

Dorvalis

Friends of Bendigo Botanic
Gardens Inc. Newsletter

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From the President

The Growing Friends are now back in the gardens every Tuesday with only minimal COVID-safe restrictions. We have had a highly successful clearance sale in the nursery and are busy propagating for the November 2021 sale. The augmented garden staff has of course kept the gardens looking good over the last year, but there will be plenty for us to do over the winter weed growing season. The Illustrators group has also returned on Saturdays and Wednesdays without limit on numbers. Looking forward to seeing you all.

Anne Bridley, FBBG President.

Update on Future Developments for the Gardens.

Aaron Lindsay - Coordinator Public Space Design (CGB)

The Central Hub

The tenders have closed for construction of the Central Hub and the City is currently in the process of short listing a preferred contractor. We hope to have a contract executed by May and construction in progress in June with the opening of the precinct in July 2022.

We are continuing to collaborate with Dja Dja Wurrung and are currently working toward providing indigenous naming for the precinct which will replace the current working title of the Central Hub.

Signage

In May we will be installing interpretive signage into the Garden for the Future which will provide information on the design and plants. In addition to this we will be providing more way-finding signage to help visitors better navigate between the Heritage Gardens and the Garden for the Future.

It has been really rewarding seeing the increase in use of the GFTF this summer. The BBG is now our busiest park for event bookings.



*Aaron's
departure to WA.
See last page*

Proposed plan for Central Hub area.



The Children's Garden Autumn 2021

This newsletter is named after *Dorvalis caffra*, the South African Kei Apple Tree which is a heritage listed tree in the Bendigo Botanic Gardens

THE EDEN PROJECT

by Pam & Anthony Sheean (FBBG members)

As a part of our Garden Tour in 2019, we continued on from France to England, where we visited some beautiful gardens and made a special effort to travel down to Cornwall to visit the Eden Project.



The Eden Project is a UK-based educational and environmental charity and social enterprise. Located in southern Cornwall, the Eden Project is tucked away in what was once a huge china clay pit. Created in 1999, massive biomes house the largest indoor rainforest, a Mediterranean garden with close to 1,000 plants from the warm temperate regions and outdoor gardens covering 20 acres with over 3,000 plant species represented.

The Eden Project embraces the importance of plants and their interaction with human kind. On arrival at the Project you enter via the



Core, an educational building whose design reflects nature's architecture or biomimicry. The Seed, an enormous granite sculpture within the core, created by Peter Randall-Page references the Fibonacci sequence and golden proportion as seen in pinecones and sunflowers. The philosophy of the project embraces renewable energy, ethically sourced materials, recycled materials, water saving measures and waste reduction. The overriding drive is to present stories and experiences in such a way as to engage and inspire all who visit to live more sustainably.

In the Mediterranean biome, the Western Australian garden features banksias, everlastings and grass trees. There is a perfume and herb garden inspired by Moorish gardens and a South African garden featuring those native plants that are adapted to thrive on drought and poor thin soils.



THE EDEN PROJECT continued

The rainforest biome is a vast humid indoor jungle, with towering palms, a canopy walkway, numerous educational displays and an actual waterfall. Lush ponds are filled with hundreds of tropical plants.



A Malaysian home and garden or kampung, provides year-round food, with herbs and flowers, vegetables and fruit, as well as building materials and medicine.

The outdoor gardens are full of paths that twist and turn up and down the slopes of the pit. There are breathtaking views of the Biomes and gardens and landscapes featuring everything from sculptures to beautiful ornamental flowers and crops used for medicine, fuels, materials and food.



The Eden Project are working with a variety of international partners to establish a sisterhood of new Eden Projects around the world, with the ambition to have a presence on every inhabited continent.

One such Project is Eden Project Anglesea, with planning in place for a world class eco-tourism attraction on the site of the former Alcoa coal mine. The aim is to fuse science and fun to engage visitors in the elements of fire, air, earth and water that are responsible for shaping the coastal region along the Great Ocean Road. Certainly worth a visit when the project is complete.

Once upon a geological time the sea was as close to Bendigo Botanic Gardens as Epsom and Huntly

By Eric Wilkinson (FBBG member and retired geologist)

In the Autumn 2020 issue of *Dovyalis* I wrote about the upside-down relationship between the White Hills and the Bendigo Botanic Gardens. Just to remind you, the White Hills Gravels which now cap the White Hills were deposited in an ancestral Bendigo Creek in Late Cretaceous times, and the area of the future Bendigo Botanic Gardens was on high ground of Ordovician bedrock on the western side of the valley. Through the Palaeocene and early Eocene this relationship was reversed. The gravels, which had become cemented by silica and iron oxide, were much more resistant to erosion and had become the high point of the landscape, with a new Bendigo Creek valley to their west, and Back Creek to their east. The erosion of these new valleys was where I ended the geological history of the Bendigo Botanic Gardens in the previous article.

