

# 'Geo-Log'

## 2004



Journal of the Amateur Geological Society of the Hunter Valley

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## **President's Introduction.**

Hello Members and Friends,

**I have the honour of writing the President's Introduction for our inaugural annual magazine, Geo-Log 2004.**

Many thanks goes to Ron for the work he has put into this magazine. Thanks also to the people who have contributed reports and photographs, and everyone who has helped in the editing and compilation.

2004 was an excellent year for the society with an interesting range of activities, from Egyptian Hieroglyphs to our Annual Safari to the gold fields and volcanic areas of Victoria.

The photographic competition was a great success with some excellent photographs entered. From some of the comments I have overheard, I think there will be some stiff competition in 2005, so make sure you carry your cameras at all times on activities. Who knows, you may take the winning shot.

A special thanks to everyone who has organised or assisted in an activity, or opened your home to us. Without you, the club could not exist.

**We will try to make 2005 even better, [if that's possible] so feel free to offer suggestions for any activity you think would be interesting, whether social or geological.**

Regards,

Jan.

# COON ISLAND SWANSEA RAMBLE

Saturday 17<sup>th</sup> January 2004

Leaders: Bob Bagnall & John Le Messurier.

The day turned out to be bright & sunny. We all assembled [31 of us] in the car park at the end of Channel street Swansea.

Our objective was to explore the largest **sand island in Lake Macquarie, "Coon Island."** It covers an area of approximately 15 ha, is joined to the township of Swansea by a causeway, and is at the Northern end of Swansea Channel. Salt resistant vegetation & low native shrubs completely cover the island. It is an area that is steeped in rich and colourful history.

Coon Island was occupied in the early days of the colony [approximately 1814] by Chinese families who had originally made their way to Australia to work in the gold fields.

The Chinese made a living by netting fish on the sand flats, drying them in the sun, then sending baskets of dried fish to the Sydney markets.

The Island is strategically placed to be used by vessels leaving Lake Macquarie. Boats could travel down the channel and cover the 50 nautical miles to Sydney quite easily.



Assembly time before our Coon Island Walk.

Overnight accommodation was made available [by the Chinese] for the merchants to use before taking the early morning tide south.

**"Shingle Splitters" point, near Balcolyn** on the Western side of the lake, was home to six families of woodsmen who would load their boats with hardwood shingles for the busy Sydney housing market.

On the way South, the families would stay overnight on Coon Island before taking the long trip down the coast to Sydney.

The Chinese were well known in the area and provided the only regular ferry boat service across the channel. This extended to the construction of two large pontoons to bring cattle and carts across the dangerous waterway and the opening up of the whole Southern side of the channel. Access roads from Catherine Hill Bay and the South were not available until 1909.

Coon Island has another claim to fame in early Australian History, and that is the production of the FIRST locally made wide



Start of the Coon Island Ramble.



Site of Coon Island Jetty.

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brimmed hats. The Chinese women had brought with them the skills of plaiting the flat sand reeds [found on the edge of the lake] into wide brimmed hats.

The early Europeans to the colony had not mastered this art and Coon Island became the centre of hat making with the Chinese eventually scouring the whole lake's edge looking for the precious flat weed.

With the coming of the new road from the South and the Department of Main Roads providing a channel crossing in the form of a large punt, the Chinese left the island and by 1912 it was abandoned.

After the 1914/18 war, many returning diggers were in a terrible mental and physical state. Shell shocked and battle weary, they tried to return to normal society but found it too difficult.

No group therapy or trauma counselling was ever offered to them, and so the names of the local able bodied went into a lottery. The prize was a parcel of land on Coon Island, which was a nominal size of 10 yards of waterfront by 20 yards deep.

Along with the prize came 1,000 pounds to construct your own therapy accommodation. No running water, electricity or sewage would be connected.

It was for the diggers to use for the rest of their natural lives, and in 1921 a clause was added to the original agreement that the



Remains of cottage frontages - they were built very close together.

shacks could be used by the wives of the ex-soldiers [after the diggers died] until they **themselves passed on. Upon the spouse's death**, the land and premises would revert back to the crown.

**At its peak in the 1930's there were over 100 dwellings on the island.** These were all **vacant by the 1980's and by 1995 all the houses had been removed from the island.**

Coon Island is now controlled [on behalf of the Federal Government] by Lake Macquarie Shire Council, as a dedicated Reserve.

During the walk, we were able to pinpoint foundations, seawall steps, boat ramps, old wall tiles and other household items littered about the sites. They were real finds!

After a restful lunch break under the magnificent flowering Coral trees on the edge of the channel, we were taken around the beautiful Lakeside Drive of Swansea Flats overlooking Wangi Wangi Point to study the local bird life and spend an hour over a delightful afternoon tea in Galgabba Reserve.

What else could anyone ask for on a flawless day in January?

*Report by Bob Bagnall.*

## KARIONG HIEROGLYPHS

### Saturday 6<sup>th</sup> March 2004

Leader: John Cater.

On a day that became duller and wetter the further South we drove from Newcastle, 14 or so hardy souls met at Kariong Recreation Reserve for morning tea. After some trial and error finding our meeting place, we parked and readied ourselves for a kilometre walk into the bush to find the Kariong Hieroglyphs. These were thought to be carved over a number of years by a hermit following



Preparing for our walk into the bush.



Examining flowers ~ about half way to the Hieroglyphs.



Entering the cleft in which the hieroglyphs are carved.



Examples of the carved Hieroglyphs.



Large aboriginal carving found on the path during the return walk.

World War 1. As we proceeded into the bush, it really started to rain. However, it was very beautiful in the rain & several aboriginal carvings, after being filled with water, were easily seen. Eventually we found the site of the carvings, a natural cleft in the sandstone. Being wet, it was a little slippery and care had to be taken.

Once in the cleft, we were amazed by the number and variety of carvings. Because the site is well sheltered, the carvings were in very good condition.

The return journey back to the cars for lunch was wet, wet. Rain or not, it was a very interesting outing.

*Report by Ron Evans.*

## MUNGHORN GAP

27<sup>th</sup> & 28<sup>th</sup> March 2004

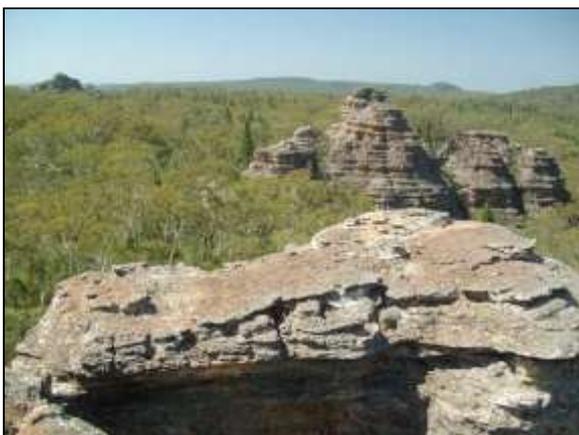
Leader: Barry Collier.

This was intended to be a combined outing with our club and the Newcastle Ramblers bushwalking club. Only a relatively few members turned up and of those, only Jenny and Michael Green were not also members of the Ramblers.

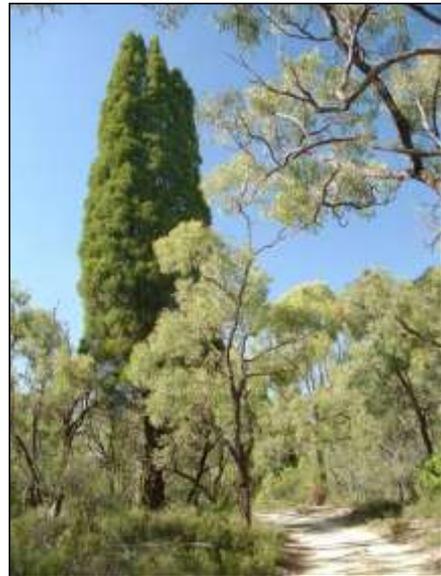
Munghorn Gap Nature Reserve is a medium sized Nature Reserve, dissected by the road from Mudgee to Bylong. In its centre is a plateau of Narrabeen Series sandstone and conglomerate, which is fringed by spectacular beehive formations. It is situated on the Great Dividing Range and is immediately adjacent to the south western edge of the Goulburn River National Park.

We all turned up at various times on Friday night, with varying delays, interesting detours and a number of stories, due to a large truck getting stuck on the bridge at Denman, which caused the bridge to be closed for around 24 hours.

Two of the rambles had astronomical telescopes, so we took advantage of the clear skies and the knowledge of Carl Schwark, a very keen and knowledgeable amateur astronomer, to look at a number of planets and interesting constellations.



Pagoda formations at Castle Rocks.



Walking track to Castle Rocks.

Early Saturday morning was spent surveying the camp site surrounds and discussing programs.

