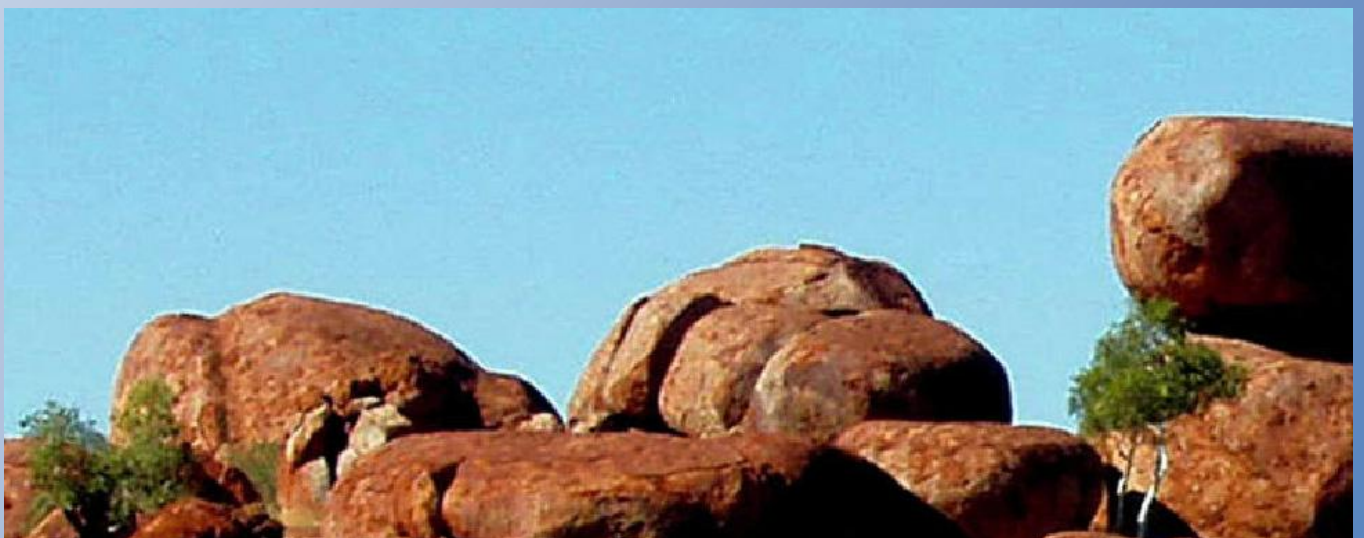


National Rock Garden

Celebrating the Geological Heritage of Australia

Newsletter No. 7

**Federation Rocks Inauguration
20th October, 2013**



www.nationalrockgarden.org.au

A bit of history

Extracts from the Adelaide Advertiser, 13 March, 1913

“I desire to convey greetings from the people of Australia to your Majesty and announce that I have today laid the foundation stone of the Federal capital city, and that Lady Denman has named it “Canberra.”

This was the dispatch sent by Lord Denman, then Australia’s Governor General, to King George V in London immediately on the conclusion of the ceremony to do honor to the occasion of the naming of the Federal Capital and the commencement of its memorial column.



NLA Photo image pic-vn4699513

**Note the use of the words
“memorial column”.**

Earlier during the ceremony the Prime Minister, Andrew Fisher said –

“It is now my pleasure and privilege to invite his Excellency to lay the foundation stone of this column on behalf of the people of Australia.”

The base of the Commencement Column of the capital city was thus completed and it was anticipated that there would be a column built on top of the base at some future date.

Nineteen years later, an extract from the Canberra Times of 8 November 1932, reported -