The Huntly Deep Lead

These newly eroded valleys received an influx of coarse gravel when uplift was renewed in the Early Tertiary Period, some of which was derived from erosion of the White Hills Gravels. These new gravel deposits also contained rich alluvial gold. Similar auriferous gravel deposits of the same age are found in other ancestral stream valleys preserved across the northern slopes of the Victorian Highlands. They were known as "Deep Leads" by early gold miners, and our local example is the Huntly Deep Lead, which was mined for gold from Epsom through Huntly to Bagshot from the 1860s to the 1880s. The gravels dropped sharply by about 15 metres where the Huntly Deep Lead crossed the Whitelaw Fault at White Hills. Beyond Huntly it had a course quite different to the modern Bendigo Creek. It lies south of the low hills crossed by the Midland Highway between Huntly and Bagshot, whereas the modern Bendigo Creek lies to the north.

The heaps left by the gold miners show the course of this older valley south of the highway. Further evidence of this course has come from fortunate water bores which reached gravels with potable water in places shown as Ordovician bedrock on older geological maps.

The equivalent alluvial deposits in the ancestral Loddon Valley were given the name **Calivil Formation** by Phil Macumber in 1973, and this formation name applies to the alluvial deposits of the Huntly Deep

Lead. He believed the **Calivil Formation** to be of the Pliocene period, and therefore around 5 million years in age. However, stream activity had diminished through time and the gravels of the Deep Lead valleys had been succeeded by sands and clays, including carbonaceous clays with plant remains. Palynological studies of such carbonaceous clays encountered in bores in the Loddon Valley from 1977 onwards revealed pollen grains which were Late Eocene to Early Oligocene in age, and therefore about 35 to 40 million years old, so the **Calivil Formation** followed the White Hills Gravels down to a much older age than originally assigned.

Incursion of the sea into the Murray Basin, and deposition of marine sediments

Regional subsidence in the Murray Basin in Late Oligocene times allowed the sea to enter the greater part of the Murray River Valley. At its maximum extent this sea was deep enough to just about cover Pyramid Hill. At the northern edge of the highlands the sea extended into stream valleys as shallow estuaries, possibly fringed with mangroves, and came as close to Bendigo as Huntly and Epsom. Marine sediments with worm burrows were deposited above the alluvial sediments of the Huntly Deep Lead in the Bagshot and Huntly area in just such an environment.



Marine sediments of the Bagshot Formation exposed on the Midland Highway between Huntly and Bagshot, a short distance west of the Bagshot railway crossing.

Once upon a geological time.... cont'd

These worm burrows were first recognised by Don Cherry when he was assisting me with completion of the Bendigo 1:100,000 geological map in the early 1990s. Don was mapping along the Bendigo Creek between Bagshot and Goornong and came across an outcrop of sandstone with tightly packed vertical tubes which he recognised to be worm burrows, an example of bioturbation.

A closer examination of similar deposits fringing the hills of Ordovician bedrock in the Bagshot area brought to light other examples of worm burrows, some more convoluted and irregular and therefore left by a different kind of worm. Worm burrows provide evidence of a marine environment even though no marine fossils have been found. Don and I introduced the name **Bagshot Formation** for these deposits in our Bendigo 1:100,000 geological map explanatory notes in 1994. There is a good example of sandstone with worm burrows to be seen at the eastern end of the cuttings on the Midland Highway west of the Bagshot railway crossing, and this cutting is shown in the first photo. There is also a closeup photo of the worm burrows.

Uplift of the highlands in the early Miocene led to a partial retreat of the sea from the Murray Basin, and Bendigo Creek had to establish a new course across the newly exposed marine sediments which had entirely covered its old course. This is when it created a course to the north of the hills of Ordovician bedrock between Huntly and Bagshot, cutting its way down through the marine sediments of the Bagshot Formation. During Late Miocene and Early Pliocene times, around 7 to 5 million years ago, the sea extended into the Murray Basin again, although this time it did not come closer to Bendigo than Boort, where marine fossils have been found in a formation known as the **Parilla Sand**. Towards the end of the Pliocene another episode of uplift of the highlands led to a progressive retreat of this Late Tertiary sea back to the lower reaches of the Murray River Valley, principally in South Australia.