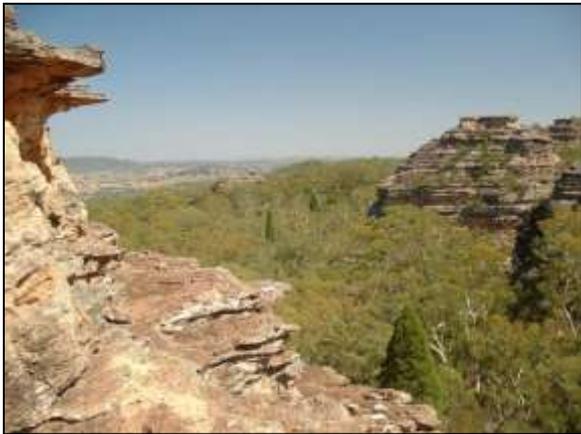
I decided to lead a walk to Castle Rocks, about 4 km each way, through beautiful bushland, dominated by old Scribbly Gums and towards the start, giant Cypress Pines. An added attraction was the incredible number of giant Golden Orb Weaver Spiders.

Castle Rocks is a spectacular group of beehive formations, with expansive views to the south.

Lunch was enjoyed on top of the main rock, followed by exploration of the fantastic group of rocks. After the expenditure of energy in exploring the rocks, the 4 km return, with no views along the way, felt more like 40, but we all returned in high spirits, feeling it had been a great day.

A few of us decided that the day hadn't ended yet, so I led a walk up onto the plateau above the camp for some beautiful views and spectacular rock formations, while Jan led a walk to a dry waterfall at the base of the escarpment.

After dinner, there was more stargazing before we settled down to a very pleasant night with the promise of rain in the morning.



Pagoda Rocks.



Bob & Jill Bagnall at the TAFE Dinner.

Next morning was bright and clear, so Elaine and I went off to a nearby picnic area for some early morning photography, but the clouds soon rolled in, thankfully without any rain.

After breakfast, I decided to lead a walk to the former Munghorn Trig Station, a similar walk to the day before, but only 2 km each way. At the site of the trig station, there was no evidence left of any structure, but nearby was a cliff overlooking a labyrinth of beehives and canyons. A great place to return to and explore one day. We then returned to camp for lunch, packing up and a return to civilisation.

*Report & Photographs by Barry Collier.*

## SOCIAL EVENINGS 2004

Organisers: Social Committee.

TAFE DINNER - Monday 17<sup>th</sup> May.

For the past few years, Society members have enjoyed a social evening and wonderful meal at Hamilton TAFE's restaurant. Food and service are provided by hospitality students.

The meal consists of 3 courses with two different dishes per course. The meals have always been superbly cooked and presented

by the students.

SOUP & SLIDES - Saturday 5<sup>th</sup> June.

Soup & Slides have been a tradition for many years. A number of garages have been used over the years to hold a social evening that consists of a meal of soups cooked by various members followed by a slide show and supper.

The soup is heated outside over fire buckets [nice to keep warm around on cold evenings] and everyone samples the different soups [usually 3] until full.

The slide shows over the years have been superb, especially Brian England's slides of his overseas trips to places such as Russia, Mexico, Glacier NP in Patagonia and the Kamchatka Peninsula.



Bob Grey, soup minder.

## GLENROCK LAGOON

24<sup>th</sup> April 2004

Leaders: Bob Bagnall & John Le Messurier.

It was early March when I decided to contact an old friend, John Le Messurier. John and I had spent some great weekends at Glenrock Scout Camp over the last 30 years.

Our outing started on the morning before Anzac day when 31 members and **friends met at "Yeulerbah" track car park at Whitebridge.**

Glenrock State Recreation Area covers 516 hectares and is the home to the Scout Association [Hunter & Coastal] Training Camp. The walking track passes through a variety of landforms, from rainforest with tracks that weave through thick undergrowth passing lichen covered stones and boulders, vines, ferns and bush orchids to the impressive new bridge crossing at Flaggy Creek. After passing two impressive waterfalls we reached a lookout where Glenrock Lagoon and its sand spit could be viewed.

The early history of the Glenrock valley was explained by John at the beach where we stopped for lunch. He enlightened us by



Walkway beside Flaggy Creek.

pointing out the Aboriginal 'Bora Grounds', and the site where Mary and William Bryant discovered coal on 30<sup>th</sup> march, 1791, a full 6 months before Lt. Shortland discovered coal at the mouth of the Hunter River. As a direct **result of the Bryant family's find, the original Burwood Colliery was opened on the southern side of the lagoon in the 1850's. It was part of the A. A.'s holding of the Mitchell Estate, and covered a surface area [including sea wood] of 1359.78 ha. It was known as the original Burwood Colliery Site.**

It should be noted that the coal wagons that travelled from Burwood to the Glebe at Newcastle, were horse drawn. The coal was the tipped onto the side of the railway tracks. Convict labour was used to load the coal into **smaller carts which ferried the 'black gold' to the Newcastle Wharves** where it was shovelled into steel rimmed wheelbarrows and loaded, via planks, onto the waiting sailing vessels. Each convict miner was expected to remove 1.5 tonnes of coal from the mines each day, while each convict ship loader was expected to load 15 tonnes of coal a day, no matter what weather conditions prevailed.

It is interesting to note that the first steam locomotive built in Newcastle carried **the name "Burwood."** It was constructed in the Glebe [Merewether] workshops of J. S. Rogers and was built for E. C. Merewether at a cost of 1,350 pounds or \$2,700 in today's currency. The locomotive was completed in June 1878 and immediately went into service.

The original Burwood mine [located on



AGSHV members meeting in Yeulerbah car park.

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the Southern side of Glenrock Lagoon] had followed the underground coal seams in all directions, and in 1881 it was decided that **the 'Pit Head' should be moved from the original site at Glenrock [where there were problems with salt air and flooding] to a new site several kilometres South of Whitebridge. So in 1884 the relocation took place and it was then that the mine changed hands and was purchased by the "Scottish Australian Company."**

Meanwhile on the Northern side of the lagoon coal had been found lying on the ground also. It was the top of the Glenrock Seam. A new mine was formed by the Scottish Australian Company [which called itself **'Glenrock Colliery'**] and a new venture North of the lagoon was started.

The Glenrock Colliery went into production with mining going out under the ocean for almost 5 km. Coke ovens were established, along with a large smelter site. Problems with water into the tunnels forced the Glenrock Colliery to move to a more suitable site in the adjacent **"Murdering Gulley"**.

Our outing then took us into the Scout Associations land located on the site of the first Burwood mine on the Southern side of the lagoon.



Rocky bottom of Flaggy Creek above the first waterfall.



Glenrock Lagoon & sand-spit ` Scout Camp on right.

In the early days of the colony, this land was given [by means of a grant] to Dr. James Mitchell who was a surgeon with the British Army. He was attached to the 48<sup>th</sup> Regiment and had seen active duty with Lord Wellington on many fronts, including those against Napoleon at the Battle of Waterloo where he had been a front line surgeon.

The army ordered Mitchell to Sydney where he became the Colonial medical Department's head surgeon at the newly constructed Royal Sydney Hospital.

He commenced his industrial ventures by opening a **'Salt Works' at Stockton in 1838**, but it failed a short time later.

In 1839 he opened a clothing factory [again at Stockton] which was known in those days as **"Pirate's Point"**. The factory produced Scottish Tweed from the Macarthur fleece brought from Parramatta.

In 1845 the factory was producing 70,000 yards of cloth a year and employed over 100 men. On June 11<sup>th</sup> 1851, the factory was destroyed by fire. It was said to be sabotage!

Dr. Mitchell was broken by the event. He borrowed money from the A. A. Company to rebuild his empire, but died soon after in the 1860's.

The original name **'Burwood'** as used for the colliery, came from Dr. Mitchell's ancestral home in Surry, England, a sprawling estate called **"Burwood Downs."**

After Dr. Mitchell's death his daughter



John Le Messurier explaining some history of Glenrock Lagoon to AGSHV members.



Brian England absorbing the beauty of Glenrock Lagoon.

married Edward Merewether. Merewether **took over Mitchell's estates and later became** General Superintendent of the A. A. Company.

Edward Merewether now controlled the **land grants at 'The Glebe' [now Merewether]** and Glenrock, which was all part of the original **Dr. James Mitchell's "Burwood Estate."**

Anyway, from **Dr. Mitchell's family** it was handed to the Merewethers who later sold it to the Scottish Australian Company, and on September 21<sup>st</sup> 1932, the land occupying the original Burwood Colliery was purchased by BHP in Newcastle. In October of the same year BHP provided a 99 year lease covering 100 acres [40.5 hectares] of the land to be used for Scouting purposes. The cost to the Scouting Association for the termination of the agreement was 6 pence [5 cents].

Sir Robert Baden Powell and his wife Lady Olave Baden Powell visited Newcastle in 1932 to thank BHP for their magnificent donation to the worldwide brotherhood of scouting.

When the Scouts first occupied the land, only two buildings [from the original mine] were left standing. One dwelling was that of Sandy Patric who lived at Glenrock and was caretaker of the Merewether Estate at that time. Sandy ran cattle on the flatlands of the lagoon to supplement his income. His house was destroyed by an unknown arsonist in 1953.

