National Rock Garden

Celebrating the Geological Heritage of Australia

Newsletter No. 22

December 2021

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

Update from the NRG Chair

Brad Pillans, Director, National Rock Garden

Since the announcement of our move to a new site within the National Arboretum Canberra, earlier this year, the NRG is moving forward with renewed momentum – despite COVID lockdown restrictions in Canberra and elsewhere.

Glacial erratics, eroded from nearby outcrops of Permian tillite, Hallett Cove, SA. Image courtesy Brad Pillans.

Assisted by a generous donation from long-time GSA member, Doug Finlayson, and his wife Caryl, we have commissioned Canberra-based landscape architects, Harris Hobbs Landscapes, to produce a landscape design of the new site. That landscape design, which is nearing completion, features meandering paths and themed rock clusters across the one hectare site that we have been allocated within the arboretum. Reflecting on his and Caryl's donation, Doug says "I hope it might be a catalyst for others to dig into their pockets." I couldn't agree more! We will have many expenses to cover in 2022 and now is the perfect time to make a donation, big or small, to the NRG – see page 24.

Doug and Caryl came up with the idea of a national rock garden during a visit to Finland in 2008, as Doug describes later in this newsletter. On returning to Canberra, Doug gave a talk to the ACT Division of GSA to promote the idea – it took off, and the NRG was officially launched in 2010.

Once our landscape design has been approved by ACT Government, we are hoping to begin site works in the first half of 2022, including installation of the first tranche of display rocks (20–30 specimens in the range of 5–20 tonnes each). Needless to say, our NRG state and territory rock selection subcommittees have been busy identifying and securing suitable rocks for display.

In November I met with Ngunnawal elders, Aunty Caroline Hughes and Aunty Mary Mudford, who have agreed to collaborate on developing a Ngunnawal welcome feature at the NRG. I also met with representatives from the Southern Tablelands Ecosystem Park (STEP), which is located adjacent to the NRG site within the National Arboretum, to discuss synergies between the NRG and STEP.

Design of our new website is well underway, funded by NRG partner, the Minerals Council of Australia, and we hope that it might be 'live' early in the New Year. The NRG also has a new logo, with the red and white stripes being inspired by the colour pattern of zebra rock, which has a pretty strong claim to be Australia's national rock, as described in the following article.

Climate change, specifically, global warming as a consequence of anthropogenic greenhouse gas emissions, is in the news almost constantly these days. However, it wasn't always so, as earth history reveals periods of major glaciation, when continental land masses, including Australia, were covered by Antarctic-size ice sheets. One such extended glacial period occurred during the Late Carboniferous and Early Permian periods (320–280 million years ago), when Australia was part of the great southern continent of Gondwana and southern Australia straddled the Antarctic Circle. We plan to display several rocks in the NRG from this interesting time period. Read more in the article by Marita Bradshaw and Mike Smith (p.7).

The NRG would not be a national rock garden without rocks from iconic mines such as Mt Isa and Broken Hill. In his article, Russ Lord highlights some beautiful rocks from both these mines.

Finally, in this issue, Ken McQueen investigates an impressive stone memorial column in Ballina, NSW and makes an interesting discovery. Enjoy!

Zebra rock: Australia's national rock?

Brad Pillans, Director, National Rock Garden

The NRG has a new logo, with the red and white stripes being inspired by the colour pattern of zebra rock, a rock which is only found in the Kununurra area of northern WA and nowhere else in the world. Zebra rock has strong claim to being Australia's national rock and being represented in the National Rock Garden. Whether we will be able to acquire a suitable large specimen is rather uncertain because large blocks are rare. Needless to say, we remain hopeful…

National Rock Garden
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The new National Rock Garden logo.

Just how zebra rock forms remains something of a mystery, but regardless of how it forms, the precise combination of processes must be very rare. Otherwise it would be found in other places. The most similar rock, called print stone, is found near Mt Tom Price, in the Pilbara region of WA, but the colour banding is thinner and less regular than zebra rock.

An outcrop of zebra rock near Kununurra. Image courtesy Andrew Coward.

At first sight, the red and white stripes of zebra rock look a lot like alternating sedimentary layers, and, indeed, this was the initial suggestion when it was first described in the 1920's. However, closer inspection shows that some of the stripes cut across the sedimentary layers of the host rock, a claystone of Ediacaran age, called the Johnny Cake Shale. This means that the stripes formed after the sediment was deposited. A key question is whether the white stripes formed in a uniformly red rock or whether the red stripes formed in a uniformly white rock – a bit like asking whether zebras have black stripes on a white coat or white stripes on a black coat.