Late Tertiary volcanic activity

The late stages of the geological history of the Bendigo region include volcanism in the Late Tertiary Period, although the Bendigo Creek valley was not directly impacted. There were basalt flows down the ancestral Campaspe River from about 5.5 to 4.5 million years ago. These flows are believed to have been extruded from Green Hill near Kyneton. The basalt flows forced rivers to find new courses along the margins of the basalt, which is very nicely illustrated at Twin Rivers, where the Campaspe and Coliban Rivers provide a good example of twin lateral streams. The gradient of these basalt flows is steeper than that of the present Campaspe River. The top of the flow is elevated by around 30 m at Twin Rivers, is at river level at Barnadown, and is about 30 m below the surface in water bores at Avonmore. The closest volcano to Bendigo is Bald Hill at Woodstock. This small, eroded remnant of an extinct volcano was the source of extensive basalt flows which buried the ancestral Loddon River (the Loddon Deep Lead), and drastically altered the course of the river by shifting it to the western margin of the lava flows. These lavas were not as viscous as the Coliban-Campaspe River flows, and have a rough topography known as stony rises. These flows have been dated at 1.6 million years in age, right at the base of the Pleistocene Period.



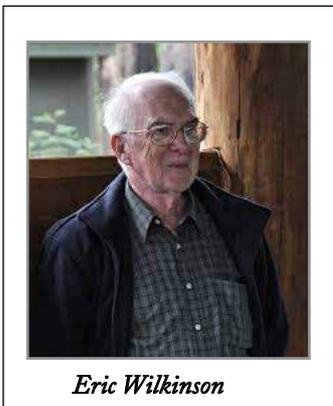
A closeup of the convoluted worm burrows evident in the Midland Highway cutting.

Once upon a geological time cont'd

Accumulation of alluvial sediments in the Murray River Basin in the Quaternary Period.

More regional uplift at the end of the Pliocene led to the final retreat of the sea from the Murray Basin, and accumulation of extensive alluvial deposits across the Murray Valley known as the **Shepparton Formation**. It forms the bulk of the alluvium of both the highland valleys and the riverine plains. Because it is old enough to have been oxidised it is often referred to informally as **red-brown earths**.

In their natural, unmined state, the alluvium of the valleys of the Bendigo Goldfield mostly belonged to the **Shepparton Formation**, and that would have included the flood plain on which the Bendigo Botanic Gardens is largely situated. This old alluvium can be seen in the east bank of the creek just north of the Scott St bridge. In much more recent times (geologically speaking) there was another minor uplifting event and streams were incised down into the older alluvium, and new alluvium deposited in these incised parts of the valley. These deposits are unoxidised, are grey in colour, and are known as the **Coonambidgal Formation**. The Bendigo Creek valley has been so disturbed by mining that this simple stratigraphy is not always evident, as is the case in the Bendigo Botanic Gardens, which have been affected by the huge volumes of sludge sent down the creek in the early days of mining, the result of "puddling" of the alluvium by hundreds of miners. This sludge is the subject of a 2019 book by Susan Lawrence and Peter Davies, entitled "Sludge: Disaster on Victoria's Goldfields", published by Latrobe University Press.



Eric Wilkinson

FBBG Illustration Group

The Illustrators, although not being able to meet in the last 12 months, have been busy producing works of art inspired by nature and displaying these works in several exhibitions.

Nine members contributed to The Custom House Gallery, Echuca, in December, 2020.

Titled 'BENDIGO BOTANICS'

Contributing artists

Audrey Baillie

Annie Clark

Catherine Hayman

Don Leversha

Judie O'Donnell

Jan Orr

Rod Orr

Pam Sheean

Joan Sullivan

Opening on December 4th and running for a month, several works were sold with much interest and appreciation for the meticulous observation and drawing.



The Illustrators are currently exhibiting at the St Arnaud Railway Hub from 10th April to the 7th June.

