

'Geo-Log' 2005



Journal of the Amateur Geological Society of the Hunter Valley

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President's Introduction.

Hello Members and Friends,

It only seems like yesterday when the Planning Committee sat down to organise our activities for 2005 and here we are at the end of the year.

On reflection the Society has had a very busy year with excursions to Dunns Swamp, Beecroft Peninsular, Warrumbungle National Park and the Pilliga Forest. Somewhere in between these excursions we managed to fit our monthly outings.

There are many people to thank for the successful year:

- ◇ The Planning Committee for organising our activities.
- ◇ The Social Committee for organising social activities, our Soup and Slide night and our Christmas Get-together.
- ◇ The members that have allowed us to use their homes.
- ◇ The Leaders and organisers of our activities.
- ◇ Ron for editing and compiling the Geo-Log and our monthly newsletters.
- ◇ The contributors to the Geo-Log.

But without our members supporting the planned activities our Society would not exist. I would like to thank all members for making the Amateur Society of the Hunter Valley what it is today.

What is happening in 2006? It's all go starting with the Green Point walk and picnic tea in January and the safari to Tasmania in February. The planning committee is to organise the rest of the year so please feel free to offer suggestions for activities that you might think would interest our members.

Regards,

Ian.

Lake Macquarie Art Gallery & Lakeside Ramble Saturday 15th January 2005

Leaders: Jenny & Michael Green.

Attendance: 28.

An Un-geological Afternoon, divided into 4 stages:

Stage 1: Twenty eight members and visitors attended the Society's first activity for the 2005 year; a social afternoon of mixed activities. We started with a tour of the "21st Century Landscapes" at Lake Macquarie Art Gallery, reflecting on them to a background of live classical guitar, and a foreground of wine tasting (Jenny arranged this at the last minute after the restaurant closed for a wedding!!!!)

Stage 2: 'Kaffee mit Kuchen' in the grounds on the grass under the trees, near the wedding, with more "organised" musical entertainment provided by the wedding.

Stage 3: Walking (some intrepid people), Cycling (2 even more intrepid people), driving (others, more sensible) to Warners Bay.

Stage 4: Sumptuous fine dining on fish and chips etc. behind the bushes, under the trees, in the park, near the water, at Warners Bay.



L to R - Bob Grey, Elaine Collier, Chris Grey & Jenny Rose listening to classical music in the Art Gallery foyer.



Afternoon tea in the grounds of Lake Macquarie Art Gallery.



Fine dining Warner's Bay foreshore.

Report by Jenny & Michael Green.

Geo-Snippet

- ◇ Australia forms part of the Indo-Australian Plate. During the last 35 million years, Australia has moved North over a stationary 'hot-spot' forming a chain of volcanoes.
- ◇ The oldest volcanoes have mostly eroded away. However, spectacular remnants still remain as plugs & spires.
- ◇ The first & oldest is at Cape Hillsborough in Northern Queensland (you may have seen the Pinnacle). Next, the Glasshouse Mts. (25 MY old), then Mt. Kaputar (17-21 MY old) followed by the Warrumbungle Mts. (13-17 MY old) and lastly, Mt. Macedon in Victoria. (6 MY old)

Mulbring Quarry & Kitchener Fossils Saturday 19th February 2005

Leader: Brian England.

Attendance: 19.

The Buchanan Rail Tunnel.

Once one of the most important geological sites in the Hunter valley, the cuttings to the tunnel are now so overgrown and degraded that many of the unique features for which it was known worldwide have been obliterated.

Permian Marine Fossils at Kitchener

With entry into the Mulbring quarry to collect fossils from the Fenestella Shale thwarted by the appearance of a rather recent work cover sign on the gate warning impending visitors not to enter **without the owner's permission, our little convoy** re-assembled and moved on to Kitchener, on the Kitchener Road just south of Cessnock. The weather had turned out really hot and extremely humid, but we managed to park well off the road in a grassy area opposite the Khartoum Hotel, where a number of large ironbarks provided some welcome shade and a pleasant spot to have lunch.

After lunch, we pooled vehicles so that only the 4WDs would make the trip to the collecting area. Here our intention was to examine the extraordinarily-rich and well-preserved marine fauna of the lower unit of the Branxton Formation, exposed on the southwest side of the Lochinvar Anticline. The locality is easily found by following the rough track along the power transmission line to the top of a low ridge, about 3 km to the west of the Hotel. The track had been **recently "upgraded" to facilitate the installation** of new steel power poles and we had no problem reaching the top of the ridge adjacent to the old fire tower site at the centre of the fossiliferous

outcrops. Here we found that a considerable amount of rock had been disturbed by heavy machinery. It was far too hot to do much collecting and after only a short time spent exploring the geology we retreated to the Khartoum Hotel for drinks.

The rocks of the Branxton Formation were laid down during a steady marine transgression (sea moving in over the land due to subsidence or rise in sea level) which followed the deposition of the largely terrestrial (land-based) Greta Coal Measures. The sediments comprise massive sandstones and conglomerates at the base of the formation with more sandstones and silty sandstones towards the top. The Branxton Formation is divided into Upper and Lower units by the Fenestella Shale, the best example of which is exposed in the Mulbring Quarry, which the Society will visit later in the year.

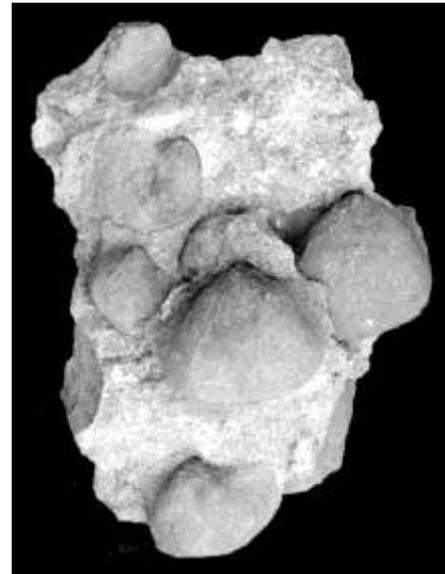
At the Kitchener collecting site, rocks of the Lower Branxton formation comprise fine to coarse limonite-impregnated sandstones and shaley sandstone in which relatively thin discontinuous layers contain an extraordinarily rich marine fauna, preserved intact and undistorted by diagenesis. Many of the fossils are articulate, and cavities left by leaching of the original shelly material by groundwater result in loose internal casts which, with care, can be removed from the sandstone intact. Another notable feature of the fossils at Kitchener is the extreme thinness of their shells, especially in the fragile gastropods, and yet most have been preserved intact with no signs of damage. Hence the depositional environment in which they lived must have been very low energy not intertidal or beach face where such thin shells would have been quickly destroyed by wave action and abrasion, but more likely sandy tidal mud flats associated with a major river delta. Occasional small specimens of driftwood and *Glossopteris* sp. Leaves also suggest a strong fluvial influence in a brackish environment. However, the area must have also remained open to the sea, at least periodically, as shown by the abundant drop stones of mainly volcanic rocks from a few cm to over 0.5m in

diameter associated with the fossils. The articulate nature of many of the shells suggests an advancing zone of live burial as sedimentation and other conditions gradually changed with the advancing ocean.

The range of fauna at Kitchener is unique. There is a large number of spiriferid brachiopods (lamp shells) including *Ingelarella*, *Martiniopsis*, *Dielasma*, *Trigonetra* and several undescribed species.

Productid brachiopods (typified by a large convex pedicle valve and a smaller concave brachial valve) consist almost entirely of the species *Terrakea*, which being colonial in habit are usually found concentrated in patches. Their shells possessed long curving spines on the pedicle valves, which helped to anchor them to the sediment surface and resist tidal currents. Superb examples of the snail-like gastropod *Keenia ocula* are also locally abundant, but the much smaller *Peruvispira* is quite rare. Also rare are examples of the small nautiloid *Warthia*. Pelecypods are common, with *Chaenomya*, *Maeonia*, *Deltopecten* and *Aviculopecten* being the most abundant forms. *Aviculopecten* can reach quite large sizes.

Polyzoa (the so-called soft corals) are rare and include isolated small colonies of *Fenestella*, *Stenopora* and *Trachypora*. The Pteropod *Conularia*



Brian England

Productid Brachiopods - Internal moulds of the large Pedicle valves.

(a small squid-like animal) has also been found, its chevron-marked square tubular body case forming one of the most unusual of the Hunter Valley fossils.

Intending visitors to the site should remember that it is virtually inaccessible after rain and it is alive with tiger snakes during the summer months.