The only original mine building still standing at the camp these days is the **'Overmans' or 'Undermanagers' cottage**. Built before 1887 [photo taken in 1887 shows building on site] it was recently found to be white ant infested and extensive renovations have taken place. The National Trust oversaw the upgrade and a heritage order has now been placed on the building.

**The first "Wood Badge" course run at** Glenrock for Adult training for Scout Leaders was held over the New Year weekend 29<sup>th</sup> December, 1932, to 2<sup>nd</sup> January 1933. During that weekend, the Scout Leaders dug the first well to provide fresh drinking water. That well is still in use today. Over the years, tens of thousands of youth members have attended Scout Camps at Glenrock.

Leading up to the 2000 Olympic Games, it was used by Central African teams to house and train their track and field athletes. It is a beautiful area with a serene presence. I feel sure that Dr. James Mitchell would be very proud to see part of his old Burwood Estate come alive again, not to the throb of industry, but to the sounds of people enjoying themselves as they absorb the beauty of the surrounds that is Glenrock recreation Area.

*Report by Bob Bagnall.*

## FOSSILS - TREVALLYN

Saturday 22<sup>nd</sup> May 2004

Leaders: Ross Staines, Glenda Smith & Ron Evans.

The outing to our quarry this year on 22<sup>nd</sup> May was a follow-up to a preliminary foray in November 2003. The weather was much kinder than it was for the earlier trip, (which was notable for the scorching temperature), and we had an excellent turn-out. The quarry had been recently worked for local road-building which broadened the base and exposed new strata, providing less weathered rock areas. It consists of Carboniferous shale and mudstone on the western face of the north-south ridge that parallels the Gresford – Vacy road. The sedimentary strata dip from east to west at a moderate angle and the penetration of the quarry into the ridge has exposed a good range of strata including a vertical face on the northern side of the quarry where deformation of the strata is visible. Fossil evidence supports the theory that sedimentation occurred in a warm marine environment of mostly clear water.

Exploration ranged from enthusiastic hammering to quiet poking around, but a good variety of fossils was unearthed and **souvenired**. To repeat the gist of Ron's summary in the newsletter, the fossils discovered



Fossil hunting in the lower quarry.



Leonie Mills & Tony Turnbull searching for fossils in the lower quarry.

included different types of brachiopods such as spirifers, productids, orthids and leptogonia; corals; mat and fan-shaped bryozoans; gastropods; plant fossils and crinoids. They were generally in the form of internal and external moulds, with some original shell material still preserved. The find of the morning was a trilobite tail by Jenny Rose, who was very excited by her discovery. Ron gave the activity an extra dimension by gathering some of the samples found and explaining their origins and classifications.

After a picnic lunch on our back lawn, the group wandered up the hill and into our **neighbour's property to explore the higher** strata that form the top of the ridge. The fossils here were better preserved than the ones in the quarry because of a difference in the rock formation. Apparently, it is a fine sandstone with a greater calcium carbonate content which is more resistant to weathering, and yields fossils which are more clearly defined.

We enjoyed the day as much as the rest of the group seemed to. The quarry has been a source of interest to us over the years, and has been a very easy way of entertaining visiting children, but we felt we gained a great deal in getting a new perspective on it. We also appreciated having a club outing so close to home!

*Report by Glenda Smith and Ross Staines.*

## DEVIL'S ROCK

21<sup>st</sup> August 2004

Leaders: Ron Evans & Stan Madden.

Thirty two members met in the car park at the intersection of George Downs Drive and Mogo road, and after morning tea, travelled by 4 wheel drive vehicle to Devil's Rock, which is reached by travelling West along the Mt. Simpson track until it reaches the Boree track, and then South along the Boree track.

Devil's Rock, a relatively bare sandstone outcrop some 320 m above sea level, is a location rich in aboriginal artwork. Many carvings as well as axe and spear grinding grooves are to be found over its surface. In nearby caves various forms of painting are to

be found. From the summit, expansive views over the Great Dividing range are obtained. Devil's Rock obviously was a very important site to the Aboriginal people who inhabited the area.

The weather on the day was wonderful - clear air with the bush clean and bright. We spent about an hour on the summit discovering and examining aboriginal carvings; animals, tools, feet, spirit figures, as well as spear and axe grinding grooves.

Small patches of flowering native plants [some endangered] grew in depressions that trapped soil and water.

The group then walked to the Eastern edge of Devil's Rock where small caves containing aboriginal paintings were discovered, examined and photographed.



The top of Devil's Rock looking West towards Mt. Yengo [left] & Little Yengo. [Mt. Wareng]



One of the small caves containing aboriginal paintings. The caves form under sandstone overhangs which protect the paintings.



Spear & axe grinding grooves surrounding a small pot-hole which stores water after rain.



Red ochre & charcoal drawings found in one of the caves.



Lunch, Pancake Rocks.

On returning to the cars, we drove **South of Devil's Rock for some 5 km to Pancake Rocks** for lunch. The site contains large areas of bare sandstone amongst the bush on the Eastern side of a deep valley. Many aboriginal carvings are present.

After lunch, time was spent exploring the area and examining carvings before we left for the return trip home.

A big thanks goes to those members who transported others in their 4 wheel drives for the day.

*Report by Ron Evans.*

**MURRUNG WALK, FINGAL HEAD**  
2<sup>nd</sup> October 2004

Leaders: Ron & Ellen Evans.

Saturday was wet and windy. However, the forecast predicted that the weather would clear around lunch time giving a fine and sunny afternoon. With this in mind, and also the fact that only one activity has been cancelled in the 25 years of the AGSHV, six members met at Fingal Bay in front of the Surf Club.

After meeting and discussing the weather, we decided to stay with tradition,



Map reproduced from "Bushwalks around Port Stevens" by Michael Smith.

wait and see what happened to the rain. As we were finishing lunch in our cars at about 1.00 pm, the weather suddenly cleared from the South with the rain stopping and the cloud cover thinning. So, we headed off on the walk.

The first part of the walk is the ridge-top track that winds its way through coastal heath and low forest. The track was remarkably dry and surrounded on both sides by spectacular wildflowers. Because of the clean air, the views from the high parts of the track were very clear in all directions.

The weather continued to clear and the sun came out.



Looking South through the coastal heath from position 'H' on the above map.

On reaching the track near the Sewage Treatment Works, the track turns SE and brings you onto the rocky coast. The rocks are lavas of Carboniferous age and are very easy to walk on. Spectacular coastal scenery and landforms are seen as one walks North.



Example of beautiful wattle flowers seen besides the track.



View South from the walking track near the Sewage Treatment Works.



Some of the beautiful coastal scenery along the shore - Point Stevens in the distance.

The rocky shore is followed North until a rescue buoy and memorial to Russell Ionn is reached. From there, a steep, but not very long track takes you up the hill to the ridge-top track and ultimately back to the start of the walk.

Before leaving for home, time was spent exploring other tracks around Fingal Head which gave views North and passed a deep gutter formed from an eroded dyke.



Ellen Evans at the rescue buoy and Russell Ionn Memorial.

*Report by Ron Evans.*

## REDHEAD ROCK PLATFORM 20<sup>th</sup> November 2004

Leaders: Ron Evans & Brian England.

The Saturday of the outing was a cool windy day with occasional showers. As leaders, Brian and I turned up and waited to see if anyone else was willing to participate. Within 15 minutes, 5 other hardy souls arrived. It was very windy on the bluff, but sheltered along the walking track through the vegetation on the Awabakal nature Reserve. As it had stopped raining, we decided to go for a 5 minute walk and check out the track down to the rock platform.

The track down to the rock platform was damp only and very stable [no loose



Pot-hole weathered sandstone in the upper littoral zone.



Yellow staining of sandstone due to iron minerals soaking into the porous sandstone.

gravel], so we descended to the rock platform, which, to our surprise, was relatively sheltered from the wind.

Being low tide, most of the platform was dry and so we were able to spend the next 3 hours discovering, discussing, admiring and photographing many splendid geological features.

Geological features found included a dolerite dyke that terminated at one end before commencing nearby in another joint, honeycomb weathering in sandstone, pot-hole weathering, ironstone lenses, tessellated pavement, cross-bedding, petrified wood, mega-ripples and large vertical joints surfaced with sheets of insoluble iron oxide.

Amongst the most spectacular landforms were wonderful examples of tessellated pavement. This forms when minerals percolate into sandstone blocks along joint planes causing the indurated rock to become

more or less resistant to weathering and erosion. In time, pillow shaped outcrops develop forming the tessellated pavement.

The Southern end of the rock platform differs from the Northern end in that a thick sequence of cross-bedded conglomerate [Redhead conglomerate] caps the cliff. Large vertical joints indurated with insoluble iron oxide coat the joint planes leaving smooth vertical faces exposed when large blocks of conglomerate fall from the cliff.

Many of these large blocks of fallen conglomerate found along the cliff face weather into fantastic shapes.

Redhead rock platform is a fascinating place to the geologist, photographer and anyone interested in spectacular coastal scenery.