A number of other theories about the origin of zebra rock have been proposed, including:
1. hydrothermal alteration by hot, percolating fluids
2. Liesegang banding resulting from groundwater flow
3. acid sulphate soil weathering
4. precipitation from a colloidal suspension
5. microbial activity.

Mineralogical investigations by Loughnan & Roberts (1990) showed that the claystone contains kaolinite, quartz, dickite (a polymorph of kaolinite), sericite (a type of mica), feldspar and alunite and that the red stripes are coloured by the iron oxide, hematite. The presence of dickite lends some support to a hydrothermal origin because dickite commonly, but not exclusively, forms by hydrothermal alteration. On the other hand, in a recent detailed study of zebra rock, published in the Australian Journal of Earth Sciences, Greg Retallack makes the case for an acid sulphate soil weathering origin (Retallack 2020).

Cut pieces of zebra rock reveal the stripy pattern. Image courtesy Brad Pillans.

There are some famous names along the road to discovering how zebra rock forms. For a start, there is the German chemist, Raphael Edward Liesegang (1869-1947), who was the first to systematically study the phenomenon of periodic (rhythmic) precipitation in gels, and after whom Liesegang rings or bands are named. Then there is the English mathematician and computer scientist, Alan Turing (1912-1954), who, among many great achievements (e.g. breaking the German Enigma Code during World War II), proposed a model of diffusion processes that results in patterns very similar to those seen in zebra rock (e.g. Kondo & Miura 2010).

Alan Turing. Image courtesy National Portrait Gallery London, image NPG x27078.

My own contribution towards understanding the origin of zebra rock involves studying the paleomagnetism of the red stripes – when fine-grained hematite precipitates a magnetic signal is locked into the hematite in the direction of the Earth's magnetic field. We can then use that signal to estimate when the hematite formed and place constraints on how long after deposition of the claystone the red stripes were formed. Also from laboratory measurements, we have been able to show that the rock has not been subject to heating above 300°C, which means that if hydrothermal fluids were involved, they must have been less than this – still pretty hot, though.

In June, this year, I visited Kununurra, with my ANU colleague, Professor Andrew Roberts, and PhD student, Andrew Coward, from Monash University, to collect more samples of zebra rock. The trip involved transiting through 5 states and territories (ACT, NSW, QLD, VIC, NT and WA) in the midst of variable COVID-19 restrictions. Remarkably, we managed to avoid any lockdowns and quarantining. I also had a swim in Lake Argyle (it was hot in Kununurra, even in June), which is inhabited by fresh-water crocodiles, and lived to tell the tale! There are reports that salt-water crocs occasionally make their way into Lake Argyle, but locals informed me that they don't breed there – hmm…

By the time Andrew Coward completes his PhD thesis on zebra rock, perhaps we will finally know how it formed. No pressure, Andrew!

Prof. Andrew Roberts (ANU) and Andrew Coward (Monash University) in the field at Kununurra. Image courtesy Brad Pillans.

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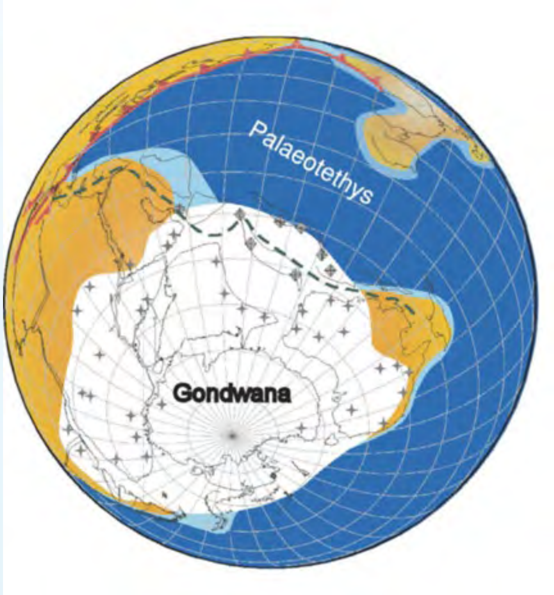
Brad Pillans, swimming with crocodiles in Lake Argyle, June 2021. Image courtesy Andrew Roberts.