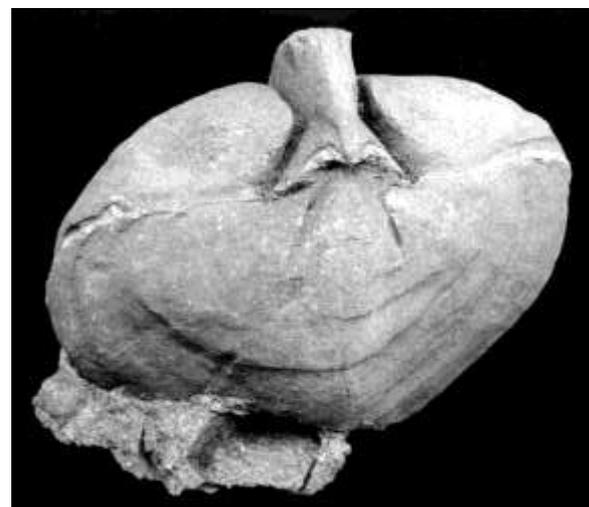
Reference: ENGLAND, B.M. (Unpublished). The Hunter Valley. A geological heritage.

Report by Brian England.



Brian England

***Keenia ocula*. Internal mould of the Gastropods shell.**



Brian England

***Martiniopsis* - An internal mould of the Brachial & Pedicle valve across the hinge-line.**

Rocky Crossing Walk Saturday 12th March 2005

Leader: Barry Collier.

Attendance: 12.

Starting time was 9.30, with 4 starters. By 10.00 there were 12, so we informed the guest house that about a dozen people would be arriving for Devonshire Teas later in the afternoon and headed off to Lagoon Pinch in the most glorious conditions. No wind, no clouds and crystal clear air. There should have been 15 starters, but three arrived too late, after being unable to find Barrington House at Barrington (no names provided).

The walk started with a steep descent for 500 metres, then a 400 metre detour to Rocky Crossing, one of the most spectacular river scenes on the southern side of Barrington Tops. Here, the Williams River leaves a small gorge, via a 10 metre waterfall, then opens onto a boulder strewn plain for 100-150 metres before entering another gorge. The trail comes down to the start of the second gorge, opposite where Currawong Creek enters the river, over a beautiful, tree fern lined, 1.5 metre waterfall. Under normal conditions, with about twice the flow that we were experiencing, two 5 metre falls can be seen a short distance up Currawong Creek.

From Rocky Crossing, a fairly level trail passes through beautiful rainforest, interspersed with giant Blue Gums and Turpentines. Frequent stops were made while the mad photographers endeavoured to capture picturesque groups of toadstools. One moderately large tree had a literal skirt of luminous toadstools extending at least 5 metres up the trunk. What a sight that would be at night!

At The Pool of Reflections a break was made for a late lunch on the banks of the Williams, which must be the most beautiful river in



Barry Collier

Carol Lawler having a well earned rest along the trail.

the Barrington Tops. All of the other rivers have beautiful spots, but on the Williams, they seem to be never ending.

The reason for this is the combination of a number of factors. Firstly, it rises on top of the plateau. The Chichester is the only other stream on the southern side to do that. This means that the water gains considerable energy before valley erosion begins, resulting in more erosional ability. Then, the underlying geology is more conducive to gorge formation. Finally, the whole of the catchment is undisturbed. It is now all National Park, but because of the steeper topography in the Williams Valley, large scale forestry operations were undertaken in the Paterson, Allyn, Karuah and Tellegerry Valleys first and the National park was created just before operations were due to commence in the Williams.

The Pool of Reflections is a bit of a misnomer. Just below the trail is a pool, with some reflections of the steep, rocky bank on the other side of the river. Prior to the record breaking 1964 flood, there was a very large pool, dammed by boulders, but the ferocious flood destroyed the boulder dam, leaving the considerably smaller pool we see today.

After lunch we continued the walk through the beautiful rainforest, to the Barrington Guest House where we were welcomed with a special table and fantastic Devonshire Teas.

Report by Barry Collier.

East Maitland & Morpeth
Historic Walks
Saturday 9th April 2005



EAST MAITLAND 1833

Leaders: Brian England & Graham Dunlop.

Attendance: 21.

By 1823, several land grants had been made in the vicinity of Wallis Plains and in 1824 a regular boat service began operating between Newcastle and the lower Hunter districts. During this time, the beginnings of a town were being made at West Maitland. This site was generally unsuitable due to the periodic flooding of the Hunter River. After difficulties were experienced in obtaining land for the establishment of a town at Morpeth, Surveyor G. B. White defined the limits of the government town subsequently known as East Maitland.



Glossopteris leaf fossils from the quarry, Stockade Hill.

Within the design of this town there was liberal provision for public buildings, churches, schools and public reserves.

The town was officially proclaimed in 1833.

During the middle of the nineteenth century, the three towns of East Maitland, West Maitland and Morpeth dominated the affairs of the Hunter Valley. They were respectively concerned with administrative and government functions, commercial activities and port and trade activities.

East Maitland was regularly and spaciouly laid out with imposing and solidly-constructed administrative and other government buildings.

In comparison, West Maitland was dominated by shops and residences situated along narrow, unplanned streets near the river.

East Maitland Walk.

Participants met at East Maitland's Heritage Park on Stockade Hill. This was the site of the first schoolhouse in the region, erected in 1829. The building was also licensed for use as a **church and became known locally as "the Chapel"**. **It was from the school that the Rev. G.K. Rusden conducted church services until the first St. Peters church was constructed in 1843.**

The hill was also the site of the original Police Barracks and had a more sinister side. On November 30th 1830, five men were hanged here, but there seems to be no record of what they had done to deserve such a fate.

Before leaving Stockade Hill, we visited the site of an early quarry where beautiful plant fossils can be found.

Our party then moved to the site of the Glebe Burial Ground. This Church of England burial ground is the oldest cemetery in the Hunter Valley, with the earliest identified burial in 1828. It remained in use till around 1920.

Many district pioneers are buried here, including Police Magistrate Denny Day, Samuel Clift and John Eckford, who lie side by side with soldier and convict, Protestant and Catholic. There are many graves of immense historical value. The massive Clift Vault was said to be the largest and most ornate in the Colony outside Sydney.

Sadly, the site has suffered significant degradation and vandalism and only 16 years ago it was almost re-developed as a housing estate. Headstones were taken away and used as flooring for a local dairy and wrought iron fencing was stolen to decorate homes and gardens. Many of the graves were simply desecrated for the lead they contained, scattering about the bones of the deceased. One of the desecrated graves was that of the Rev. Rusden himself. His bones were later gathered up and re-interred in the grounds of the present St. Peters Church along with his original headstone. The site was cleared of lantana only



Glebe Burial Ground East Maitland.



Weathered remains of the Clift Vault.



St. Peter's Church of England on William Street.

recently and has now attracted the attention of archaeologists and conservationists.

Adjacent to the burial ground and hidden by scrub is the large quarry from which the white sandstone used to construct the present-day **St. Peter's Church** was cut.

On returning to Stockade Hill, our group then walked down William Street to St. Peters Church of England. This elegant Victorian church, built in decorative Gothic style, was commenced in 1886 and remains incomplete. It has a slate roof supported by New Zealand hardwood frames. Jane Eckford imported the pulpit of marble and alabaster from Italy. The famous Dr. Evatt, who became Chief Justice of NSW, was a member of **the St. Peter's choir as a boy.**

St. Peter's Parish Hall was erected after 1840 using materials from the original school house on Stockade Hill. The bricks are rosy sand stocks and the building originally had a shingle roof.

The walk continued & we passed the Lands Office (Designed by Government architect W.L. Vernon and built by Thomas Henley of Balmain in 1895. The lands office first opened for business on 1st January 1885 in the adjoining hall that was **leased from St. Peter's Church of England**), Smiths Flour Mill (established as a steam-operated flour mill by John Smith in 1844. Its sandstone second story built over a timber ground floor makes the building unusual) before reaching **Caroline Chisholm's Cottage.**



St. Peter's Parish Hall.



Carolyn Chisholm's Cottage in the present day Smith Street.



Graham Dunlop explaining aspects of Morpeth's history before leading us on a two hour walk.



Graham describing some of the early industries that occupied the river frontage in Morpeth.

After leaving Smith Street, we walked to East Maitland Railway Station passing historic buildings including Red Lion Inn, Eckford's Cottage, the Literary Institute, Cottage of Content Inn and Roseneath.

Cars were collected and we drove to Morpeth for lunch in the Ray Lawler Reserve before meeting Graham Dunlop, our afternoon leader. Graham is a local historian with a wealth of knowledge on local history.

The Morpeth area was granted to Lt. Close in 1821 and the town became a bustling river port in the 1830's and 1840's. The railway branch line from East Maitland to Morpeth opened in 1864 and was closed following flood damage in 1953.

Before starting our Morpeth walk near St. James' Anglican Church, Graham spent time informing us on aspects of the origin of Morpeth and on some of the local dignitaries & characters who lived in Morpeth. We walked down High Street before returning along Swann Street, the present main street, to Campbell's Cottage where our outing concluded.