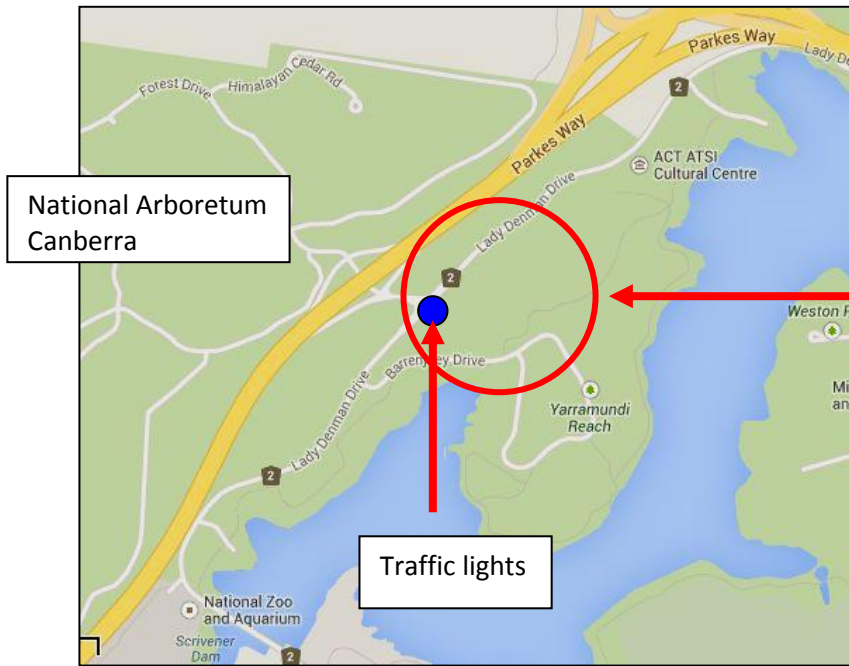
“It had been intended that the column should be constructed of stones sent from every part of the Empire.”



The Foundation Stone, 2013, in Federation Mall, Canberra, between Parliament House and Old Parliament House.

The column with stones from around the “Empire” for the Canberra Foundation Stone was never built.

Hence the genesis of the idea for the “Federation Rocks” for the National Rock Garden on the occasion of the 100th anniversary of the naming of Canberra.

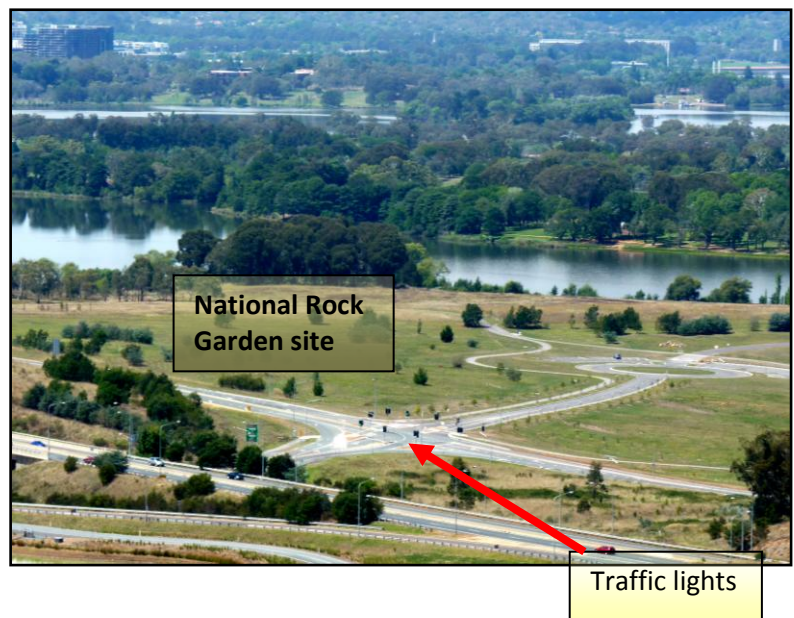


The National Rock Garden site – getting there.

The NRG site is on Barrenjoey Drive at the western end of Lake Burley Griffin. There are traffic lights on Lady Denman Drive that lead to the new entrance and to a parking area. There are large road signs.

The Federation Rocks Inauguration – an invitation

Friends of the National Rock Garden and the general public are cordially invited to join other guests at the inauguration of the Federation Rocks at the National Rock Garden site at 10.30 am on Sunday 20th October. The ACT Chief Minister, Katy Gallagher MLA, will officially open the Federation Rock display and Matilda House will conduct a Welcome to Country on behalf of the Nggunnawal Traditional Owners. It is suggested that guests arrive before that time because parking is limited.



In recent months the National Rock Garden Steering Committee has been very active getting all States and Territories to donate a Federation Rock to commemorate the naming of Canberra as the capital city of Australia one hundred years ago. The ACT Chief Minister, Katy Gallagher MLA, is to be congratulated in taking the lead in bringing the project to fruition with the cooperation of State and Territory Heads of Government.

Federation Rocks - descriptions

NORTHERN TERRITORY

Mount Goyder Syenite

AGE: Proterozoic, 1825 million years

LOCATION: Mt Bunday Quarry, 120 km SE of Darwin

FORMATION: A low silica variety of granite, this plutonic rock formed from slowly cooled magma at great depth. It is thought that such magmas arise from partial melting of potassium-rich rocks at the base of continental crust, often associated with subduction zones. This rock features large red crystals of orthoclase feldspar in a finer matrix (“porphyritic texture”).