Australia under ice

Marita Bradshaw and Mike Smith, National Rock Garden Steering Committee

In the festive season thoughts tend towards warm summer days and iced beverages but cast your mind back around 300 million years to when there was a lot more ice around and nothing bottled to pour it over. Australia and much of Gondwana was in the grip of a major ice age, that took hold in the Late Carboniferous and extended well into the Permian as ice sheets advanced and retreated several times across the great southern landmass. This was the last major glaciation on the Australian continent, in contrast to Northern Europe and America where the ice began to retreat only around 15,000 years ago. There are several locations where you can see the record of Australia's last major ice age "in situ" in national parks and reserves; and plans are underway to gather some exhibits for the National Rock Garden that represent this dramatic time in Australia's geological history.



Maximum ice coverage (white area) on Gondwana in the early Permian (from Figure 1, Yeh & Shellnutt, 2016).

Permian glacially influenced sediments, sometimes kilometres thick, are found in all Australian states. There were large ice sheets, smaller valley glaciers, glacial lakes and outwash plains, and where the ice meet the sea, floating ice shelves. Sediments were delivered to many different basins where they were deposited under a variety of terrestrial and marine conditions. Examples of rocks that record some of these icy environments are described below.

Tallong Conglomerate, Sydney Basin, NSW

The earliest rocks deposited in the Sydney Basin are coarse conglomerates and sandstones of Early Permian age (around 295 to 280 million years ago) that fill valleys cut into older bedrock along the western basin margin. Some of these channels extend eastward for 50 km or more and are thought to be the product of ice and meltwater from alpine glaciers (Herbert & Helby,1980; Bembrick, 2015). The Talllong Conglomerate is one of these units that has been mapped as a palaeovalley deposit, 3-4 km wide, some 100 km long and over 200m thick. In outcrop the Tallong forms cliffs of well lithified, poorly to moderately sorted conglomerate and sandstone interbeds. It is made up of rounded to angular cobbles and pebbles and both clast-supported and matrix-supported fabrics are seen. The cobbles are a mixture of rock types including quartzite, sandstone, vein quartz, chert and volcanics (Trigg & Campbell, 2016).

Tallong Conglomerate outcrop near Marulan. Image courtesy Mike Smith.

Wandrawandian Siltstone, Sydney Basin, NSW

Further out into the basin finer sediments were deposited where glacial outwash rivers met the sea. Boulders sitting isolated in mudstone show that the ice did reach the sea at some times and in some places. Such ice-rafted “dropstones” fell to the muddy seabed as floating ice melted that still entrained some larger rocks from onshore. The Wandrawandian Siltstone that outcrops on the coast near Ulladulla is an example of a glacially influenced Permian fine-grained marine unit. The Siltstone is late Early Permian in age (Kungurian) and is younger than the Tallong Conglomerate (Sakmarian to Artinskian) and was deposited past the peak of the Gondwanan glaciation, but there was still ice in the landscape (Fielding et al, 2008).

In addition to scattered dropstones, the Wandrawandian Siltstone preserves a variety of fossils that have been described as a cold-water fauna. These include crinoids (sea lilies), bryozoans, brachiopods, and molluscs; as well trace fossils of tracks and feeding trails left behind by creatures that lived on the seafloor and in the sediment some 270 million years ago. Another indication that the ice was not too far away is the occurrence of glendonites – pseudomorphs after ikaite, mineral carbonate crystals that grew within cold (<7°C) soft mud of the seabed (Thomas et al, 2007).

Dropstone in Wasp Head Formation on Emily Miller Beach, South Durras. Image courtesy Mike Smith.

Base of Stage in millions years	Period	Stage	Rock unit		
251	TRIASSIC	Induan			
	END PERMIAN MASS EXTINCTION				
253.8	PERMIAN	Changhsingian			
260.4		Wuchiapingian			
265.8		Capitanian			
268		Wordian			
	GONDWANAN GLACIATION WANING – COAL DEPOSITION EXPANDS				
270.6		Roadian			
275.6		Kungurian	Wandrawandian Siltstone		
284.4		Artinskian	Tallong Conglomerate	Youlambie Conglom.	Darlington Lmst.
294.6		Sakmarian			
299.0		Asselian	Wasp Head Fm.		
	CARBONIFEROUS	Gzheilian			
		GONDWANAN GLACIATION BEGINS			

Permian age stages, rock units and events. Subdivision of the Permian according to the ICS, as of 2021.