Report by Brian England & Ron Evans.

Geo-Snippet

Indonesian Tsunami, 26/12/2004.

- ◇ It was the result of a **magnitude 9** under ocean megathrust earthquake that took place at a depth of 30 km in the Burma Microplate & the associated Java or Sunda Trench, a large subduction zone with its associated deep ocean trench.
- ◇ A piece of ocean floor about 1200 km by 100 km shifted suddenly up to 11 m horizontally & 15 m vertically.
- ◇ The energy released by the earthquake shifted the Earth's centre of gravity towards its core increasing Earth's rotation by 3 microseconds thus shortening the day. It also shifted Earth axis tilting it an extra 2.5 cm.
- ◇ In the week following, 110 earthquakes took place in the Burma Microplate with only 11 being under magnitude 5.

Dunns Swamp Weekend
Thursday 5th May to Sunday 8th
May 2005

Leader: Barry Collier.

Attendance: 10.

Dunns Swamp Geology.

The Greater Blue Mountains area, encompassing Kanangra-Boyd, Blue Mountains, Gardens of Stone, Yengo and Wollemi National Parks, is characterised by a large block of Narrabeen Sandstone, with an overlay of the similar Hawkesbury Sandstone towards the east. Both series of sandstones are of Triassic age.

These sandstones were formed by the deposition of water borne sediments, approximately 200 million years ago. The type of sediment deposited is determined by the flow of the water, with gravel, forming conglomerate, deposited by fast running water; sand, forming sandstone, deposited by not so fast running water, and silt, forming shale, deposited by slow running water.

While the Narrabeen sediments were all laid down at the same time, there is considerable difference in the resulting rock, depending on the conditions under which the original sediments were deposited. The rocks at Dunns Swamp, Katoomba, Narrabeen and Wyong, although all Narrabeen Series, are quite different in structure. In most cases in the Greater Blue Mountains, thin layers of shale were laid down in backwaters and lakes during a series of droughts. These shale layers weather more quickly than sandstone. This undercuts the overlying sandstone, which then collapses.

At Dunns Swamp, there is a very thick layer of sandstone with no intervening layers of shale. As a result of earth movements and severe changes in pressure, vertical cracks appear in the sandstone, called joint planes. These have tended



Caves forming in Pagodas on the Western edge of Dunns Swamp camping area.



Typical domes or Pagodas at Dunns Swamp.

to break the sandstone into roughly rectangular blocks.

Once exposed to the atmosphere, the greatest areas of weakness are the joint planes. Water running across the joint planes wears the rock in the vicinity of the joint planes more quickly than the centre of the blocks, and with no intervening layers of shale, the top of each block becomes a dome shape.

Where two joint planes meet, weathering on the edges occurs more rapidly. As a result, the rectangular blocks tend to become oval in shape. Minor differences in texture of the sandstone cause some layers to wear more quickly than others, creating the terraced appearance of the domes.

In some cases, usually by liquids seeping through the rock, sections of the rock are

weakened and when those areas are exposed to the atmosphere, they weather more readily by wind action, forming caves like those at the western side of Dunns Swamp camping area. Eventually the cave will extend too far into the rock for the ceiling to support itself and the cave will collapse, forming isolated tilted blocks of sandstone, like those on the western side of the big pagoda on the western side of the Dunns Swamp camping area.

Dunns Swamp 5th to 8th May 2005.

Dunns Swamp, on the Cudgegong River, approximately 25 km east of Rylstone, is an amazing place and although it is one of the jewels in the crown of Wollemi National Park, a swamp it is not.

In the 1920s, a weir was established on the Cudgegong River, to provide water for the Kandos Cement Works. It was constructed in a narrow valley in a spectacular series of pagoda formations in the Narrabeen Sandstones. The Narrabeen Sandstones are a prominent feature of the Triassic period and form the basis of the Greater Blue Mountains region.

In the area between Rylstone and Lithgow, large areas of amazing pagoda formations occur within that series of sandstone. At Dunns Swamp, they not only create a spectacular landscape throughout the locality, but where they form a vertical backdrop to the lower half of the reservoir created by the weir, they become in-



Brian England and Anne Clarke amongst the Pagodas on the way to Pagoda Lookout.



Barry & Elaine Collier (left) with Carol Lawler & John Eccleshall enjoying a paddle.

credibly beautiful.

Although the outing was from Thursday to Sunday, a number of people began arriving as early as Tuesday, but this report will only cover the official period of the outing. It was one of the most pleasant outings I have enjoyed and some would say Carol drinking wine from a schooner glass typified the enjoyment value. It appears **that Ron's space age caravan has a smoke detector**, and we soon discovered that Ron has a continual habit of burning his toast.

Thursday 5th

This morning we woke to yet another cloudless and windless morning, with mirror-like surface to the lake and mist rising from the water. By this time it was getting a bit ho-hum, so everybody slept in, except John and me who ventured off along the weir track and up to the Pagoda Lookout. What a sight, with pockets of mist in all the valleys and a crystal clear view of the whole of the upper Cudgegong valley.

Those of us who arrived early decided that we would have Thursday morning in Rylstone to stock up on provisions, while those arriving on Thursday were busy setting up camp. Needless to say we ended up at Bizzy Birds for some delicious coffee and even more delicious cakes and scones.

While looking around town, Carol spied a notice advertising Kandos markets on Saturday,

so it was decided that Saturday's outing would be a trip to the markets. Those of us more temperately minded were pleased to see Carol buy a second hand wine glass.

When returning to camp, John and I decided to go via Cox's Creek Road. What a marvellous drive, past spectacular groups of pagoda formations. Half way along, an ancient stone well with shingle roof and survey pegs (which indicated that it had been excised from the adjoining property, no doubt because of its historical significance) was discovered.

From the time we started to arrive, we noticed hire canoes lined up along the shore, but no one to hire them out, so after lunch I walked down once again to see if we could hire some. This time there was someone there, but he stated that the canoe hire was only available on weekends and holidays.

After chatting with him for a while, he decided that I had an honest face and if our group would keep an eye on things, he would give us some paddles, provided we kept them hidden while not being used. What a wonderful suggestion and we had some great moments on the water over the next couple of days.

That afternoon, Elaine and I took one canoe, while John and Carol took another and Jan took one of the small ones. The rest set off on the walk to the weir, with a detour to the Pagoda Lookout which gave a wonderful view of the area.



Jan Harrison & Brian England on an early morning paddle.



Reflections, Kandos Weir on early morning paddle.

With such beautiful weather conditions, they had a ball exploring the ridge that contained the Pagoda Lookout, while we had a marvellous time in the canoes on glass-like water. What a great day!

Friday 6th

Another spectacular morning, with cloudless skies, no wind, and mist rising from the water. Elaine and I took one canoe, Brian and Jan took another, and Ron and Ellen took a third and we headed off down to the cliff-lined section of the lake in spectacular conditions.

At the first of the spectacular cliff lines, we spent quite a bit of time photographing caves and incredible reflections before suddenly, someone turned off the lights. In a matter of minutes, the cloudless sky had turned a uniform grey. Apart from the loss of opportunity for more great photos, the weather change was equally fascinating and as wind did not accompany the clouds, we continued our travels through the amazing reflections.

We had made a reconnaissance of Nullo Mountain on Wednesday, but found nothing worth planning an outing to, so we decided to head off to Mt Coricudgy. Lo and behold, at the State Forest boundary, there was a locked gate. What a blow! While we were standing at the gate wondering what to do, two cyclists appeared from the direction of the mountain. They were undertaking a big loop, from Putty to Coricudgy

and back via Gaspers Mountain. They told us about a fabulous area in another section of Co-ricudgy State Forest which sounded very interesting to us. If we were going there, would we mind carrying their packs? Why not. So we set off along the road to the Red Hill entrance to the State Forest, while they intended going cross-country and would pick up their gear at the base of Mount Darcy.

You guessed it, There was a locked gate there too. We immediately drove back down the road, but could not find the cyclists. What do we do now? We decided that we would leave the gear at the gate and I should drive down to the nearest farm to explain the situation in case the cyclists came looking for answers as to what happened to their gear.

I met a most delightful lady, Kay Summers, who not only sympathised with our situation, but also offered us the use of a key. By this time, the cyclists had found out about the locked gate from a property owner and were cycling along **the road, passing Kay's property just as I was leaving.**

I drove back to the others and we proceeded into the State Forest through constantly changing environments, to the junction of our road and the Glen Alice Trail. There we had lunch in the most spectacular scribbly gum forest any of us had ever seen. During lunch, the cyclists caught up with us and stopped for a chat until we were ready to move on.



Elaine Collier enjoying the Scribbly Gum forest.