Petrified log — the original wood has been replaced by insoluble iron oxide, hence the wood is very heavy. Note how the log has been flattened due to compaction.



Tessellated pavement. Note the development of the pavements over time from the oceans edge on right [least erosion] where joints are starting to erode, to then well developed pavement [most erosion].



Large vertical joints running through conglomerate on the Southern end of the rock platform. The shale/fine sandstone strata underneath contains much petrified wood.



Anvil-shaped block of weathered Conglomerate at base of cliff.

*Report by Ron Evans.*

## BLUE MOUNTAINS WEEKEND

30<sup>th</sup> to 31<sup>st</sup> October 2004

Leader: Barry Collier.

Two years ago a trip to the Blue Mountains was arranged, specifically to enjoy the remarkable wildflowers, rock formations and scenery of the Greaves Creek / Mount Hay section of the Blue Mountains National Park. On that occasion all of the Grose Valley catchment downstream from Anvil Rock was closed because of bushfire damage. So, here we were again.

Everyone turned up on Friday night, but unfortunately, half the people were unexpected, so we had to stick to the program and start at 10 am on Saturday, in case other unexpected arrivals were on their way. As it turned out they weren't, so we missed out on at least an hour of activity.

I went out at sunrise and found that the regeneration from the fires was far less than one would have expected, presumably because of the drought. As a result of that lack of regeneration, I decided that instead of a day on Fortress ridge and a long half day at Butterbox Point, we would spend a day on Butterbox Point and points of interest along Mount Hay Road, followed by half a day somewhere else.

While waiting for possible late arrivals, some went to the Rhododendron Gardens, while I took a group to Hargraves Lookout, where we came across some spectacular Waratah displays.



At 10 o'clock sharp, we headed off towards Mount Hay and as soon as we left civilisation, there were Waratah displays everywhere, so I read the



Butterbox Point.



Differential weathering of indurated cross-bedded sandstone creating spectacular rock formations.

riot act and said we were going to Butterbox Point and the Waratahs would still be there on the way back.

At the end of Mount Hay Road, there is a **'Y' shaped ridge, with the right hand arm** leading out, about 1 km, to Mount Hay and the left hand ridge leading about 500 metres to the edge of the sheer cliffs of the Grose Valley. Butterbox Point is a box-like plateau, about 30 metres high and 100 metres across, perched on the end of the left hand ridge.

To the left of Butterbox Point, there is a ridge leading down to where Rocky Point Creek emerges from the Butterbox Canyon, at the commencement of the spectacular Walford Wall, which extends approximately 3 km to Lockey's Pylon, a similar feature to Butterbox Point. Along this ridge are what I believe to be the most spectacular rock formations in the Blue Mountains. Brian Eng-



Rock formations near Butterbox Point.

land took one look and informed us he would be here, taking photos, for the rest of the day.

After lunch amongst the rock formations, followed by lots of photo taking, people began to move off, intending to stop at various features along Mount Hay Road. Brian, Elaine and I climbed into a side creek, to a magnificent double cave, with probably the best single stand of Waratahs on this trip, just in front of one of the caves.

From there it was back to the cars, afternoon tea, and a drive to the track leading to Flat Rock Trig. Under normal circumstances, the rock formations around the small plateau containing the trig station would have fascinated us no end, but coming straight after Butterbox Point, they were a little ho hum. We then adjourned to camp, cleaned up and headed off to a great pub meal at Blackheath. A great way to end off a great day.

On Sunday morning we all packed up, exited the caravan park, and headed off to Katoomba Falls and the Scenic Railway. A small number of unfit people had a wander around the Scenic Railway and Scenicender terminal, before boarding the Scenic Railway to wait for the rest of us at the bottom.

The rest of us had a great walk down, just west of the falls, with some detours to various viewpoints of the falls. Once on Federal Pass we were swamped with foreigners,



Katoomba Falls.

mostly Japanese and German, and at the base of the Scenic Railway, managed to find a small group of Australians.

We then explored the amazing series of boardwalks through the rainforest, before eventually arriving at the base of the Scenicender. We must have just missed one, because we had the place to ourselves, but it wasn't long before there was standing room only and surprisingly, we all managed to get on the next carriage. Definitely standing room only.

At the top it was a case of running the gauntlet of all the merchandising, and re-grouping at the cars where those heading home headed for home and those staying headed off to find lunch.

*Report & Photographs by Barry Collier.*



The Man from Snowy River?

## WETLANDS RAMBLE

13<sup>th</sup> November 2004

Leaders: Betty Nyman & Ethel Raine.

On Saturday, 13th November, 14 members met at The Wetland Centre, Sandgate Road, Shortland, for an exploratory ramble. Ethel Raine and I, both volunteer guides at the Centre, led the group. The day was overcast and rain seemed likely, but as often happens, it cleared and became very warm.

The Wetland Centre is a 48 hectare area of freshwater and salty ponds, on the eastern edge of Hexham Swamp, draining into Ironbark reek. It has a fascinating history. What is now a well vegetated, beautiful habitat for birds and wildlife was, just over 20 years ago, a neglected rubbish strewn site. The well presented and attractive Visitors' Centre was at that stage the derelict Hamilton Rugby Club building fronting disused football fields. The site was used as an unofficial dump, and Newcastle City Council official rubbish dump was close by. A piggery and a dairy occupied the site in even earlier times, while the earliest European owner to come to light seems to be the Newcastle - Wallsend Coal Company, which advertised the land for sale in 1920.

In just over 20 years a miracle of restoration has been accomplished. Ponds now replace the football fields, and a total of 8 ponds provide home and refuge for many species of waterfowl, birds, including migratory birds, turtles and frogs. Over 40,000 plants, shrubs and trees have been planted, to replace those cut down in earlier times, to invite and provide for hundreds of bush birds and bats. Magpie geese have been restored, and the rare and endangered freckled duck has been bred. Facilities for visitor information and recreation have been estab-

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lished. The ultimate success was achieved when TWC was included, with the Koora-gang Wetlands, on the Ramsar list as a wetland of international significance.

Our ramble started traditionally, with morning tea - in a shelter overlooking the main pond. Here the group heard some of the history of the Wetlands, and viewed the resident population of dusky moor hens, Eurasian coots, little grebes, Pacific black ducks and magpie geese, and cormorants.

Frequently visitors such as pelicans, whistling ducks, pink-eared ducks and others fly in, but not this day.

We proceeded by a rambling, wandering about, looking closely at the BHP and Brambles ponds (named for the those who created them) the water Ribbon Pond ( a misnomer as the water ribbon is totally demolished by the swans and the magpie geese!) and the Farm Dam, making for the Egret Observation Tower which overlooks the Melaleuca Swamp where the egrets were nesting. Walking around the swamp we could view the busy egrets fluttering and fussing in the trees as they prepared their nests, their beautiful breeding plumage in evidence.

After backtracking to the other side of the Melaleuca Swamp with more egrets to view, we set off for the 1 mile walk to the banks of Ironbark Creek with its mangroves. Along the way we were aware of the proximity of houses, and of the effect on natural bushland when garden rubbish is discarded "over the back fence". Also in evidence were the stormwater drains which empty into the wetlands, reminding us of the basic function of wetlands to slow, sift and store run-off, and of our responsibility to watch what we put into the gutters.

Lunch, rest and recuperation were taken in the rainforest shelter known as the "Outdoor Classroom", followed by a walk

through the partially restored rainforest. We returned with a detour along the way to view the Freckled Duck enclosure where a successful breeding program had been undertaken. The mature ducks remaining were now just enjoying life with no great expectations of them!

By the time we arrived back at the Visitors' Centre we were hot and tired and ready for refreshments, which were readily available from the excellent cafe. It had been a good day- and Ethel and I were pleased to have had the opportunity to guide a walk that took longer than one hour!

*Report by Betty Nyman.*

## HILL END WEEKEND

16<sup>th</sup> to 19<sup>th</sup> September 2004

Leaders: Barry Collier & Brian England.

Many participants arrived at Hill End Wednesday afternoon and set up camp in the Village Camping area. This contained 5 powered sites for those with caravans, toilets and coin operated hot showers. The remainder of the group arrived on Thursday afternoon, **some camping and some in B & B's.**

**The early group 'did their own thing'** on Thursday morning. Ron, Jan and Ellen did a drive down the Bridle Track to the Turon river. This was followed until it joined the Macquarie River. We continued towards Or-



Early cottage near Turondale.



Extensive erosion along the Bald Hill Walking Track.



Brian England examining Oakey Creek, the remains of Chappells Dam wall behind.

ange before returning to Hill End via Turondale and Sofala. [Nice morning tea]

On Friday morning, the complete group [20 members] under the leadership of Brian, explored the Bald Hill Walking Track.

This allowed one to observe how extensive the impact of mining was on both the social and physical environment of the town. This was particularly so at the site of Chappells Dam and 24 head stamp battery site. Extensive erosion due to alluvial mining was very evident on the return walk.