Wandrawandian Siltstone, Ulladulla, showing (left) trace fossils and molluscan shell and (right) a pseudomorph after glendonite crystal that grew in the soft sediment. Images courtesy Marita Bradshaw

On the rock platform at Ulladulla, you can step back into the icy world of Gondwana by taking a Guided Fossil Walk, recommencing in December 2021. Please see the website for details www.gondwanacoastfossilwalk.com.au.

Basal Beds (Darlington Limestone) Fossil Cliffs, Maria Island, Tasmania

The Gondwanan continents shared not only ice sheets but also the cold-water fossil *Eurydesma*, a big, thick shelled bivalve that has been recorded in Permian glacial deposits from Australia, India, South Africa and South America (Runnegar, 1979). One of the most spectacular outcrops of these fossils is to be found on Maria Island, Tasmania. Here the shells of *Eurydesma,* spiriferid brachiopods and other marine invertebrates are so densely packed that they were once mined for cement. Among the shells are occasional cobbles of granite and other rocks. The shells beds are interpreted as subtidal shell banks that accumulated during a waning phase of the Permian glaciation, when there was still occasional sea ice (Fielding et al, 2010; Isbell et al, 2013). This world-class fossil site is now within the Maria Island National Park and can be accessed on a walking trail, please see the website for details https://parks.tas.gov.au/explore-our-parks/maria-island-national-park/fossil-cliffs.

Another place to see the story of Australia under ice is Hallett Cove, a coastal suburb of Adelaide, South Australia. An interpretative walking trail that leads the visitor through the geology that displays both erosional (ice-polished Neoproterozoic bedrock pavements) and depositional evidence (Cape Jervis Formation diamictite) of the Gondwanan glaciation (Preiss, 2019). Details about the Hallett Cove Conservation Park can be found at this website https://www.parks.sa.gov.au/parks/hallett-cove-conservation-park .

In Queensland, Late Carboniferous to Early Permian glacial sediments are recognised in the Bowen and Galilee basins, and in the Yarrol Block of the New England Fold Belt where the polymictic Youlambie Conglomerate outcrops. This conglomerate was deposited in the Early Permian (Asselian to Sakmarian) as a glacier advanced into a lake system (Jones & Fielding, 2004).

Darlington limestone, Maria Island, showing Eurydesma shells. Image courtesy Marita Bradshaw.

Near Bacchus Marsh, Victoria there is outcrop of glacially influenced sediments that include diamictite, massive sandstone, interbedded dolomitic sandstone and siltstone, and matrix-supported conglomerate. These are facies of the Bacchus Marsh Formation which was deposited in the late Sakmarian an inland sea that developed as the ice sheets retreated southwards (Webb & Spence, 2008).

The extensive ice sheet that covered much of Western Australia in the Carboniferous and Permian delivered thick sediments to the Perth, Carnarvon, Canning, Bonaparte and Gunbarrel/Officer basins. There are examples of striated pavements, diamictites, mudstones with dropstones and possible glacial varves (Mory et al, 2008).

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Genesis of the National Rock Garden

Doug Finlayson, Geoscientist

During 2008 my wife, Caryl, and I attended an International Deep Seismic Profiling Symposium (Seismix 2008) at a cross-country ski centre, Saarriselka, in the far north of Finland, well within the Arctic Circle. While in the country we did a bit of touring using the excellent public transport and soon realised that the Finns take great pride in exhibiting the geology of the country in all its diversity. Many of Finland's rocks, which date from the Archaen Eon, more than 2.5 billion years ago, were exposed after the end of the last ice age about twelve thousand years ago. Like Australia, the mining industry plays a large part in the prosperity of the country. There are collections of rock specimens dotted across Finland for many educational purposes.

Rock specimen display near the Arctic Circle. Image courtesy Doug Finlayson.

While we were watching the sun just above the horizon at a small town on the Arctic Circle, Caryl and I talked about a display somewhere in Canberra for regional rock specimens, and, quick as a flash, Caryl said "why not for the whole of Australia?" Why not indeed. Thus the idea of a National Rock Garden was born.

Geological information in Finnish and three other languages; English, German and French. Image courtesy Doug Finlayson.

The sun at midnight on the Arctic Circle. Image courtesy Doug Finlayson.

During our stay in Finland we took the opportunity visit the city of Tampere, the second largest city in Finland, about an hour's train ride north of Helsinki. In 1820 a Scottish engineer by the name of James Finlayson (no relation) got permission from the Tsar of Russia to build an industrial cotton mill factory using the enormous water resources of many large Finnish rivers to generate electricity and drive mill wheels. At Tempare there are huge 19th Century buildings for the mill and its workers that have now been incorporated into a modern city. Today you can find Finlayson department stores in Helsinki. At one I was asked by the cashier whether I was related to James Finlayson who they regard as one of their own.