After lunch, we drove to the base of Mount Darcy and **dropped off the cyclists' gear.** We looked at the ascent road and decided, maybe another day. By this time the cyclists had caught up to us again, so we made our goodbyes, wished them well, and headed back to Glen Alice Trail.

We drove down the trail to the National Park boundary, where there was a sign **"authorised vehicles only"** and a quite steep descent. From there we went on foot to the start of a spectacular canyon, filled with rainforest, and walked along a road at the base of a towering cliff line with all sorts of interesting overhangs. What a place!

Saturday 7th

After all the glorious mornings, this morning we woke up to rain, albeit very light, but accompanied with low clouds and very dull light. After breakfast, we piled into cars and headed to market. At Kandos, we drove around and around, but could not find any markets. Elaine went into a shop and asked the owner if he knew where they were. **"Dunno" was the informative answer. "If they were on, where would they be?" "Dunno". After a bit more questioning, "Could be up at the church hall". "Where would that be?" "Up the road."**

At that point she gave up and we drove off to Rylstone and coffee at Bizzy Birds. While in Rylstone, Carol went hunting for the notice she saw on Thursday, but no luck. After another search, she finally found a tiny little notice about a street stall on the 6th May. Yesterday. She is going take a while living that down.

After coffee, we decided to travel back to **camp via Cox's Road, so that the others could see the marvellous scenery that those in my car had seen on Thursday.** About halfway along the road, we passed a large group of kangaroos grazing in a paddock. As soon as we went past, they all took off and tried to race us. After about 300 metres, two managed to get under the fence. One raced across the road in front of me, while the other, a

very large male, tried to leap over Brian's car, but only succeeded in landing on his windscreen, before bouncing over the car and then bounding into the bush on the other side of the road. The result was a broken windscreen and other damage to the adjoining panels. Brian then headed back to camp, packed up and headed for home before the windscreen collapsed.

On the way back to camp, I stopped at a group of pagodas, which I thought might be photogenic in the current lighting conditions. John and I did a bit of exploring, took a few photos, and decided that it would be worth going back after lunch.

After lunch, John, Ross and I went back to the pagodas and had a wonderful time clambering over these amazing formations, past fascinating caves and interestingly deformed trees. After two hours in the incredibly light rain, we were starting to get quite wet, so headed back to camp for some warm drinks and dry clothes.

In the meantime, Ron and Ellen explored the walking track to the east of the camping area and came back with glowing reports, while Elaine and Carol set out for the weir, detouring onto the trackless peninsula where they discovered an amazing vantage point. After checking it out next morning I think it is the best vantage point anywhere along the reservoir.



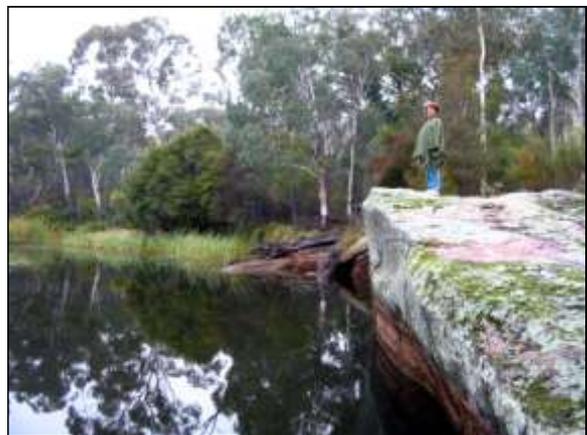
Looking towards boat ramp from the Weir & Pagoda Lookout track.

That evening, happy hour and after dinner chats were held outdoors, in the very light rain, around the fireplace. The damp weather had not only created wet clothes, but brought out the most amazing collection of giant moths, some like small birds.

The first few were amazing, but after a while, and the appearance of hundreds more, their welcome began to wear thin. Wherever there was a light, there were dozens of these giants, some drowning in washing up water and others ending up in coffee cups. During the evening slide show on my computer, they were crawling over the screen. However, the novelty of the giants outweighed their nuisance value and it became just another great memory.



Views along Cudgegong Picnic Area walking track.



Ellen Evans enjoying the view at the end of the walking track, Cudgegong picnic area.



Cudgong River from the main camping ground at Dunns Swamp. Note the small pagoda formations.

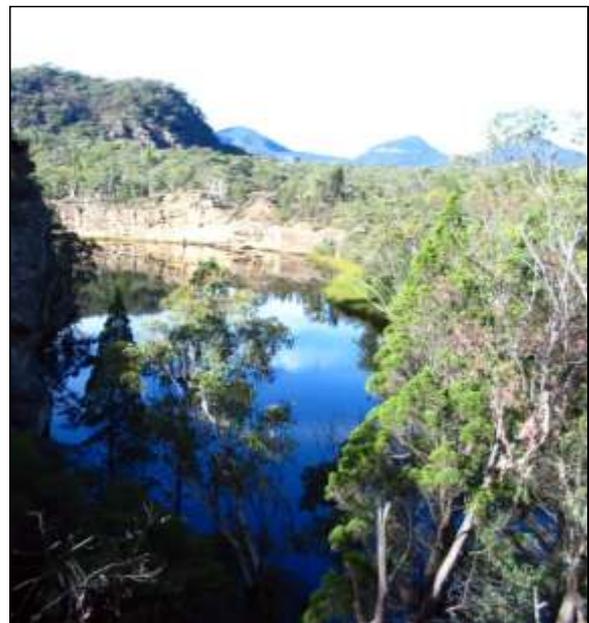
Sunday 8th

This morning, the rain appeared to have gone, but it was still very cloudy, so after breakfast everyone started to pack up. I wanted to have a look at the vantage point Elaine was raving about, so we went off to have a look. While there, the clouds suddenly cleared and a light breeze sprang up, so I decided we should do something for a couple of hours and then pack up dry gear.

Ross agreed, but everyone else continued packing. Ross decided to launch his canoe, while Elaine and I set out to explore the track Ron and Ellen had been raving about. Due to time constraints, we didn't see the whole trail, but were really impressed. Next time (there WILL be a next time) we will make a day of it and have a good explore. In the meantime, Ross had paddled to the top of the reservoir and was absolutely rapt with what he had seen.

As predicted, we packed up dry gear and headed for home after one of the most enjoyable outings Elaine and I had experienced.

Report by Barry Collier.



Kandos Weir catchment area - a beautiful place to walk by and to canoe on.

Geo-Snippet

- ◇ Wollemi NP, covering 487,500 hectares, is the second largest park in NSW.
- ◇ The largest remaining wilderness area in NSW is found in the centre of the park. It covers approximately 200,000 hectares.
- ◇ Wollemi is mostly Narrabeen and Hawkesbury sandstone laid down up to 250 million years ago.
- ◇ Some recent volcanic features such as volcanic necks, are to be found in the park.
- ◇ Since formation, the soft sandstones have been eroded to form enormous valleys and sheer escarpments.

Blackbutt Reserve Historical Walk Saturday 23rd July 2005

Leaders: Bob Bagnall & Paul Metcalfe.

Attendance: 22.

*The Macquarie Dictionary defines 'perfect' as
"Having every excellence."*

It was on a perfect winters morning that twenty two members of our Geological Society were greeted by Head Ranger Paul Metcalfe at **Blackbutt's Richley Reserve, Kotara.**

Paul gave us some background on the history of the area & offered to take us on a two hour excursion of the old mine sites & animal exhibits.

The tour was quite exhilarating, terminating with a magnificent morning tea organised by the Blackbutt Volunteers & held in the c1848 Slab Timber Pioneers Cottage.

It provided a lovely touch to a 'perfect' morning.



Head Ranger Paul Metcalfe explaining some background history on Blackbutt.



One of many stops along fire trails to observe old mining sites & to listen to Paul Metcalfe explain its history.

The afternoon was spent exploring the fire trails & geological landforms throughout the reserve. It was extraordinary to observe many native animals in their natural state including Scrub Turkeys (with their huge nests) & a 20,000 plus Fruit Bat colony located in the Southern rainforest area of the park.

Upon returning to Richley Reserve, we enjoyed a late lunch sitting on the grass alongside the lagoon.

The lagoon had held our attention earlier in the day when we watched the professionalism of **'Model Boat Captains'** plying their skills to their remote controlled boats on the lagoon.

All in all, what a day. In a word, 'perfect!'



Radio controlled model ship on the lagoon.

History - Mining.

It was in 1824 that representatives of the **Australian Agricultural ("AA") Company** stumbled across surface coal on the northern ridge of what we now know as Blackbutt Reserve.

In 1825 the first underground mine was sunk and became known as **"B" pit**.

The **"AA" land** was subsequently purchased in 1850 by the Scottish-Australian Mining Company who operated two mines in the area from 1850 to 1875.