SIGNIFICANCE: This decorative stone is the red “granite” widely used in Darwin buildings, including Parliament House and the Supreme Court.

Donated by the Government of the Northern Territory and Boral Quarries Mt Bundy.



QUEENSLAND

Chinaman Creek Limestone

AGE: Devonian, 390–400 million years

LOCATION: 220 km west of Townsville

FORMATION: This limestone was formed from calcareous mud that accumulated in a tropical, shallow marine environment on the east Australian continental margin. It contains abundant fossil bivalves, corals, sponges and brachiopods, including shells of giant megalodont clams, many of which are preserved in their upright growth position.

SIGNIFICANCE: This abundantly fossiliferous limestone can be regarded as a Devonian precursor of the Great Barrier Reef, Queensland’s spectacular



most iconic natural feature. A decorative stone, it is being exported around the world. Other Devonian limestone is extensively used in the manufacture of cement.

Donated by the Government of Queensland & NQ Marble Pty Ltd.

AUSTRALIAN CAPITAL TERRITORY

Canberra limestone

AGE: Mid Silurian, 430 million years

LOCATION: Central Canberra

FORMATION: This limestone formed in warm, shallow, tropical seas on the margin of continental Australia, then a part of the Gondwana supercontinent. Marine life was abundant. The limestone is a minor, but distinctive rock unit within the sandstone, siltstone & mudstone of the Canberra Formation. It contains occasional fragments of coral and shell washed in with other sediments.

SIGNIFICANCE: Outcrops of this rock along the Molonglo River gave the Canberra region its early European name of 'Limestone Plains'. Most of these limestone outcrops are now covered by the waters of Lake Burley Griffin.

Donated by the Government of the A.C.T. & the Department of Defence.

NEW SOUTH WALES

Hawkesbury Sandstone

AGE: Middle Triassic, 237–245 million years

LOCATION: Pyrmont, Sydney

FORMATION: In the Middle Triassic, braided rivers carried vast quantities of quartz-rich sands, from the south and west, into what is now the Sydney region. The sands compacted and hardened to become an extensive sandstone formation.



SIGNIFICANCE: Hawkesbury Sandstone dominates the scenery around Sydney. Its surface preserves many Aboriginal carvings and paintings. This “quarry block” is from a re-opened portion of the “Paradise” Quarry, one of the most famous 19th century quarries in Pyrmont, which supplied “yellow block” sandstone for the construction of many landmark historic buildings in NSW.

Donated by the Government of New South Wales.

WESTERN AUSTRALIA

Banded Iron Formation

AGE: Archean-Proterozoic, 2,450-2,730 million years

LOCATION: Pilbara Region

FORMATION: This rock was deposited from dissolved ferrous iron in the circulating waters of an early global ocean under a reducing atmosphere. The alternating bands show the marine environment see-sawing between oxygen rich (dissolved iron precipitates) and oxygen poor (silica precipitates), as the activity of early cyanobacteria varied.

SIGNIFICANCE: It is the distinctive, spectacular precursor of the globally significant Pilbara iron ore deposits and thus one of Australia’s most important rocks. The Hamersley Group BIFs are the best exposed, least metamorphosed and least deformed BIFs on Earth and contain the world’s largest concentration of iron—approx. 150 000 000 000 000 tons.

Donated by the Government of Western Australia and Rio Tinto Australia

TASMANIA

Tasmanian Dolerite

AGE: Middle Jurassic, 175 million years

LOCATION: Leslie Vale, near Mt Wellington, south of Hobart,

FORMATION: During the breakup of Gondwana, dolerite magma was injected as dykes and sills (sheets) into thick sedimentary rocks, covering most of Tasmania. As they cooled and crystallised, regular vertical cracks propagated through the sills forming polygonal columns and the iconic “organ pipes” landscape above Hobart and elsewhere in Tasmania.

SIGNIFICANCE: Dolerite is unusually widespread in Tasmania, and is referred to as “the rock that made Tasmania”. Altogether, these multiple sills comprise one of the world’s largest magma intrusions. The presence of the same dolerite sills in Antarctica and South Africa contributed to our understanding of the breakup of the Gondwana supercontinent, of which Australia was the easterly part.