Striations in Precambrian basement rocks in a park in the harbour area of Helsinki, evidence of the last ice age. Image courtesy Doug Finlayson.

When returning by train to Helsinki, not far from the city we caught a glimpse of a magnificent display of rock specimens in the forecourt of the Heureka (Eureka) Science Centre, and there and then Caryl and I decided we had to have such a display of rocks from around Australia as a National Rock Garden. On returning to Canberra I gave a talk to the ACT Division of GSA to promote the idea. It took off and the rest is GSA history. More than ten years on, a site is now being developed within the National Arboretum, Canberra.

Heureka Science Centre near Helsinki with about 120 rock specimens from around the country in the outdoor forecourt. Image courtesy Finnish Science Centre Heureka website.

Rock specimens from around Finland in the outdoor forecourt of the Heureka Science Centre, near Helsinki. Image courtesy Doug Finlayson.

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.

Outstanding breccias of Australia

Russ Lord, Geologist/Geochemist

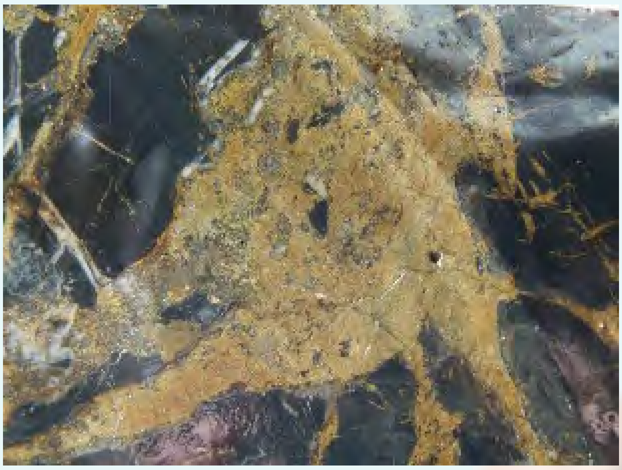
Breccias are central to many ore deposits in Australia and around the world. A breccia is a sedimentary rock formed from angular fragments of pre-existing minerals and rock, generally >2 mm in size, cemented together in a finer-grained matrix. The angular nature of the fragments indicates that they have not been transported very far from their source.

The most widely held interpretation is that ore deposits like Mt Isa and Broken Hill were formed by sediments depositing in grabens, a section of crust that lies between two faults that has lowered relative to the blocks on either side. We see this process happening today at Atlantis II in the Red Sea.

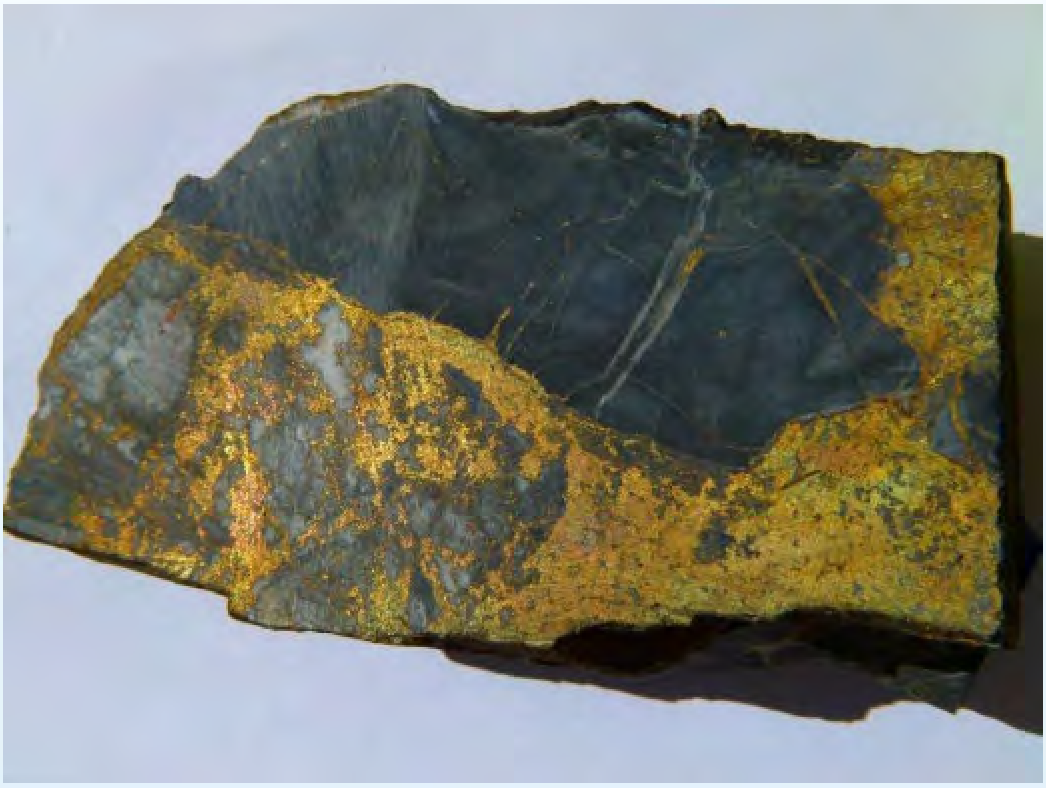
An outcropping mineralised breccia is shown below, up dip from the 1100 copper orebody in Mt Isa.