In 1899 the site again changed hands and was purchased by a private mining company called Borehill Colliery.

Borehill Colliery operated in the Blackbutt valleys using **'pick and shovel' technology** until 1966 when mining machinery was brought in which lifted production to 660 tonnes per day.

The pit was closed in 1985 and the land handed over to the residents of Newcastle for residential use.

In 1993 the old mine site was renovated and reopened for public use by Hon. Joy Cummings (Lord Mayor) and named Richley Reserve. This recognised the lifelong efforts the local conservationist Joe Richley had dedicated to the area.

History - The Land.

During the late 1890's Newcastle was expanding westward at an alarming rate. The Hunter River controlled the northward growth of the city and southern growth was stopped by the steep hills of Merewether, Glenrock and Adamstown.

After the end of the First World War, the Kotara area was subdivided by the Lands Department of NSW into 70 and 80 acre lots. The 70 acre blocks lots sold for the princely sum of 1,400 pounds, while the 80 acre lots were almost given



Richley Reserve and lagoon.

away 1,600 pounds. The great depression arrived and the Lands Department found the lots difficult to sell.

In the mid 1920's, the NSW RSL purchased one 80 acre lot on the southern end of Blackbutt. The thought was that it might be able to be used by the **'shell-shocked' returned soldiers** as market gardens to form part of their therapy to return to normal life. For all sorts of reasons the project failed and the RSL sold the 80 acre farm to Lambton Municipal Council for half of the original purchase price.

In 1937, Lambton Council purchased the two adjoining lots of 80 acres giving them 240 acres of connecting land.

An act of Parliament was passed in 1938 (Municipal Amalgamation Act, Part 1) which allowed up to twenty small councils to be merged into one larger authority. So, in 1939, eleven local councils amalgamated into **'The Greater Newcastle City Council.'** Subsequently, **Newcastle City Council** took over the control of Lambton's Blackbutt Reserve.

Over the years, many proposals have been formulated for Blackbutt. Some of the submissions include:

- a) **In the 1940's, that the name be changed to "King George Fifth Park," or "The Duke of Windsor Reserve."**

- b) In the 1950's, that the site be used for the construction of a huge public zoo to rival that of Taronga Park.
- c) In the 1960's, that the site become the home of the Hunter Valley's Botanical Gardens.
- d) In the 1970's, that the site be occupied by a new privately run High School with playing fields and tennis courts.
- e) In the 1980's, that the site be split in half by the proposed Motorway 23 and the valleys be used as land fill for Newcastle rubbish.
- f) In the 1990's, the site be used to build a 60 m high lookout tower (with elevator) with revolving restaurant on top, and that commercial shops be allowed on the reserve to offset costs.

In conclusion:

At this point in time, the reserve covers an area of 375 acres (152 hectares) (even after the **subdivision of 227 half acre lots in the 1970's**).

The profit from the sale of the blocks at the Northern end of the reserve was used to construct the Newcastle Regional Art Gallery in Layman Street, Cooks Hill.

The park is made up of five deep valleys and four ridges. It is triangular in shape and owned under Torrens Title by the citizens of Newcastle. Fire trails within the reserve cover 37 km while walking trails amount to 53 km.

Geologically, the most conspicuous outcrop is the Charlestown Conglomerate which forms the cliff face beneath the New Lambton Heights Lookout.

Part of the Tickhole Formation, the Charlestown Conglomerate is resistant to erosion and has withstood the elements to provide a sheltered micro-climate for Blackbutts rainforest ecosystem.



One of many stops made during the two hour ramble through Blackbutt Reserve. Historical information was provided by Head Ranger Paul Metcalfe.

Stratigraphically beneath the Tickhole Formation are to be found shales, sandstones and coal seams of the Kahibah, Kotara, Shepherds Hill and Bar Beach Formations.

Moving down Carnley Avenue it is easy to observe how roadside works have exposed the Montrose, Wave Hill and Victoria Tunnel seams in turn.

The major workings of the old Borehill Colliery were in the Victoria Tunnel seam.

Our Blackbutt Reserve is a unique raft in an ocean of suburbia. **It's survival depends on many factors, not in least, the generosity of our 'City Fathers' and visitors top the park.**

As my grandfather often said,

"care for mother Earth. If only you knew how much she cares for you."

Blackbutt Reserve may not be perfect, but its very close to it!

Report by Bob Bagnall.

Muogamarra Nature Reserve Saturday 20th August 2005

Leaders: Ian and Sue Rogers.

Attendance: 26.

Despite the overcast weather an eager crowd of twenty six made an early morning journey south to meet at 9am at "Pie in the Sky", three kilometers north of Cowan. We then crossed the old Pacific Highway and traveled into the Muogamarra Nature Reserve. Muogamarra, pronounced Moo-o-ga-marra, is the Awabagal tribe's word for "preserve for the future". It symbolizes the purpose for which this area was dedicated. The reserve covers approximately 2,500 hectares and is managed by NSW National Parks and Wildlife Service. It is only opened to the public for six weekends a year.

After handing over our \$5 entrance fee, we parked at the Gibberagong Field Studies Centre. While waiting for our two friendly guides, Jill and Carol, to get organized, we had the opportunity to purchase a range of native wildflowers and browse through the interesting books sold by the NPWS volunteers.

After meeting our fellow walkers our journey into the rugged sandstone cliffs began. Our first stop was Tippers Lookout, named after John



Tour guide Jill Dalton explaining some history on Muogamarra at Tipper's Lookout.

Duncan Tipper. John had obtained a 250 hectare lease from the Crown Lands department in 1934 with the aim of protecting the area's flora, fauna and Aboriginal sites. He held open days during the wildflower season from 1935 and until 1953 when he surrendered his lease so the area could be reserved under the Crown Lands Consolidation Act. In 1969 the NPWS merged the Hallstrom Reserve with the Muogamarra Sanctuary to form the Muogamarra Nature Reserve.

The wildflowers along the way were a real treat - the profusion of pink Wax Flower (*Eriostemons*), crimson bottlebrushes, the glorious banksias, delicate native orchids just starting to bloom, tiny Darwinias, the spectacular Sydney Boronia, velvety flannel flowers in bud, and golden wattles which contrasted with the stunning red Waratahs that were just about to burst



Gibberagong Field Studies Centre
Muogamarra Nature Reserve.



Soft Boronia, *Boronia mollis*.

into bloom. Photographers were also kept busy with the sweeping views of the deep sheltered waterways of the Hawkesbury, the jutting dissected sandstone cliffs and the tall eucalyptus forests.

Our guides documented the history of the area. 50 acres of land was originally granted to George Peat in 1836. Bonded convicts built a road through the area in the early 1840s to a timber wharf at the mouth of Peats Bight. This enabled produce to be shipped to and from Sydney and a number of huts were built on the river's edge. From the 1880s to the 1940s the Wood family used the land around the crater for grazing dairy cattle and hence supplied milk to Brooklyn and the local river people, and for market gardens.

We then traversed along a rugged track to Deerubbin Lookout for views across to Cabbage Point and Milson Island and the Hawkesbury bridges. Morning tea was consumed at the rocky lookout before the return trip. This included a stop to observe aboriginal artwork on a flat sandstone outcrop.

We managed to munch on lunch between the rains back at the visitors centre. Most also had time to view the huge range of memorabilia housed in Tippers office. This timber hut was previously used as the waiting room at **Camperdown Children's Hospital** and as the **gatehouse** at Government House in the Sydney domain.

Despite the inclement weather, it proved to be a very enjoyable day rich in history, spectacular scenery and superb company!

Report by Sue Rogers.



A magnificent outcrop of tessellated pavement, our morning tea stop.



Participants enjoying the view over the Hawkesbury River from Deerubbin Lookout.



View upstream from Deerubbin Lookout. Milson Island can be seen in the distance.

Beecroft Peninsular
Thursday 8th to Sunday 11th
September 2005

Leader: Barry Collier.

Attendance: 15.

Beecroft Peninsula is situated between the northern half of Jervis Bay and the Pacific Ocean. Its southern point is Point Perpendicular, the north head of Jervis Bay, while the village of Cur-rarong is at the north western corner.

The geology of the area is dominated by a thick layer of very hard Permian Sandstone known as the Snapper Point Formation. Softer, underlying sandstone, exposed at the northern end of Jervis Bay and Culburra to the north, contains extensive exposures of marine fossils and an extraordinary display of concretions.

The eastern shores of the peninsular are flanked with vertical cliffs from 40 to 90 metres high, while the western shore contains low headlands, separated by some of the whitest beaches in the world, a legacy of the Snapper Point sandstone.

One of the main problems of exploring this area is that the southern two thirds of the peninsula, including all of the western shoreline, is in a navy firing range which is used about 100 days



Sandstone (Snapper Point Formation) forming the vertical cliffs that dominate Beecroft Peninsular.