After lunch, we drove up to the Beaufoy Merlin Lookout where a panoramic view of Hawkins Hill can be seen. In 1855, gold bearing quartz was worked on the surfaces of Hawkins Hill by the Rowley brothers. The existence of a reef extending to some depth was discovered by Daddy Nichols [Cornish

miner] and first worked in 1860. Between 1870 and 1872 Hawkins Hill yielded very rich deposits at depths of 40 - 50 metres.

The Beyers and Holtermann nugget, the largest single piece of reef gold ever discovered, was found in the Star of Hope mine on 19<sup>th</sup> October 1872. It weighed 286 kg.

Production declined during 1873 and no new ore bodies of comparable size or richness have been found since. During the boom years of 1871 - 1874, 12.4 tonnes of gold was won from Hawkins Hill.

Before returning home, we drove to Bald Hill lookout which gave us a panoramic view over Hill End. We all met in the **camping ground for social 'drinkies' before dinner.**



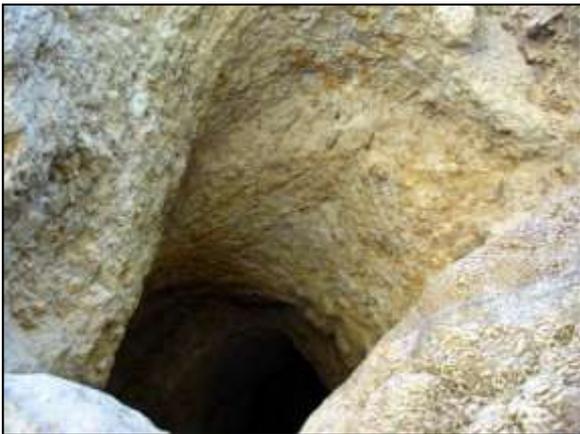
Hawkins Hill as viewed from Beaufoy Merlin Lookout.



Golden Gully - note the extensive erosion.



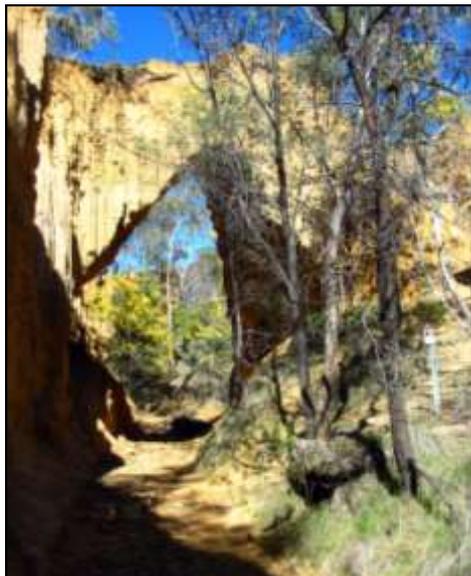
Sue Rogers exploring Tambaroora cemetery.



Old mining tunnel - note the original pick marks on the tunnel roof.



Brian England's nugget attracting much interest from Ellen Evans, Ian Rogers & Jim Grey.



Natural arch in Golden Gully. A number of tunnels occur in the walls on the left of the arch.

Saturday morning and we all headed to Golden Gully where alluvial gold was discovered in 1851. The area has been extensively mined and today is highly eroded. However, evidence of mining is present in the form of tunnels showing pick marks on the walls.

Then it was off to the site of the former Tambaroora township to try our luck fossicking. It was a town that existed some 5 km north of Hill End and flourished in the 1850's due to the nearby alluvial gold deposits. At its peak, it was home to some 2500 people. On the way, we stopped at its cemetery for a look and morning tea.

At Tambaroora creek, a number of enthusiastic fossickers attacked the creek with shovels, sieves and gold pans. No luck until Brian, explaining that when sieving, you always turn the last sieve full of gravel over [in



Quartz Roasting Pits - ore was placed in cone-shaped holes on top & fires lit in the openings below supplied heat to soften the quartz rich ore.



Jovial diner's Royal Hotel, Hill End. L to R, Stan & Dawn Madden, John Cater, Bob Grey, Janet Cater, Chris Grey.

case there is a large nugget in it] did so and just sat back and stared - sitting on top of his gravel pile was a large nugget.

The nugget turned out to be a gold pendant that some unfortunate lady had lost when panning. A blob of glue [where a cord was attached to the nugget] was still attached to it. From the nugget's shape, Brian stated that it was not natural, but made for jewellery.

After such excitement, we headed to the Quartz Roasting Pits for lunch and a look around. In 1855 the Colonial Gold Mining Company built the roasting pits to prepare ore for crushing on a field north of Hill End known as the Dirtholes. Today, their remains plus those of the stamper battery housing and related buildings remain. The Dirthole field never went into production.

Lunch and exploring the remains over, it was back to town for a Devonshire Tea at

Rose Cottage. On the way back, we stopped briefly at Valentines Mine where a shaft and remains of a stamper battery are to be seen.

Rose Cottage is a renovated early cottage looked after by an elderly lady who prepares and serves wonderful Devonshire Teas in her marvellous garden. She had been warned that a 'horde' would arrive at 4.00 pm and so had made extra scones. With lots of eager helpers, we were soon sitting up to a scrumptious feed of home made scones and tea or coffee.

That evening [Saturday] we all went up to The Royal Hotel for dinner. The Royal Hotel is the sole remaining hotel from the 52 that used to be in Hill End. We ate in the Dining Room. It was a long room furnished with antique furniture and had a wonderful atmosphere, helped no doubt by the jovial mood we were all in. A wonderful meal completed, it was off to bed as most of us had to



Devonshire tea, Rose Cottage.



Village Camping area Sunday morning before departure.

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return home Sunday morning.

The stay in Hill End was wonderful. The grass was green, the weather perfect [cool nights and clear sunny days] and the flowering wattle and fruit trees perfect.

*Report by Ron Evans.*

THE BRIAN M ENGLAND  
MINERAL COLLECTION  
Saturday 10<sup>th</sup> July 2004

This is a private collection of world renown assembled by Brian England over a period of 50 years and displayed in a small purpose-built museum. As well as the display quality minerals, (around 1400) there are several other parts to the collection including micromounts (5000), economic minerals and ores (450), fluorescent minerals (200), rocks (550) and fossils (300). All are maintained and catalogued as separate collections. However it is the minerals which attract the greatest attention from visitors and most are amongst the best for locality and/or species.

Acquisition of this material stemmed from **Brian's very great interest in the geological sciences** since early childhood and began by the accumulation of anything that looked interesting. Among his earliest memories are of the severe caning levied by his primary school headmaster after being discovered digging up leaf fossils in a quarry on Stockade Hill at East Maitland instead of attending classes. This site was then a source of the finest examples of the Permian flora *Glossopteris*, *Gangamopteris* and *Noeggerathoipsis* in the State, a fact that seemed to escape the attention of the schoolmaster! But those early specimens still form part of the fossil collection. Events such as this did little to **dampen Brian's enthusiasm and in the fol-**

lowing years countless trips were made to mining and mineral localities across the Australian continent with his father Ken providing both transport and a strong mutual interest, gradually accumulating a wealth of material and knowledge. The collection became huge and completely random in its objectives.

**Then in the early 1970's a deep and insatiable interest in minerals and collecting World-class mineral specimens was kindled and encouraged by a close association with that doyen of Australian collectors, Albert Chapman, whose outstanding collection is now on display in the Australian Museum, Sydney. During this association, which lasted till Albert's death in 1996, the collection matured and developed into what it is today, supported in no small way by specimens obtained through Albert and his contacts around the globe. Much of the previously collected material was sold off or diverted into separate collection of rocks and economic minerals, which are now used mainly for teaching and research, resulting in the publication of a number of landmark papers.**

More recently, Brian has moved into micromounting, that fascinating world of tiny crystals visible only under a microscope at a magnification of around 10 times. This



Gold in quartz from Dunolly, Victoria.  
Size 5 x 6 cm.

A recent addition acquired during the Hunter Valley Amateur Geological Society trip to Victoria in 2004.

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was initiated by a locality at Ben Lomond in New England which at that time provided truly spectacular material that could only be appreciated at magnification. It seemed such a shame to throw such beautiful material away just because it was too small to display in the mineral cabinet. This part of the collection is growing rapidly and has provided further material for research, particularly into the Zeolite Group, bringing the total number of publications now to over 100.

Mineral collecting has also led to a range of other related interests including photography, especially close-up and macro photography and the entire display collection has now been individually recorded on 35mm slide film. Many of these photographs have appeared in books and journals. Brian is also associate editor for the Australian Journal of Mineralogy and a Research Associate with the Australian Museum in Sydney. Mineral collecting has also led to a love of bushwalking and adventure travel, as some of the best localities are well off the well-beaten tourist tracks and difficult to get to.

Even today field collecting plays an important role in specimen acquisition, although mainly in the quest for micromounts. Brian has traveled extensively overseas in the quest for fine minerals, visiting mines and mineral localities in Russia, Bulgaria, USA and Mexico as well as buying at major shows including Tucson, Munich, Lyon and Paris. An extensive global network of contacts keeps him in touch with recent developments, ready to pounce on anything worthwhile.