Geologist Chris Gregory examining a breccia that is the outcrop of the 1100 Cu Orebody at Mt Isa, Queensland. Image courtesy J.R. Lord (1989).

Underground these breccias and fracture zones look like the rocks in the next three pictures.



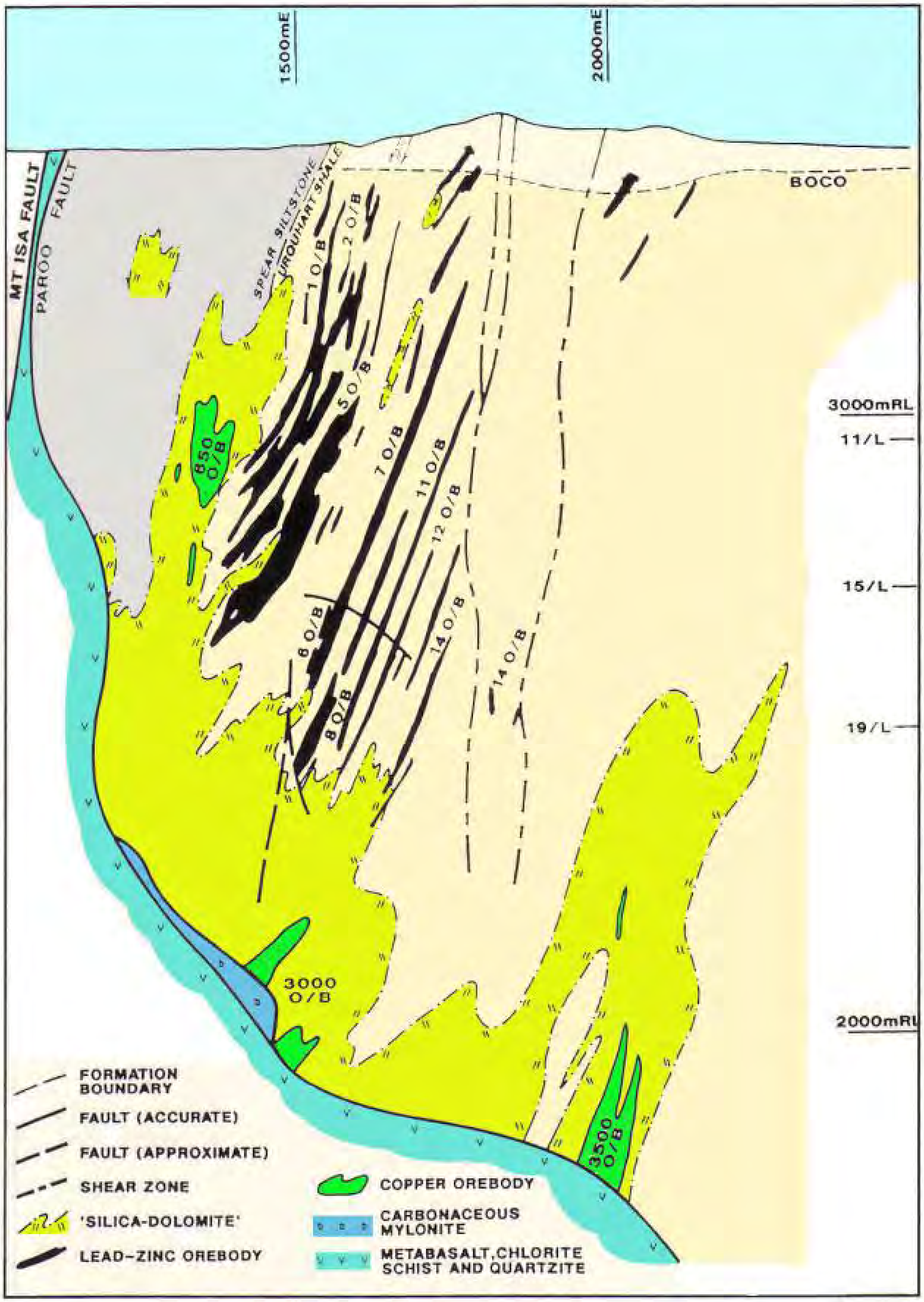
Left: Chalcopyrite with black, fractured siliceous shale or chert clasts in the 1100 Orebody at Mt Isa. Right: Detail of chalcopyrite in silica-dolomite breccia showing clearly discordant mineralisation. Both W.D. Smith specimens. Images courtesy J.R. Lord.



