been found to be very widespread in many ore deposits worldwide, but is rarely present in large and rich quantities, as is seen in the Rosebery mine.

Witherite can be colourless, white, or pale shades of grey, yellow, orange and pink, and is colourless in transmitted light. It has a vitreous to resinous lustre, with a high specific gravity of 4.3, meaning that the weight of witherite is 4.3 times the weight of an equivalent volume of water. Its low Mohs Hardness of 3–3.5 indicates that witherite is quite soft and can be quite easily scratched by piece of copper or iron. While it is orthorhombic in crystal structure, witherite specimens are usually massive (have no distinct crystal shape) or occur in pseudo-hexagonal, cyclically twinned crystals rather like aragonite (Figures 3 and 4).

Figures 3 and 4. Witherite crystals from Rosebery mine. Both specimens are approx. 50mm across. Images courtesy R Bottrill.

Witherite is fairly insoluble but toxic if ingested, and it has been used as a rat poison. However, handling of witherite is not a major cause of concern as long as you avoid breathing in dust (such as may be generated by grinding, sawing or trimming specimens) and you wash your hands after handling.

Witherite occurs with some rarer barium minerals in the Rosebery mine, including barytocalcite, alstonite and harmotome. Sphalerite, pyrite and galena are also commonly associated with it there. It occurs in large fracture zones (probable faults), mostly in the Y lens (a part of the orebody), commonly with large, cavernous open spaces lined with sparkling crystals. The occurrence of these minerals is of world significance, and the specimens recovered are amongst the best in the world.

Figure 5 (left): Pink / yellow barytocalcite on grey witherite and pyrite, Rosebery mine. 70 mm across. Figure 6 (right): White harmotome on grey witherite, galena and sphalerite, Rosebery mine. 80 mm across. Images by R Bottrill.

The origin of this Ba-rich material is uncertain. The Rosebery orebody is generally considered to be a VHMS deposit, with numerous lenses of stratabound Pb-Zn-Fe sulphides with significant Cu, Ag, Au, Mn carbonates and baryte, hosted in Cambrian volcaniclastics of the Mt Read Volcanics. The ores were remobilised slightly during Late Devonian by a granite intrusion, forming zones variably rich in Mn-rich garnet, rhodonite, danalite and tourmaline. It seems likely that this Devonian alteration also remobilised some of the syngenetic baryte into open fracture zones, crystallising as various barium carbonates and silicates.

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If you have an idea for a newsletter story, or there is a rock that you would like to see featured in a future NRG newsletter, please let us know via email or Facebook.

Expat Australian rocks

Dr Marita Bradshaw, National Rock Garden Steering Committee

More than half a million Australian expatriates live overseas (UN DESA, 2020) but did you know that there are also some notable ‘expat rocks’ to be found scattered across the globe?

In the Tiergarten, Berlin, you can find spectacular polished slabs of orbicular granite from Boogardie Station, near Mount Magnet, Western Australia. These beautiful Australian rocks and other outstanding geological specimens from other continents make up the Global Stones, Wolfgang Kraker von Schwarzenfeld’s project ‘for global awareness and peace, and as a monument for the future’ (http://globalstone.de/). Five pieces of the Archean orbicular granite are arranged around a large boulder of Proterozoic banded iron formation from Mount Tom Price, in the Pilbara, Western Australia to form the Peace Rocks. The arrangement is reminiscent of the petals of a flower and so mirrors the ‘crystal flowers’ that have grown within the orbicular granite.

Aussie expats amongst rocks from home on a wintry Berlin day (Boogardie granite at left and banded iron to the right).
Image courtesy M. Bradshaw.

The last time these rocks from the Yilgarn and Pilbara in outback Western Australia were out in such a cold, high latitude climate was probably in the Permian Ice Age (see https://www.nationalrockgarden.com.au/featured-article/australia-under-ice/).

The Global Stones in the Tiergarten, Berlin, Germany. The Australian Peace Rocks are the group to the right. Image courtesy M. Bradshaw.

Wolfgang Kraker von Schwarzenfeld at the Federation Rocks display, Canberra. Image courtesy B. Pillans.

The National Rock Garden also has five large pieces of Boogardie orbicular granite that were gifted to us by Wolfgang Kraker von Schwarzenfeld. The rocks are on temporary display at Geoscience Australia, in Canberra, until such time as we are ready to place them on permanent display at the new NRG site.