Why collect minerals? Everyone collects **something, even if it's just useless garbage that we can't be bothered throwing out!** Ownership and aesthetic appreciation are probably the greatest drivers, but there is also a realization that mineral specimens are an important, often overlooked and under-

valued part of our natural heritage which cannot be renewed once lost. If looked after, a mineral collection is a collection in perpetuity, passing on through countless generations. Few collectors collect for financial gain, although many move into dealing as a way of financing additions and upgrades. Brian also moved into this area several years ago and still sells off surplus material occasionally at shows. But probably the greatest joy is showing a fine collection off to others, especially those totally unaware of this magnificent part of our natural world.

**Desmond Coke in his book "The art of Silhouette" (1913) described the dedication of the collector very aptly. "The collector is thought of as a crank by his acquaintances, a nuisance by his friends, a miser by his relatives and a deluded idiot by everyone else."** True perhaps, but who cares!

*Brian M. England 2004.*

## PHOTOGRAPHIC COMPETITION

### Saturday 5<sup>th</sup> June 2004

Started in 2003 as part of our 25th Anniversary celebrations, the inaugural competition was such a success it was decided to run it annually. Held this year in conjunction with the Soup & Slide Night, our second competition was equally successful.

Participants could enter up to two photographs in each of the following categories; Landscape, Geology, Humorous, People or Miscellaneous. Photographs had to be taken during an activity that occurred in the last 12 months.

All members present were asked to vote for their favourite two photographs, and Certificates were issued to First and Second in each category.

# Old Gold & Young Volcanoes - Geological Safari 2004

19<sup>th</sup> June to 27<sup>th</sup> June 2009

Safari Leaders: Brian England & Ron Evans.

*Day 1 - Saturday 19<sup>th</sup> June.*

Bus Drivers: Ross Staines & John Cater.

Newcastle to Albury.

Bus Travellers: Brian England, John & Janet Cater, Ron Evans, Norm Rabbett, Jan Harrison, Michael & Jenny Green, Ross Staines & Glenda Smith, Lyn Monkley, Jack & Betty Nyman, Ethel Raine.

The above 14 hardy souls participated in our 2004 Geological Safari into Victoria to look at:

1. recent volcanic landforms at Derrinallum, Camperdown and Colac, and
2. the geology and history of gold mining in the Bendigo and Ballarat region.

Because of the distance involved [almost 3000 km travelled] and hence individual fuel costs, those involved agreed to hire a bus and travel together. We were very lucky in that John and Ross were licensed to drive the bus and thus share the driving.

Brian and Ron were the safari leaders, and Ron and Brian had prepared a set of background notes on the main sites to be visited.

The touring party met at the Cater Residence by 6.30 am, and amidst much packing, unpacking, re-packing and re-arranging, we were finally ready to depart before the 7.00am deadline. John was our driver for the first part of the trip through Sydney.

Morning tea was taken at a truck-stop beside the Hume Highway just South of The Cross Roads near Ingleburn.

After a driver swap, our bus continued South on the Hume Highway until we reached the service centre near Yass which was our lunch stop. By now, it had become cold, and light rain was falling.

The welcome break over, it was back onto the bus and the journey continued South until Tarcutta was reached where a short leg-stretch and pit-stop was undertaken.

Finally, we reached our accommodation in Albury the Albury Motor Village at Lavington.

Light rain was still falling and so the unpacking and settling into cabins occurred at a frantic pace.

The Commercial Club in Albury had been recommended for tea, so about 6.00 pm it was back into the bus and into town for tea. The Commercial Club was huge and very crowded [Saturday night]. However, we had a good meal and a few drinks before returning to our cabins for a much needed sleep.



Safari participants at the Central Debra Gold Mine, Bendigo.

Day 2 - Sunday 20<sup>th</sup> June.

Albury to Ballarat.

This was a relatively short trip of 400 km **when compared to the previous day's marathon.** Because we had most of the day to reach Ballarat, Ron suggested a detour to examine an outcropping of the Cobaw granite north-west of Lancefield. The group agreed, and so we followed the Hume Freeway South until Seymour was reached before turning West.

The road bordered the Southern end of the Puckapunyal Military Area and many exposures of folded basement rocks were seen in road cuttings. At Tooborac, we turned South and entered the granite country. The Cobaw granite weathers in such a manner as to form many spectacular boulders or tors.

After passing through the granite and reaching Lancefield, we again turned West and drove to Woodend passing the original Hanging Rock which is a large basaltic outcrop situated just north of Mt. Macedon.

Lunch was taken at Woodend where the Woodend bakery was discovered. Much to **Brian's delight, they had won an award for the best Vanilla Slices in Australia for the last 5 years.** We were assured that they deserved the award.

We reached Ballarat travelling via Daylesford in the afternoon. It was raining and cold in Ballarat, but we were made very welcome at the



Cobaw granite near Emu Flat weathered to form granite tors.



Jan Harrison preparing salad while Jack Nyman cooks.

Windmill Holiday park, our accommodation for the next 4 nights.

Vic and Leonie Mills met us at the caravan park. They had travelled independently with their caravan.

The park had a very well set up camp kitchen and so we all met, cooked, drank & talked about the next days activity which was to Bendigo.

Day 3 - Monday 21<sup>st</sup> June.

Ballarat to Bendigo.

Monday dawned cold and wet so our decision to drive to Bendigo and visit the Central Deborah Gold Mine and ride on the talking tram [all under cover] seemed wise. On arriving in Bendigo, we immediately went to the Central Deborah Gold Mine, purchased our tickets for the underground mine tour [talking tram ride included] and had a quick morning tea. Then it was on with the tour.

Because we were going underground, the first event was to select a hard hat and connect a **miner's light.**

Then it was into the lift and down to level two. The gold under Bendigo occurs in quartz veins filling tension fractures in strongly folded Ordovician Slates. The quartz veins are concentrated towards the peaks of the anticlines [up



Michael Green being equipped with his hard hat and miners lamp.



Pathway through Victoria Hill open-cuts, with the Victoria Quartz Mine in the background.

folds] and along fault planes.

Mining tunnels [called drives] were driven at right angles to the fold axes to intersect the gold bearing quartz veins. Once located, the gold bearing veins were stoped out.

At the end of the mine tour we boarded **Bendigo's Talking Tram** for an interesting and informative tour through the city with a stop at the former workshops, now the Bendigo Tramway Museum.

The afternoon was spent exploring the Victoria Hill Historic Reserve, site of intensive surface mining and also some of the deepest shafts on the field including the Victoria Quartz Mine. The open cut exposed colourfully banded and folded slates.



Gold-bearing quartz vein intruding Ordovician slates near the apex of an anticline. Actual gold was present & could easily be seen.

On the way home we called into view the foundations of the Garfield Wheel [a huge water wheel used to drive the Forest Reefs battery] located near Daylesford.

By the time we returned to Ballarat, the rain had set in once again.

*Day 4 - Tuesday 22<sup>nd</sup> June.*

Werribee Gorge.

Although Ballarat was still cold and wet, the forecast to the East was for clearing weather, so we headed off to visit Werribee Gorge some 50 km East.

Werribee Gorge is geologically significant because it displays some 500 million years of geological history exposed along its length and in the surrounding country.



Ready to board the tram in front of the Central Debra Gold Mine for a town tour and a stop at Bendigo's Tram Museum before returning to the mine site.

The diagrams below summarise the geological processes involved in the formation of Werribee Gorge.