Titled 'NATURALLY INSPIRED'

Contributing Artists

Audrey Baillie

Annie Clark

Joy Clusker

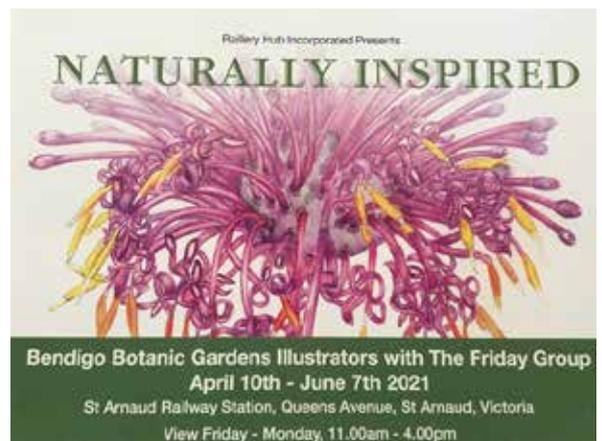
Don Leversha

Judie O'Donnell

Pam Sheean

Joan Sullivan

Partnering with Nick Truscott's Friday Group, the exhibition was launched on the 10th April and features a mix of mediums, styles, formats and nature inspired subjects. By exhibiting these works the artists are able to express the beauty of the natural world, highlight endangered or vulnerable species and educate the community about local flora and fauna.



Get to know our Illustrators

Joan Sullivan



Joan has had a long standing interest in native plants. She has been a member of a native plant group for about 15 years and has studied plant identification.

"I heard about the Illustrators through Bendigo Native Plant Group, now APS Bendigo, of which I am still a member, and U3A Bushwalkers, with whom I walked for about 12 years."

Plant identification requires meticulous observation of the plant details, particularly the flowers and fruit. She felt that botanical illustration, where a key focus is recording the plants accurately, would be most beneficial for identification. Since joining the group in 2014 she has worked with a variety of mediums and although not really being involved in art illustration since school days has developed a keen interest. Her work shows delicate details and captures the character of the plants, mainly in watercolour but also with pencil drawing. Her particular interest is the drawing of Australian native plants, many of which she has in her own garden.

In-house assistance and workshops as well as visiting tutors have enhanced her skills. Excursions to gardens and galleries with the group have been enjoyable and her work has been in several art exhibitions including a current one at St Arnaud Railway Hub where she was the first artist to sell a painting. This exhibition is titled "Naturally Inspired" and runs from April 10th to June 7th 2021.



Bunya Pine (Araucaria bidwillii).
Pencil Drawing



Grevillea calliantha
Pencil Drawing



Bleeding Heart Tree
(*Homalanthus populifolius*).
Watercolour



Eremophila racemosa x maculata
Watercolour

What's on..

Committee Meetings

The monthly committee meetings are held from 9.30am-11.30am on the third Tuesday of each month (except for December) at the Samuel Gadd Centre, Bendigo Botanic Gardens.

Office bearers are elected for 2 year terms and the annual meeting is usually held in August.

Growing Friends

The Growing Friends propagate plants for the gardens and for sale as well as assist the park staff in the gardens. They meet each Tuesday (9.30am-11.30am) at the BBG nursery (behind the Samuel Gadd Centre). Plants are available for sale during Growing Friends times. Two major plant sales are held each year - Spring and Autumn.

Botanical Illustration Group

Meet Saturdays 9:30am – 4.00pm & Wednesdays 9:30 am – 12.00pm at the BBG Samuel Gadd Centre.

April 10th to June 7th 2021	"Naturally Inspired" Art Exhibition. FBBG Illustrators and others	St Arnaud Railway Station, St Arnaud. Friday- Monday 11am - 4 pm
Sunday May 30th 2021	Botanic Gardens Day - A celebration of Botanic Gardens	Bendigo Botanic Gardens 10am - 2pm. Guided Walks, Botanical Illustration and plant sales
April 29th to May 1st 2022	2022 AAFBG Members' Biennial Conference	Eurobodalla Regional Botanic Gardens, Batemans Bay NSW. info@friendsbotanicgardens.org
Postponed from 2021 now October 24-28th 2022	17th Australasian Botanic Guides Conference	Royal Botanic Gardens Victoria. https://www.rbg.vic.gov.au/volsconf21

Departure of Aaron Lindsay (Coordinator Public Space Design, COGB)

"Over my ten years at Council I've really appreciated the support and enthusiasm of the Friends in the implementation of the Bendigo Botanic Gardens Master Plan." Aaron Lindsay

Aaron will be finishing up with the City of Greater Bendigo on the 30th of April to take on a new role of Manager Projects and Asset Management at the City of Bunbury in Western Australia.

We will miss Aaron and sincerely thank him for his support for the gardens and his tireless work in progressing the Master Plan. We wish him well in his new position in Western Australia.



Lining up for gate opening - Plant Sale April 10th 2021

Dovyalis is published by the Friends of Bendigo Botanic Gardens, Inc. 71 Napoleon Cres. Bendigo 3550
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