Walking towards Penguin Head, Culburra.

per year. There is no schedule of use and visitors take pot luck on arriving. We had two days when the range was opened, Saturday and Sunday, both with less than ideal weather conditions.

The official outing commenced at daybreak on Thursday, when John, Tony and I ventured **out to Moore's Inlet to get photos of the towering cliffs** with sunlight on them. At this point the cliffs were approximately 50 metres high, while **Moore's Inlet, more aptly known as Moore's Chasm** on older maps, extended inland for about 200 metres and was narrower than it was deep.

It was decided to head off to Culburra and Crookhaven Head for the morning and return to camp for lunch in case others had arrived and wanted to participate in the afternoon. No one knew what, if anything, was there, but it seemed a pleasant way to spend the morning.

At Culburra we found a relatively low and uninspiring headland, clothed in recent residential development. Eventually a picnic area was found about 1 km from the end of the headland, from which a path led down to the northern side of the headland.

Once down there, we observed a level rock platform of 50 to 150 metres in width, barely out of the water, extending along the full length of the headland. At first there was nothing of interest, but John and I walked on ahead and came across the most amazing set of concretions. From **there, there didn't seem to be anything worth looking at** and most were about to head back, but

I ran on ahead and found a platform which seemed to have more concretions than bedrock and right at the end I found an extraordinary number of marine fossils, including some in concretions. We just had to bring Ron out here on Sunday.

After morning tea at the picnic area, we drove out to Crookhaven Head, where a short walk led out to an abandoned lighthouse. Two tracks led to viewing platforms. The eastern platform overlooked a level platform in which the strata formed a distinct, oval shaped basin - fascinating. The other platform looked out over a narrow peninsula of low lying rocks, with the new light, a small, automatic version, at the end of the peninsular.

A return was made to camp for lunch and to see if any others had arrived. Some arrived at about the time we finished lunch, but were too busy setting up camp to be interested in any activities, so a small group of us headed off to Red Point in the nearby Jervis Bay National Park, where a small headland jutted into the bay, separating two very long and very white beaches.

A stop was made on the way out to look at a stand of giant greenhood orchids, then a stop at Hammerhead Point, where an intertidal platform has created a distinct bump in the line of Curarong Beach. Some photos were taken of interesting sand patterns, before we returned to camp and discussed our finds with the other latecomers.

An early start was made on Friday, with a 9km walk planned, passing some of the most dramatic scenery to be found anywhere in Australia. **First stop was Moore's Inlet, where conditions** were not as favourable for photography, but everyone then had the chance to see this amazing piece of coastline, with kilometres of vertical cliffs in excess of 50 metres.

At Moore's Inlet we saw fishermen at the base of the cliffs. How they got there goodness only knows. Included in their equipment was a



Moore's Inlet.

kiddie's swimming pool with three rather large fish swimming around in it. At the time we thought they had been successful, but we later found out they were fishing for marlin and the fish in the pool were bait.

From there we followed a variety of trails to pick up the circuit walking track through Abrahams Bosom Reserve and then, in typical AGSHV fashion, followed the remainder of the trail in reverse. Most of the circuit passed through a magnificent example of coastal heath, with some stunning wildflower displays.

First stop was Merimbula Trig, where a magnificent viewing platform had been built to allow visitors to see no more than what they had already been seeing from the track.

Next stop was Becroft Head; at least that's what the signs said. The topographic map showed that Becroft Head was the headland at the south eastern end of the bay we were overlooking. Apart from stunning views, there were some interesting cliff formations, with sheer, vertical cliffs along major joint planes and amazing cliffs elsewhere, which looked like multiple stacks of sandwiches.

The next port of call was Mermaid Inlet, almost immediately below the so called Becroft Head. From there we were able to walk on a slightly tilted rock platform beneath the remarkable sandwiched cliffs. Between the layers at the base of the cliffs, we were able to observe multiple fossilised worm burrows.

We were able to walk some distance around the base of the cliffs, past a very large but rather shallow cave and some amazing scenery, including dramatic overhangs and everywhere those amazing sandwiched cliffs.

Back up on top of the plateau, we followed a trail to Gossangs Tunnel, but before entering it, we walked out to a cliff edge which provided magnificent views of Mermaid Inlet and Becnroft Head.

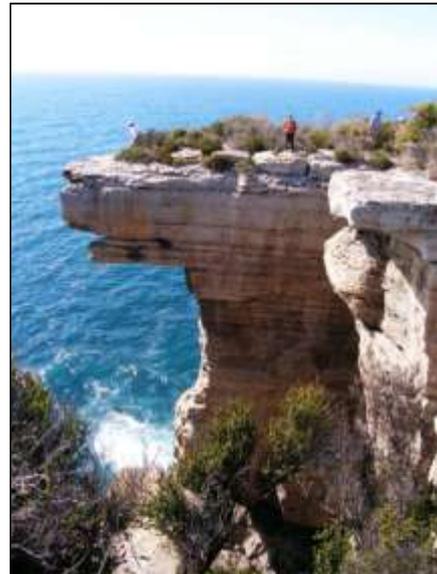
Gossangs Tunnel was an amazing feature. It followed a prominent fault line and was about 2 metres wide and a little over a metre high. The logical way to get through it was to crawl, but the surface was too rough on the knees, so it became quite comical watching the contortions undertaken by various people trying to get through. Halina reckoned the secret was short legs, but we **weren't all so blessed**.

The tunnel, about 30 metres long, opened onto a large platform ringed by 30 metre cliffs, with yet more amazing views of this spectacular coastline. Lunch was consumed on the platform, before we made our way back through the tunnel and then decided to leave the track and head up to the cliff top, which we followed to the north western end of the cliffs where we found a reasonably easy route down to the rock platform.

The narrow fisherman's track could not be found, so we decided to bash our way through the bush, eventually reaching a rock platform



Viewing platform, Merimbula Trig.



Large overhangs were common in the Becnroft Head region.

which extended around the edge of Lobster Bay. Unfortunately, the tide was high and a recent rock fall blocked our way, so it was back into the **bush, where we found the fisherman's track** and followed it back to the circuit track.

It was then decided to walk out to Honey-suckle Point, which provided extensive views of **Lobster Bay, before descending to Wilson's Beach** where we took a much enjoyed breather, looking across Whale Point and the remains of the wreck of the SS Merimbula.

From there it was back to the Abrahams Bosom car park, where Jan was waiting with a car to take the drivers back to the start of the walk to collect their cars.



Magnificent cliffs in the vicinity of Gossangs Tunnel which emerged about half way up the cliff to the left of the people.

Saturday dawned with leaden sky and hazy atmosphere, the sort of conditions that rob scenery of its natural colours. Because we only had two days to enter the firing range, we had no choice but to accept the weather conditions and head off into the naval lands. First stop was Point Perpendicular, where there were two lighthouses perched on cliffs more than 90 metres high.

The construction of a security fence ensured that nobody was able to get close enough to the cliffs to gain some appreciation of their height. One lighthouse was built in 1898 and has recently been replaced by a very modern automatic light. A group of enthusiasts have taken over the old light and are intending to bring it back to full use.

The old lighthouse keepers' cottages stood a short distance on the opposite site of the old light to the cliffs. The buildings appeared to have a lot of character, but fences keep visitors well away from them.

We had now been to the place that is mentioned in so many weather reports and seen an old (disused) lighthouse. Wow! Might be OK for some, but not us, so back at the car park an old trail heading for the cliffs was found. After a bit of scrub bashing we found ourselves on a bare rock platform on top of a 70 metre plus cliff with incredible views of similar cliff lines extending to the north. That was more like it.

Further along the road, I thought I saw a replica of Moore's Inlet through the trees, so we stopped the cars and did a bit of exploring.



Walking along cliffs toward Little Beecroft Head before climbing down to the rock platform.



Disused lighthouse (built in 1898) and lighthouse keepers' cottages.

The gorge was there alright, but there was no way we could find a view point into it. However, we did find an open sandstone ledge, albeit with a couple of narrow chasms to jump over, leading out to the cliff edge. The temptation was just too great for some, so a few of us headed out to have a look.

The views were so stunning that we went back and managed to cajole most of the group to head out to this new vantage point. The cliffs were around 80 metres and while still vertical, had the same sandwiched appearance as the cliffs around Mermaid Inlet. Not only were there some amazing cliffs, but there were also dramatic caves and overhangs as well. All agreed that this was the most stunning view of the whole trip.

By this time we were starting to get hungry, so we headed off to Honeymoon Bay for lunch. Honeymoon Bay turned out to be a roughly circular bay, about 100 metres diameter, fringed with brilliant white sand to the north, east and south, with a rock bar to the west, which contained a gap of about 20 metres opening into Jervis Bay. Even on such a dreary day, it was amazingly beautiful.