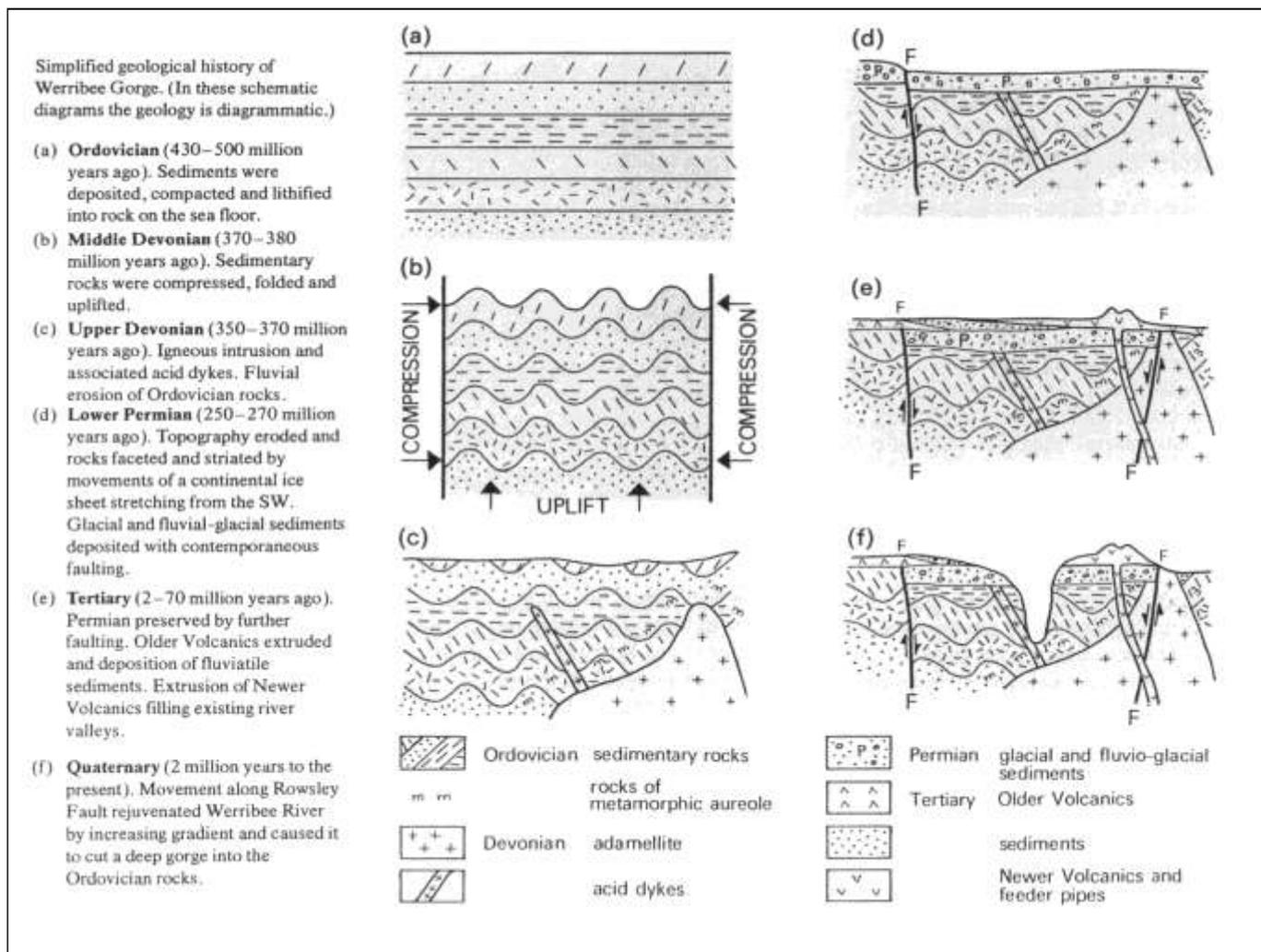
As we travelled East and started to drop off the Ballarat plateaux, the weather cleared and a beautiful day followed.

On leaving the freeway and on entering the park, we passed from Older Volcanics [37 to 66 MY old] down into the Permian glacial deposits [245 to 286 MY old] and stopped at the quarry picnic area. After morning tea, we were able to examine glacial rocks well exposed along the quarry face. Fine-grained shales and sandstones showing current bedding and tillites were the main rocks seen. The tillites were characterised by large drop-stones embedded in finer sediments. Wonderful examples of load casts were found also.

After boarding the bus, we continued down until the lower car park next to the Werribee River was reached. After organising ourselves, we set off to walk up the gorge to view



Permian glacial rocks exposed at the Quarry Picnic Park. Our bus in the distance.





Load casts — coarser material has slumped and settled into finer sediments.



Safari participants preparing for a walk to Werribee Gorge.



Glacial tillites—note the rounded drop-stones within the rock. These are dropped when ice rafts melt depositing their load of sediments.



Path following the viaduct—note sluice over viaduct to prevent damage during heavy rain.

the folded Ordovician basement rocks [438 to 505 MY old].

The path up the gorge was very well formed and level as it followed a viaduct used to carry water downstream to a water wheel, evidence of which was seen near the lower car park.

On moving up the gorge, the folded basement rocks became obvious, as was the angular unconformity separating them from the younger Permian glacial rocks sitting on top. The angular unconformity represented a time break of some 150 MY during which the basement deposits were lithified [changed to rock], compressed, folded and metamorphosed, uplifted and eroded before subsidence and glaciation deposited the Permian sediments on top.

At the beginning of the viaduct, the remains of a small dam used to divert water into it was observed.



Folded Ordovician rocks [syncline on left; anticline on its right] overlain by reddish Permian glacial rocks.

The track deteriorated into a bush track. Some of us pushed on to find a large acid dyke of upper Devonian age [some 350 MY old].

While this occurred, one of our members fell into the river near the old dam remains and



Rock hopping at the end of the well formed track. 'Norm's Folly' centre right near the yellow grass.



'The Island'. Its top, and the high country behind it is covered by olivine basalt, part of the Newer Volcanics.

had to be pulled out. We named the site 'Norm's Folly.'

After returning to the bus, it was back to Ballarat. As we drove up towards the highway, we had a very good view of 'The Island,' an isolated plateau covered with olivine basalt, part of the Newer Volcanics [1.6 to 5.3 MY old].

As we drove towards Ballarat, the elevation increased and we moved back into the cloud and light rain. Apparently it is the elevation of Ballarat that's responsible for much of its cloudy, rainy weather.



Michael Green next to a tightly folded anticline next to the track.

*Day 5 - Wednesday 23<sup>rd</sup> June.*

Ballarat & Sovereign Hill.

Another cold and wet morning. After breakfast, we headed into town. Brian wanted to visit the gold shop while Ron and Norm went to buy gloves and a beanie. Success on both fronts; Brian bought his gold nugget and Ron & Norm finally had warm extremities.

Then it was off to Sovereign Hill for the day where we basically 'did our own thing' for the morning.

After lunch, we met and walked over to the Gold Museum where samples of local gold and history of the gold fields were on display. The displays were very interesting and well presented.

We returned to the caravan park for tea and more warm clothing as most of us were returning to Sovereign Hill for the 'Sound and Light Show,' an explanation of the Eureka rebellion. The show commenced in the theatre at Sovereign Hill, continued in the village next to the gold panning area and then into carriages for a ride to the re-created gold fields where the final chapter of the story was played out with sound and light. Most impressive.

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Day 6 - Thursday 24<sup>th</sup> June.

Mount Elephant, Derrinallum.

Ballarat to Colac.

The 'Old Gold' part of our trip over, it was off South into a volcanic province known as the Newer Volcanics.

The western Victorian province which extends into South Australia is the largest volcanic province in Australia covering some 15,000 square km. Eruptions occurred from about 5 MY ago to perhaps 10,000 years ago. It is built mainly of small-volume lavas which flowed along existing drainage channels. About 400 eruption points have been identified. These consist mostly of scoria cones, spatter cones and broad lava domes, but with a concentration of about 40 tuff rings and maars to the south.

Upon departure from Ballarat, we drove south west via Linton and Skipton to Derrinallum, the home of Mt Elephant. None of us knew whether there was access for the public to the mountain, and as we drove around the scoria cone we chanced upon a local farmer and a truck full of cattle. On talking to the farmer, he explained that Mt Elephant had been owned and managed by the local community since 2000. He rang one of the management committee members who drove out of town and met us at the Ballast Pit Car park gates with keys to let us in. He explained the history of Mt Elephant, how it came to be purchased, where to walk and issued us all with a brochure.

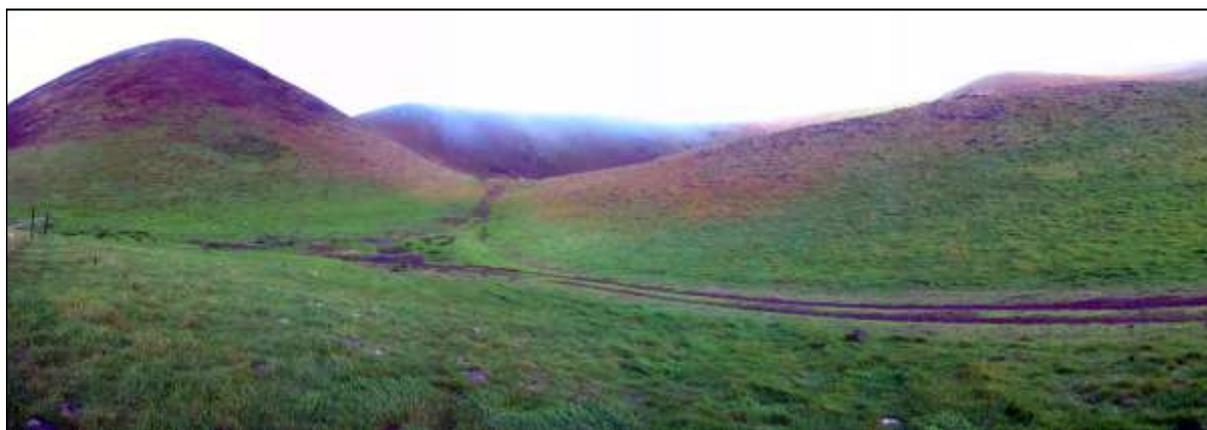
By this time, the weather had started to clear - sunshine and then the occasional quick shower, so most of the group decided to walk up the cone along a well formed road.