Donated by Mineral Resources Tasmania and Hazell Bros Resources

SOUTH AUSTRALIA

Oorlano Metasomatite

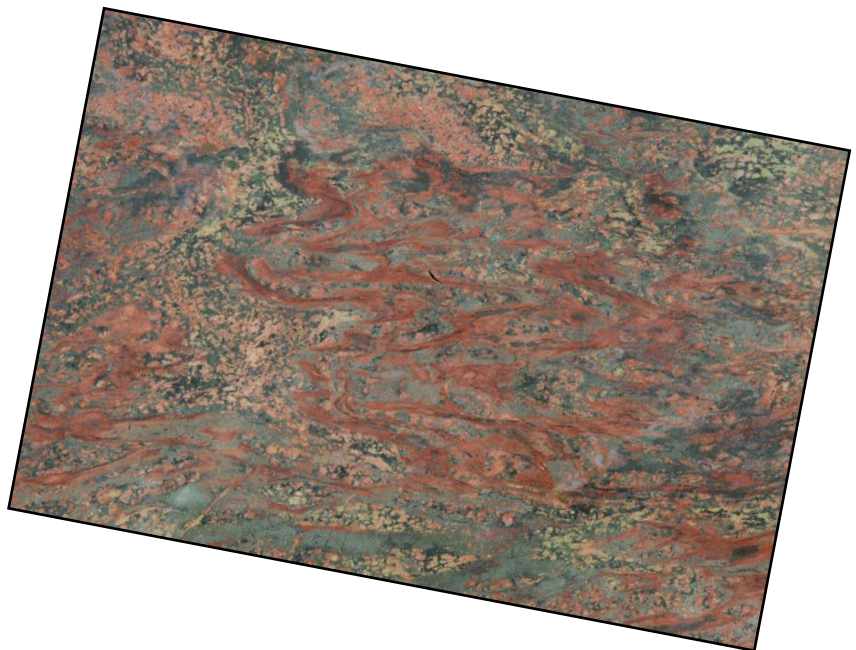
AGE: Proterozoic, 1760 Ma (deposition of sediment) to 1575 Ma (alteration)

LOCATION: Wallaroo, Yorke Peninsula, SA

FORMATION: The heat and fluids from granite intrusions formed this distinctive calc-silicate gneiss from calcareous sedimentary rocks. The colourful minerals include epidote, actinolite and diopside (green); feldspar and haematite (orange and red) and magnetite (black). Quartz-dolomite veins include pyrite and copper-bearing chalcopyrite.

SIGNIFICANCE: This spectacular and valuable “Harlequin Stone” is a widely exported dimension stone but it also expresses the geological event that formed the giant Olympic Dam orebody and the historic Moonta and Wallaroo copper mines. Its geological history guides further mineral exploration.

Donated by the Government of South Australia.



VICTORIA

Bendigo metasandstone

AGE: Ordovician to Silurian, 440-460 million years

LOCATION: Bendigo

FORMATION: This rock's complex history began with deposition of layers of sand and mud in the ocean off ancient eastern Australia. Immense upheavals, with heat and pressure, then folded and metamorphosed the sediment pile to form metasandstone and slate. This rock contains white quartz veins with pyrite and small grains of gold that formed from hot fluids that were injected into the slate.



SIGNIFICANCE: This rock is typical of the famous Bendigo Goldfield, which yielded vast riches during Victoria's gold rushes of the 19th and 20th centuries.

**Donated by the Government of Victoria and
Unity Mining Ltd**

The rock described below is used for the plaque unveiled by the ACT Chief Minister, Katy Gallagher, on 20 October, 2013.

AUSTRALIAN CAPITAL TERRITORY

Mount Painter Volcanics

AGE: Mid Silurian, 430 million years

LOCATION: Central Canberra

FORMATION: Dacitic ignimbrite, this rock formed from the consolidation of ash clouds and other extrusive rocks violently erupted from volcanoes that lay to the west of the Canberra region on the margins of the Australian continent.

SIGNIFICANCE: It forms the bedrock beneath the weathered soil cover of the National Rock Garden.

**Donated by the Government of the Australian Capital
Territory.**



ANOTHER ROCK FROM WESTERN AUSTRALIA

Stromatolite, Tumbiana Formation

AGE: Archean, 2720 million years

LOCATION: Disused quarry beside the road and railway south of the Redmont railway camp, Pilbara

FORMATION: The layers visible in this limestone were built mainly by cyanobacteria (formerly known as blue-green algae) that converted Earth's atmosphere from one dominated by carbon dioxide and nitrogen to one with breathable oxygen. Microbes on the bottom of a shallow lake trapped and bound sediment and precipitated calcium carbonate which hardened to rock.

SIGNIFICANCE: Stromatolites are some of the earliest life forms on the planet and key fossils for understanding the evolution of life. They are abundant in rocks older than 500 million years in WA. Living examples at Hamelin Pool, Shark Bay are world renowned.