Medium grey carbonaceous chert with fracture fill chalcopyrite and silica (white). WG Perkins specimen. Image courtesy J.R. Lord.

The cross section through the Mt Isa orebodies is very instructive (see next page). It shows the silica-dolomite breccia is widest adjacent to the Paroo-basement or Greenstone Fault, and it progressively thins away from that fault. Likewise the copper orebodies have best grades close to the fault and they decrease away from it. This is a feature not unique to Mt Isa. Other orebodies that demonstrate the same principle are Polaris (Zn) in Canada, Tsumeb (Cu) in Namibia, Carlin (Au) in Nevada, several deposits in east Tennessee (Zn) and several others in Ireland like Lisheen and Tynagh (Zn-Pb).

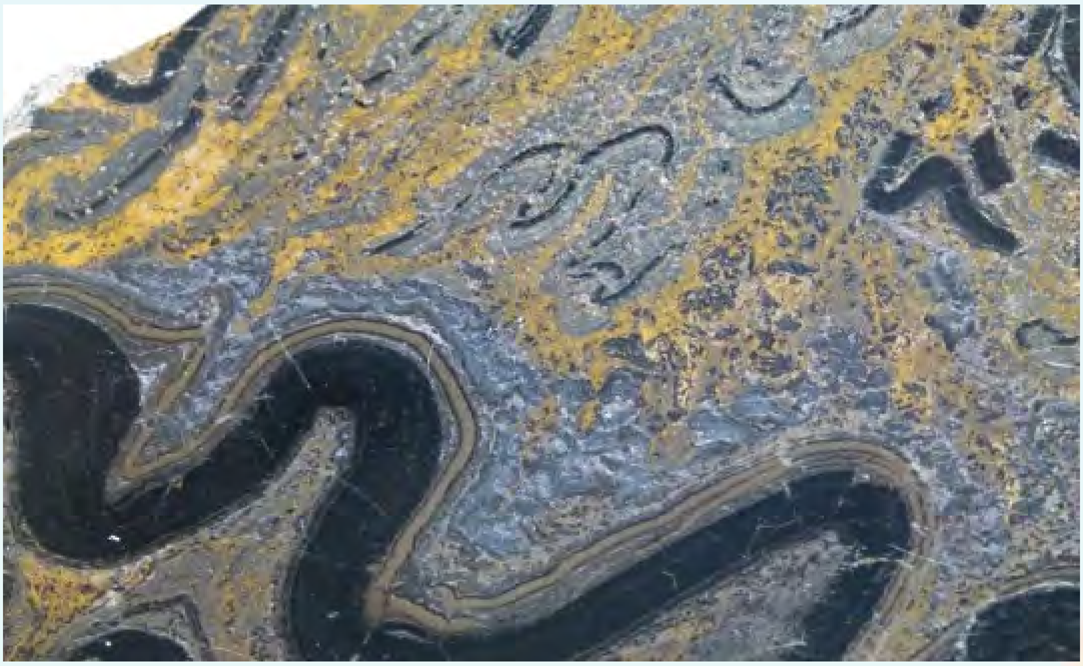
Silica-dolomite invasive into Urquhart Shale with shale clasts disoriented from their original west dipping orientation; 400 Orebody, 9 Level. The photo is looking south. Image courtesy W.G. Perkins.



Cross section through the Mt Isa Pb-Zn and Cu orebodies (after WG Perkins, 1998).