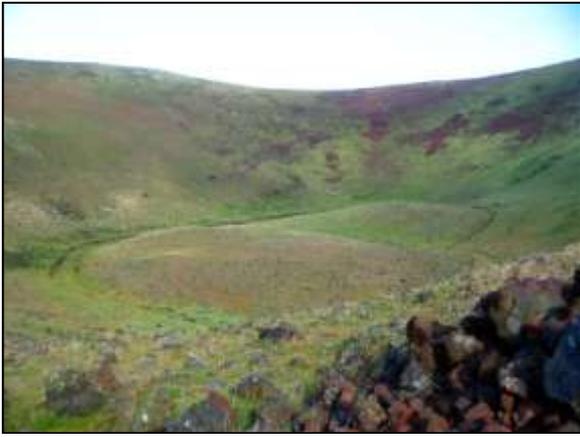
Mt Elephant, the largest scoria cone in Victoria's western Volcanic Province. Note the rocky nature of the soil in the foreground. These basalt blocks are characteristic of younger lava flows.



Walking track up Mt Elephant. The walls of the cone are very steep, characteristic of scoria cones.



Mt Elephant looking towards the main crater. The steep hill on the left is a small scoria cone.



The 90 m crater of Mt Elephant — Note the loose red scoria on the crater walls and the blocks of lava in the foreground.



Main crater viewed from the summit.  
Derrinallum town in the distance.

The scoria that forms the cone was obvious along the edge of the road - scoria [pieces of volcanic rock or glass resulting from explosive activity ranging in size from dust to boulders], volcanic bombs and blocks of lava.

As the road reached the top of the cone, it levelled off and a short walk brought us to the edge of the crater. Blocks of lava and volcanic debris were scattered about, and the scoria that formed the crater was obvious in the crater walls.

It was very windy and cold in exposed areas, so only five people decided to walk to the trig on top of the crater. The views of the cone and surrounding country were spectacular as we climbed up the cone. It was extremely windy on top of the crater. However, the flat nature of the lava plain and the location of other cones in the district were able to be seen. By the time we had returned to the bus, the weather was quite good. [i.e. not raining].



Our bus in the Ballast Pit car park.  
The Ballast Pit quarry operated between 1911 & 1916 to provide ballast for the local railway line.

It was a short 38 km drive to Camperdown where we had lunch.

Along the way, many examples of dry stone walls that are abundant in the Corangamite Shire were passed. These were built after the gold rush and introduction of the rabbit from the late **1840's to the 1870's to protect cultivated paddocks, homesteads, livestock and crops, and as a barrier against fire.**



Summit climbers. From left, Ron Evans [main crater behind], Lyn Monkley, Ross Staines, John Cater, Michael Green.



Dry stone wall near Derrinallum.



Large volcanic bomb from Mt. Leura. Under the skin of hard basalt, the bomb is filled with crystalline olivine.

An attempt was made in the 1870's to make the walls rabbit proof.

*Mt. Leura, Camperdown.*

Some lunch was purchased in Camperdown before driving to the top of Mt. Leura. From the top, more that 20 volcanoes [mainly scoria cones and maars] can be seen, as well as large shallow saline lakes.

Mt. Leura is a scoria cone which, together with several other smaller scoria cones including

Mt. Sugarloaf, are nested inside the crater of the Leura maar.

Unfortunately, it was very windy and cold outside and after a walk to the lookout, lunch was eaten in the bus.

Several quarries surround Mt. Leura, most disused. In one of these, Ron and Brian found magnificent examples of volcanic bombs.

After lunch, we drove west of Camperdown to examine two large crater lakes, Gnotuk and Bullenmerri which occupy maar craters.

Although the two lakes occur side by side, the surface of lake Bullenmerri is higher than Gnotuk, deeper and contains brackish water while the water in Gnotuk is three times as saline as the sea.

Evidence in the maar walls indicate that at least two separate maar eruptions occurred, probably representing the separate eruptions of Bullenmerri and Gnotuk. Layers of bedded tuff were observed in the road cutting between the two lakes.

After this very interesting and scenic drive, we headed to Colac Caravan Park for our overnight stay. Happy hour and dinner was partaken of in the RSL.



Rim of Mt Leura Maar - nests of small cinder cones in foreground.



Lake Gnotuk - note the scoria cones in the distance.



Lake Bullenmerri - Note Mt. Elephant in the distance.



Crater lake in the Red Rock Complex - the rim of the maar is the green ridge separating the small crater lake from lake Corangamite in the distance.



Bedded tuff in the maar walls.

Day 7 - Friday 25<sup>th</sup> June.

Colac to Echuca.

The usual morning - cold, windy and overcast. First stop was Red Rock Lookout [on the summit of a scoria cone] which gave excellent views of the Red Rock complex which consists of a number of maars and scoria cones.

The maars have wide, deep craters surrounded by circular tuff rings; many contain lakes as they are deep enough to intersect the water table. Smaller, shallower craters which lie within scoria cones are often dry as they are above the water table.

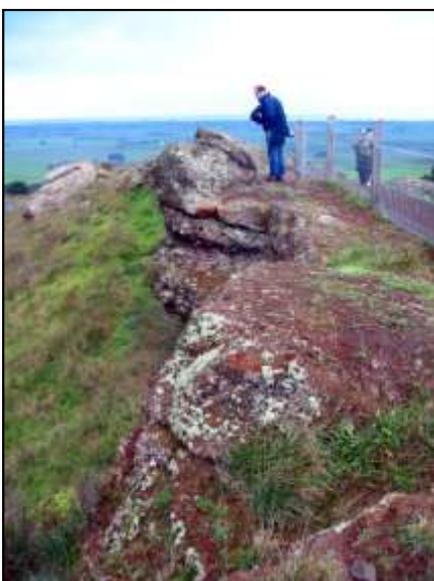
Oxidised red scoria was visible at Red Rock Lookout. The inner slope of the crater is capped

with spatter - this was clearly visible on the upper section of the slope next to the lookout.

Returning to the bus, we drove north following the shore of lake Corangamite. The road passed through wonderful examples of 'stony rises landscape.' These are formed from relatively young [last 10,000 years] basalt flows with very irregular rocky surfaces. Little weathering or soil development occurs.

Once back on the main road, we travelled to Ballarat for lunch and then through Bendigo before reaching Echuca and Moama, our overnight stop.

We were able to spend a couple of hours walking around Echuca township, in an Irish pub for 'happy hour' before dinner in the Moama Bowling Club.



Brian England examining the spatter-covered red, oxidised scoria next to the lookout.



Part of the Red Rock Complex from the lookout.

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*Day 8 - Saturday 26<sup>th</sup> June.*

Moama to Yass.

Along day. Upon departing Moama, we travelled north before turning east through the edge of the Barmah State Forest, the largest River Red Gum forest in Victoria. The forest is subjected to regular flooding and is an internationally recognised wetland.

An interesting fact is that an uplift of the land west of the present Barmah floodplain altered the course of the Murray River [originally through Deniliquin] to its present course leading to the formation of the present floodplain.

By the time we reached Yass, both drivers were very tired and in need of a rest. Ron booked a table at Yass RSL for our final dinner. In recognition of the wonderful job Ross and John had done by driving the bus everyday, they were shouted dinner by the group as a way of saying thanks for a job well done.

*Day 9 - Sunday 27<sup>th</sup> June.*

Yass to Newcastle.

The last leg of our 2004 geological Safari. The trip was uneventful and relatively quick.

The real action occurred after returning to **the Cater's. Frantic unloading and then the washing and cleaning of the bus**, with everyone helping. John and Ron were to return the bus to Sydney the next day and it was to be as clean as it was when picked up.

Then it was off home after a wonderful trip that is probably best summarised in the poem, '*Geological Safari.*'

*Report by Ron Evans & Brian England.*

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*Ron Evans.*

reading and suggesting minor amendments is appreciated.

Geo-Log 2004 was compiled and produced by Secretary Ron Evans, January 2005.

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**'Geological Safari'**

A poem by Jenny Green and Glenda Smith with critical input from Michael Green and Ross Staines.

**There was movement at the Cater's**

For the word had passed around  
That the Geol Mob were champing at the bit  
They were leaving for the Southland  
At the dawning of the day  
With picks and hammers ready for the fray.

Halleluiah they were ready to leave the hurly-burly  
And John was beaming broadly ear-to-ear  
But the weather turned quite nasty  
With wind and rain just ghastly  
But a servo tai chi demo  
Kept the ladies full of cheer

There was Ethel with her cross-words  
and Jenny with her coat  
and Ron and Mike with head phones on their ears  
Lyn, cosy in her ugg boots  
Brian dreaming of mew rocks  
and Jack and Betty always so at ease  
There was Glenda with a stiff knee  
Norm with yarns to tell  
and Jan relaxing quietly at the back  
There was Janet reading calmly  
Up front with all the guys  
While Ross and John were driving the whole pack.

They found scoria and tillites  
They found bombs and maars and cones  
There were features and formations by the score  
Crater lakes and anticlines  
**Tuff rings and gold what's more.**

They walked and limped and splashed around in river and in spar  
They drank and ate and happy-houred in café park and bar  
In spite of rain, wind and sleet  
They were a hardy lot  
Undaunted by the cold,  
Next year they plan an even cooler spot.