After lunch we walked out to explore the rocky foreshore of Jervis Bay and found a sloping sandstone ledge, about 6 metres high along Honeymoon Bay and sloping into the waters of Jervis Bay. The sandstone was unbelievably rugged, criss-crossed with narrow gaps, with the rock between the gaps incredibly weathered to pimples and hollows of all shapes and sizes.

From there we drove to another car park a few hundred metres away where we thought there would be a track of about 500 metres or so to Target Beach, which was supposed to be one of the highlights of the peninsula. When we got there, the signs informed us that target Beach was 4km return, or 5km via Silica Beach.

There was a bit of humming and hahing, before it was decided that there did not appear to be any steep hills, so why not. The track, most of which was a former 4 wheel drive trail, was delightful as it passed through some really beautiful bushland, before a set of steps leading down to Target Beach.

Target beach was beautiful; a crescent of sand, albeit not as white as most Jervis Bay beaches, about 200 metres long, with a series of hidden coves leading to the towering backdrop of Point Perpendicular. Even in the dull weather, it was a truly wonderful spot. On a bright, sunny afternoon, it would be absolutely stunning.

Most preferred to sit at the back of the beach and take in the views, while a few of us headed off to the headland at the far end of the beach, from where we could look into the much smaller, but still beautiful, Little Target Beach. The intervening headland was no more than 10 metres high, but constructed of the same incredibly weathered sandstone as the rock bar at Honey-moon Bay.



Eroded sandstone just North of Honey-moon Bay.

A couple decided to head straight back to the cars, while the rest of us decided on the 1km longer return journey via Silica Beach. After 500 metres or so of gradual up hill walking, the track descended through an ancient, captured dune, to Silica Beach, yet another beautiful jewel in the crown of Jervis Bay. This beach faced south west and on the headland to the south was a wrecked boat about 20 metres long. Its name was St Martin De Porres. The rigging and upper deck structures were long gone, but the battered and rusty steel hull was defying the elements and provided some interesting exploration.

After walking through more of the beautiful bushland of the peninsula, we arrived back at the cars, met the others and proceeded back to camp for a well earned rest.

On Sunday morning, after two days of rather **strenuous activity**, we decided on a 10 o'clock start. It was still cloudy, but there was an increasing amount of blue sky in the west and a steadily increasing westerly wind indicated that the sky



View south towards Point Perpendicular Light-house. Note the sea caves at the base of the cliffs.



Wreck of St. Martin De Porres at Silica Beach.

would clear before lunch.

Our first activity was morning tea at Culburra in the picnic area overlooking the beach. By now the wind was very strong, but was fortunately not cold. Although the heavy cloud cover had gone, there was an army of small clouds gathering above the horizon, warning that there would be no continual sunshine through the day.

On Thursday we thought the rock platform was close to sea level, but this time the tide was higher and we seriously wondered if we would be able to see anything. To make matters worse, there was a south easterly swell on Thursday, but now there was a north easterly swell breaking straight onto the platform.

However, in true AGSHV fashion, we were not going to be deterred by the occasional wet foot and still managed to have a great time wandering among the concretions and fossils which were not being regularly inundated.

A cake shop which sold nice pies and fabulous apple turnovers proved to be the next attraction after which we made a quick trip into Red Point for the benefit of those who weren't there on Thursday and adjourned to camp for lunch.



Eroded ironstone concretions in the rock platform at Culburra.



Fossilised Crinoid stems. Note how the segments have been displaced, probably by pressure during lithification and/or earth movement.

After lunch we returned to the naval lands, rather deterred by the strong wind, which would be howling off the bay, but determined to at least have a look at what the peninsula had to offer.

First stop was Long Beach North, where we walked down to yet another extensive crescent of beautiful white sand, but with the added distraction of the gale blowing off the water. I wanted to walk up to the rock platform at Montagu Head, but was quickly overruled.

I didn't worry too much as the next stop was Montagu Head, where I assumed we would be able to walk down to the rock platform. The only problem was that when we got there, there was no track. Bugger!

Next stop was Cabbage Tree Beach, a smaller white crescent, between Montagu Head and Cabbage Tree Point, but still fully exposed to the gale force wind. This time I put my foot down and stated that I was walking up to Cabbage Tree Point. If anyone wanted to join me they were welcome.

Cabbage Tree Point was a little disappointing, but there were some nice views around the corner and a few marine fossils in the rock platform. While the others were looking I stated that

I was going to walk down to Montagu Head and if I found anything I would wave frantically. What a decision. I did so much waving I thought my crook shoulder would become disjointed.

There were probably more fossils there than there were at Culburra, including two fragmented crinoid stems each totalling more than a metre. There were more concretions and a similar basin type formation to that which we looked down on from Crookhaven Head.

We had no trouble filling in the rest of the afternoon on this amazing rock platform and eventually made it back to camp just before dark, at the end of another fabulous AGSHV outing and absolutely enthralled with Beecroft Peninsula.



Fossil hunting northern end Cabbage Tree Beach.



“A hard life, but someone's got to do it!”

Report by Barry Collier.

Murrung Walk

Saturday 24th September 2005

Leader: Ron Evans and Brian England.

Participants: 11.

Coastal Section:

The coastal section comprises Carboniferous lavas of the Kuttung Series, mainly rhyodacitic ignimbrites, deposited as *nuee ardentes* (fiery avalanches) from volcanic centres now lying off the coast. Differential weathering of these rocks has left quartz and feldspar phenocrysts standing proud of the surface, giving both walkers and fisherman non-slip walking on the outcrops. Jointing in the ignimbrites has resulted in bold block outcrops which are a prominent feature of the coastline.

An obvious feature observed along the coast above the surf zone are large areas of smooth flat rock formed by spalling of the ignimbrites. Spalling, caused by expansion and contraction from changes in temperature, results in thin flat sheets of rock lifting away from the surface.

Within the surf zone, mechanical weathering by abrasion along joint planes in the rock, results in the release of blocks of rock.



Smooth ignimbrite outcrop caused by spalling. Note lighter area where thin sheets of rock have been removed.



Well jointed ignimbrites with blocks released by mechanical weathering.
Boulder beach in the background.



Closer view of the boulder beach showing imbrication (stacking in the direction of wave action). The largest boulders are deposited near the shore where wave energy is high, while the smaller ones (requiring less energy to move them) are carried further up the beach.

These may move about in the surf, become rounded and may eventually end up on the shore during high energy conditions forming some of the finest examples of boulder beaches to be seen anywhere.

Heathland:

The walking track through the coastal raised dunes is now well overgrown making it difficult to find and follow. Wildflowers were in abundance, including Boronia, Crowea, Correa, Hibbertia, Flannel Flowers and Wattles.

Report by Brian England and Ron Evans.

Soup and Slides Saturday 18th June 2005

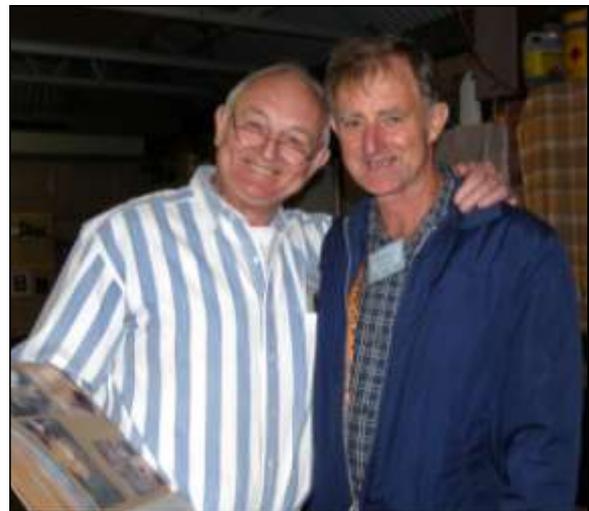
Guest Speaker: John LeMessurier.

This year, Soup and Slides was held in the garage at the residence of Ron and Ellen Evans.

35 members and 4 visitors attended.

After the usual excellent meal of three different soups, our guest John LeMessurier entertained us with an illustrated talk on his experiences while walking the Hume and Hovel Walking Trail in southern NSW.

John's presentation commenced with maps showing the path of the trail. He then described and illustrated with slides, many aspects of the trail including scenery, history and geology. A very interesting and informative evening.



Bob Bagnall (left) and John LeMessurier, friends for many years.

Report by Ron Evans.

Warrumbungle Mountains and Pilliga Scrub - Geological Safari 2005

Sunday 9th to Sunday 16th October 2005

Safari Leaders: Barry Collier and Brian England.

Participants: Barry and Elaine Collier, Brian England, Carol Lawler, John Eccleshall, Ron and Ellen Evans, Jan Harrison, Vic and Leonie Mills, Tony and Halina Turnbull.