When galena and sphalerite are precipitated between two competent shale beds, and subsequent tectonics is applied with some heat, they behave like jam between two slices of bread. That is what has happened in the pictures below where one smaller black shale bed became macerated into this galena matrix breccia. Small black shale beds are broken into pieces, but bigger ones are more competent, and are simply folded.

Galena remobilised between black shale beds and brecciating the thinner ones between them; MICAF 6910N & 2830 RL. Image courtesy W.G. Perkins.



Crenulated Pb-Zn ore with black shale interbeds. FP XRF readings indicate the following composition: Fe (orange) 32.8%, Zn 6.22%, Pb 2.9% and Cu 0.13%. HG Schmidt specimen. Image courtesy J.R. Lord.

Oxidised copper minerals form breccias of a different sort as illustrated in the breccia specimen below.

Cuprite in breccia from the Black Rock Open Cut at Mt Isa. Image courtesy J.R. Lord.

At Broken Hill, the lead-zinc minerals are generally banded in lenses, but they have been severely folded and highly metamorphosed in areas of complex faulting. In the North Mine, those sedimentary characteristics are destroyed, and breccias are the result. These faulted areas are perhaps analogous to the basement fault in the Mt Isa example.

High grade Pb-Zn in brecciated quartz in the Fitzpatrick orebody at the North Mine, Broken Hill. The rectangles are plates for rock bolts. Image courtesy J.R. Lord.

Breccia from the Fitzpatrick orebody, North Broken Hill Mine, NSW. Image courtesy J.R. Lord.

These two famous deposits at Mt Isa and Broken Hill are outstanding examples of major mineralised breccia zones in areas that were once grabens or spreading centres like the one we see today at Atlantis II in the Red Sea.

Rocks recycled and mistaken identity

Ken McQueen, National Rock Garden Steering Committee

Rocks used for building stone or in monumental applications are frequently recycled. The Mount Gibraltor Microsyenite, one of the iconic rocks featured in the National Rock Garden (NRG), was used extensively in the Queen Victoria building, constructed in George Street, Sydney from 1893–1898. During subsequent renovations of the building in 1916 some internal granite columns were removed and sold. One of the hand-sculptured columns was purchased by Beckinsale's monumental masons in Lismore where it was retained for some time. Eventually the column was donated to the Ballina Ex-Servicemen's Home in Ballina as a memorial and erected at the northern end of Owen Street, Ballina in 1961 (Anon. 2008). Interestingly, over the long period of storage the identity of the rock making up the column became confused and when it was erected it was labelled as Moruya Granite (Tonalite) another iconic rock featured in the NRG and also widely used for monumental purposes.

Left: The recycled column of Mt Gibraltar Microsyenite at the end of Owen Street, Ballina. Now a memorial to all ex-servicemen. Right: Descriptive plaque with the mistaken identity of Moruya Granite. Images courtesy Ken McQueen.

The identity of the rock as Mount Gibraltar Microsyenite was revealed during a close inspection of the column by the author in October 2021.

Close up of the column rock revealing its true identity. Image courtesy Ken McQueen.

Polished columns of Mount Gibraltar Microsyenite at the York Street entrance to the Queen Victoria Building, Sydney. Image courtesy Mike Smith.

The Mount Gibraltar Microsyenite (known commercially as the Bowral Trachyte) was mined at Mount Gibraltar (the Gib) near Bowral (Lemann et al., 2007). It was prized by stone masons for its qualities of dense strength and durability. As well as being used in the Queen Victoria Building it was also used in Challis House in Martin Place, the ANZAC Memorial in Hyde Park and the 1901 Commonwealth Stone in Centennial Park. It was used for the Canberra foundation stone, for many war memorials and in Australia House in London. It was also quarried for ballast in construction of the Great Southern Railway line from Mittagong to Goulburn.

The Canberra foundation stone. Image courtesy Brad Pillans.

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WE WOULD REALLY APPRECIATE 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 is initiating the Landscape Design process, for which we have already selected a contractor with strong experience within the Arboretum.

Please make a tax deductible donation:

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Please mail/email this information to: National Rock Garden Trust Inc. c/- Geological Society of Australia, Level 2, Peats Ferry Road, Hornsby, NSW 2077

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 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 phone (02) 9290 2194.

Join our mailing list

The newsletter is circulated twice a year, ordinarily March and September. New “friends” are welcome and can be added to the email circulation list by contacting the editor.

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

Newsletter compiled and edited by Michelle Cooper.