Although not one of the Federation Rocks, we do have another very significant rock from Western Australia in Canberra at the National Museum of Australia



The National Rock Garden is now on Facebook

***Want to keep up with the latest news, rock movements,
rocks of the month and a whole lot more?***

Get onto Facebook!



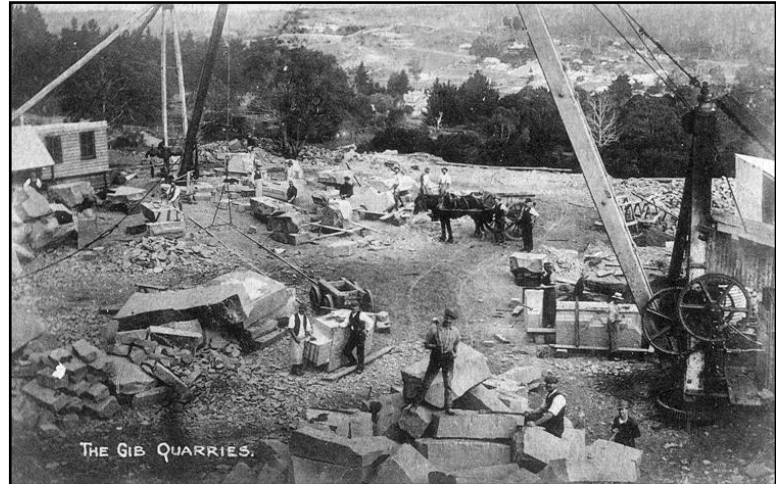
<https://www.facebook.com/pages/National-Rock-Garden>

Dimension stone used for the Foundation Stone, Canberra.

The rock for the Foundation Stone is from the (now disused) Mount Gibraltar quarry just outside Bowral, New South Wales. The rock is known commercially as Bowral Trachyte; more correctly it is a plutonic rock called microsyenite.

This microsyenite is a Jurassic volcanic intrusion into the Triassic Hawkesbury Sandstone of the Sydney Basin. It cooled and solidified to form a beautiful building stone. After 180 million years of erosion the intrusion has been exposed at the surface.

The Foundation Stone was designed by the Chief Government Architect, John Smith Murdoch. It was relocated in 1988 after the construction of Parliament House to its present position near the original position, which was at Camp Hill, just below Capital Hill.



Mount Gibraltar Quarries, Bowral, were used consistently for 100 years of quarrying, from 1886 to 1986. The bulk of Bowral Trachyte was transported to Sydney and is incorporated in major city buildings including Challis House, Martin Place; the National Mutual Building, George Street; the Queen Victoria Building, George Street; the ANZAC Memorial, Hyde Park and in major public works such as the Hawkesbury River Bridge at Brooklyn.

In Canberra the Bowral Trachyte has also been used to construct the balcony walls round the Australian National Library and in parts of the Treasury Building. In London, UK, it is incorporated in the Australia House building.



Mount Gibraltar, 2013



Feedback and further information

The Geological Society welcomes feedback and suggestions on the development of the National Rock Garden. See the feedback boxes on the National Rock Garden web site –

www.nationalrockgarden.org.au

Tax deductible

The National Rock Garden has Deductible Gift Recipient status, which means all donations are tax deductible. You can make a donation directly through the website:

<https://www.nationalrockgarden.org.au/support-us/make-a-donation/> or you can phone (02) 9290 2194 and we can assist you.

Sponsoring the National Rock Garden

Building the National Rock Garden is a long-term project and 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. To make the garden a reality we need major donors and sponsors to work with us as we build this national monument in the nation's capital.

We need sponsors and benefactors for long-term relationships. If you or your organisation would like to be financially involved, please contact Prof. Brad Pillans, brad.pillans@anu.edu.au or Sue Fletcher, sue@gsa.org.au, alternatively phone (02) 9290 2194 to seek more information.


Newsletter – compiled by:

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The newsletter is usually circulated twice a year, Dec/Jan and June/Jul. However, on this occasion a newsletter has been issued on the occasion of the inauguration of the Federation Rocks at the National Rock Garden site at the western end of Lake Burley Griffin, Canberra.

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 web site



National Rock Garden

Celebrating the Geological Heritage of Australia

To recognise, acknowledge and celebrate Australia's rich geological heritage in a parkland setting within the nation's capital, and demonstrate to present and future generations of Australians the diversity of the rocks and minerals that contribute so significantly to the nation's landscapes, heritage and prosperity.

www.nationalrockgarden.org.au