The Boogardie granite specimens display large (5 to 15 cm across) orbicules made up of concentric zones of different minerals (hornblende, biotite, plagioclase) to produce black, grey to white bands. The orbicular zones are hosted in a pink, medium-grained, late Archean granitic rock. For more information, take a look at the orbicular granite page on our website (https://www.nationalrockgarden.com.au/rock-collection/orbicular-granite/) and our article on the Mount Magnet Astro Rocks Festival (https://www.nationalrockgarden.com.au/featured-article/mount-magnet-astro-rocks-fest/).

Left: Orbicular granite with pink tonalite vein, Tiergarten, Berlin. Image courtesy M. Bradshaw. Right: Close-up of orbicules in the National Rock Garden's orbicular granite specimen. Image courtesy M. Cooper.

The Seepark at St Gilgen, Austria. Image courtesy Jane Riddell (© Jane Riddell – stock.adobe.com).

By a picturesque lake in Austria are rocks from the south-west slopes of NSW transformed into beautiful sculptures by Andreas Buisman, a great friend to the NRG. The Adelong Norite artworks are in the Seepark at St Gilgen, Austria (https://andreas-buisman.com/ https://andreas-buisman.com/seepark-st-gilgen/). The Adelong Norite has long been favoured as a decorative stone with its rich dark polished surfaces. Andreas's sculptures often contrast the highly polished areas with the natural weathered surface and other interestingly crafted textures. The specimen of Adelong Norite at the current NRG site in Canberra has also been sculptured by Andreas (https://www.nationalrockgarden.com.au/rock-collection/adelong-norite/).

Andreas Buisman sculptures in the Seepark, St Gilgen, Austria. Image courtesy M. Bradshaw.

Close up of two of Andreas Buisman's sculptures in the Seepark, St Gilgen, Austria. Image courtesy M. Bradshaw.

References

United Nations Department of Economic and Social Affairs, Population Division, 2020. International Migration 2020 Highlights (ST/ESA/SER.A/452). https://www.un.org/development/desa/pd/sites/www.un.org.development.desa.pd/files/undesa_pd_2020_international_migration_highlights.pdf. Last accessed 20 December 2023.

The Federation Rocks display at the National Rock Garden

WE NEED YOUR FINANCIAL SUPPORT

Although work by committee members and friends of the National Rock Garden is voluntary, we nevertheless incur the regular costs of an incorporated entity. We therefore seek donations from individuals who recognise the importance of geoscience and geoscience education to the future of Australia.

The signing of the contract with the ACT Government for the re-location of the National Rock Garden into the very prominent Forest 13 block at the National Arboretum Canberra provides security of tenure for the Rock Garden and enables us to move more rocks into the ACT. We will incur substantial costs, including for transport and delivery of rock specimens, preparation of specimens for display, creation of descriptive plaques for the rocks, and maintenance of the NRG site. We will be encouraging corporate contributions for the transportation of larger rocks from interstate. Our immediate task, following the works approval granted by the National Capital Authority earlier this year, is to appoint, via tender, a construction company to undertake the site landscaping.

Please make a tax deductible donation:

BANK TRANSFER:

Account Name: National Rock Garden
BSB: 082-057
Account Number: 11-836-1338

CREDIT CARD:

Name: ……

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Credit card: Visa: ……. MasterCard: ……. (Please tick one)

Credit card number: ……

Name on card: …… Expiry date: …… CVV: ……

Email address: ……

Phone number: …… Donation amount: $……

Signature: ……

Please send this information to:

Mail: National Rock Garden Trust Inc. PO Box 576, Crows Nest, NSW 1585

Email: brad.pillans@anu.edu.au

Cheques can also be made out to the National Rock Garden Trust and sent to the address above.

Feedback and further information

We welcome feedback and suggestions on the development of the National Rock Garden and would love to hear from you! Email us at: brad.pillans@anu.edu.au or michelle.cooper@ga.gov.au.

Tax deductible

The National Rock Garden is a registered charity and all donations over $2 are tax deductible. Making a donation to the National Rock Garden is a great way to reduce your tax and feel good too! To donate, please complete the form on the previous page or visit https://www.nationalrockgarden.com.au/support/.

Join our mailing list

The newsletter is circulated twice a year. New 'friends' are welcome and can be added to the email circulation list by contacting Brad or Michelle (details above), or by clicking the 'subscribe' button on the NRG homepage.

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Newsletter edited by Michelle Cooper.