The Warrumbungle Volcano
A brief geological history of the area visited

During the Jurassic (180myr) the region comprised large shallow freshwater lakes extending across a broad structural depression called the Coonamble Basin. Rivers flowing into these lakes deposited thick sequences of sands and muds as a series of coalescing deltas which subsequently lithified into the Pilliga Sandstone. A feature of some of the sandstone beds are discontinuous lenses and nodules of dark brown limonite (iron hydroxides), deposited from river waters as they entered the slightly brackish lake water. Also during the Jurassic, volcanic activity poured out large amounts of basalt, trachyte and breccias known collectively as the Garrawilla Volcanics, mentioned later as the source of World-class mineral specimens. Remnants of this volcanic activity include numerous dome-shaped hills in the Mullaley-Garrawilla area and extensive lavas and breccias exposed mainly in the valleys of Garrawilla and Mitchell's Creeks.

Just before the Warrumbungle Volcano came into existence, the area was very similar to the region north and east of Coonabarabran today. It was densely wooded, flat to gently undulating sandstone country that had been geologically quiet for some time. At the time the only active force was erosion, with rivers carving shallow

valleys across the sandstone.

One of eastern Australia's many "hot spot" volcanoes, the Warrumbungle Volcano began activity around 17myr, not long (geologically) after the demise of the Nandewar Volcano 100km to the northeast. By the end of its active life, it had formed a huge shield of eruptive rocks with a base area of around 1200 square km. Since volcanic activity ceased, erosion has removed most of the volcanic shield, exposing the very core of the volcano and resulting in the prominent spires, domes and dykes which characterise one **of Australia's most spectacular volcanic landscapes.**

Day 1 - Sunday 9th October

Settling In

On a rather pleasant, but cool day, 10 members turned up at the Warrumbungle NP with the prospect of some great weather over the next few days. Tony and Halina stayed in a cabin adjacent to a lead light gallery, which we immediately dubbed the Glasshouse, while the remainder set up camp at Camp Blackman. Ron and Ellen were expected to arrive on Tuesday to make up an even dozen.

Day 2 - Monday 10th October

Beloungery Split Rock Walk

After a rather cold night, we woke up to a beautiful day, with clear skies and almost no wind. On the previous evening, it was decided that a relatively early start would be made to tackle the walk to Beloungery Split Rock, a spec-

tacular, 300 metre high volcanic dome fairly close to the camp, which should provide spectacular views of the main features of the park.

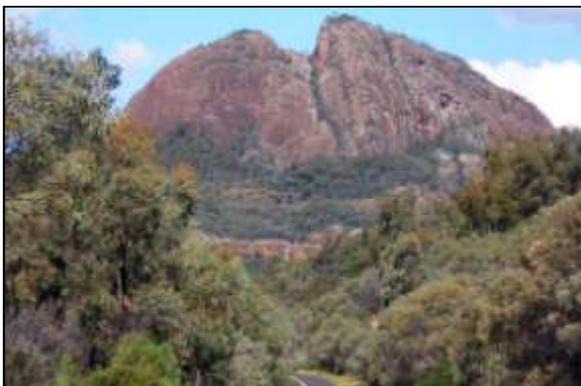
A circuit track of 4.5 km has been constructed around the peak, rising to within 100 metres of the summit. At the highest point of the track a marked route, with a few steps cut into the rock, leads up the final 100 metres to the summit. As expected, the views from the top were fantastic, especially on such a fine morning.

In spite of the fact that I was a co-leader and said that lunch need not be taken, we were back in camp for a not too late lunch.

After lunch we decided to follow a geological drive through the park and after a bit of mental arithmetic with the supplied figures, we were able to do it in reverse, which meant finishing up at Timor Rock at the best time for photographs.

Belouery Split Rock is a trachyte dome formed by growth and expansion from within, at least partly as a series of parallel vertical sheeted dykes, beautifully exposed beside the walking track on the eastern side. The dome is enveloped by a layer of breccia formed by fragmentation as the lava cooled and pushed out against the surrounding volcanic debris.

Blackman's Mountain visible in the foreground from the top of the rock is probably the largest of several inliers (an outcropping area older rock surrounded on all sides by younger rocks) of Pilliga Sandstone exposed within the deeply eroded volcano.



Western side of Belouery Split Rock as viewed from the road.



Barry Collier

Grand High Tops as seen from the summit of Belouery Split Rock.

Day 3 - Tuesday 11th October

Exploratory Day

Unfortunately, for this day and the following morning, all trails in the park were closed for goat shooting and transportation of trail construction materials. We considered going to the Pilliga, but Ron and Ellen were not due till that afternoon, so Pilliga was put down for Wednesday.

The sun rose to a beautiful, cloud free, day, so Brian and I took off to look for some early morning photographs, while Tony and Halina had organised an early flight over the park. On a day like that, the rest of us were decidedly envious.

Brian and I stopped off at White Gum Lookout, where the sun was in an optimum position for photographing the Grand High Tops, but the light was rather flat on Mt Exmouth and Belouery Split Rock.

We then travelled to Timor Rock and while Brian was wandering around, looking for that view of the rock, I wandered off to the east and found some beautiful trees and a species of *Boronia* found only between the Warrumbungles and Coonabarabran. Some of the trees made a lovely frame of the rock, so I called Brian over for some shots and then we headed back for breakfast.



Barry Collier

Early morning view of Warrumbungle NP from White Gum Lookout from Crater Bluff on the left to Bluff Mountain on the right.

Some decided to stay in camp, while a few of us decided to head for town and see what Coonabarabran had to offer. First stop was the Glasshouse, to collect Tony and Halina after their memorable flight and while there we decided to look at the gallery.

It turned out to be a really beautiful gallery, with a wide range of artworks and a tea room where they served beautiful coffee. Quite a few purchases were made, including some most amazing tee shirts.

At Coonabarabran, Brian introduced us to the Crystal Kingdom, one of the best single locality geological museums in Australia.

It was originally set up by Brian and Janet Head to display their huge collection of minerals from the Warrumbungle Range, most of which had been collected over many years from their own property just outside Coonabarabran. The museum is now owned by Nola and Wolfgang Bredereck who have recently renovated and significantly expanded the display.

The museum features principally two minerals of the zeolite group, stellerite and heulandite, both found in the area as exceptional crystals varying from white through to peach-pink to (in the case of some heulandites) deep red. Indeed, specimens from the Warrumbungle Range are the finest in the world. These minerals (along with analcime, prehnite, Laumontite, calcite and drusy quartz) can still be found lining large vesicles and irregular cavities in weathered basalt and volcanic breccia horizons forming part of the Jurassic Garrawilla volcanics (commenced some 200 MYA and ceased about 180 MYA) to the east and north east of the town. Over 90 localities, most on private properties, have been recorded in an area between Coonabarabran, Tambar Springs and Mullaley.

Also on display are local fossils including numerous examples of Murray Cod from the diatomite deposits at Chalk Mountain near Bugaldie deposited in a fresh water volcanic lake during the time of the Warrumbungle Volcano.

Then off to the Tourist Information Centre where, among other things, we heard about Pilliga Pottery. Tomorrow? Then back to town to buy lunch eaten in a delightful park on the bank of the river, just outside of town.

Next stop was Siding Springs Observatory, where we had a look at the visitors centre (retail outlet), then went up to the top of the largest telescope building, but nothing was working and there was little to see in the way of displays.



Stellerite



Heulandite

Brian England

Day 4 - Wednesday 12th October

Pilliga Scrub Outing

Another beautiful morning greeted us. Ron and Ellen had not arrived. We decided that it was today or never for Pilliga, so Ron and Ellen would unfortunately have to miss out. The Pilliga forests, about ½ State Forest and ¼ Nature Reserve is supposed to represent the largest unbroken stand of forest in western NSW.

First stop was Yarrigan State Forest, where we were supposed to find a fire tower, with expansive views, only a short walk from the car park. There were no signposts, but with a bit of judicious map reading, we found a little picnic area in the middle of nowhere and on the opposite side of the road a locked gate, with fire tower written on it, but no sign of a tower with expansive views.

We decided to walk down the road, through the gate and see what could be found. After about 200 metres, we found an old 4 wheel drive trail disappearing up a slope of about 50°. After climbing up the trail, two steps up and one step back, we reached a sharp crest, with a fire tower on it.

My information was that climbing the tower was prohibited, but that there were expansive views from the base of the tower. That may have been the case once, but all we could see were adjacent Cypress Pines. A sign stated that persons climbing the tower may be prosecuted, so I decided to take my chances and have a go.

Expansive views were certainly correct. The countryside was dead flat, except for the Warumbungles, away to the south, and I could see the horizon in every direction.

Next stop was Yarrigan Bore, one of many such bores which are supposed to provide drinking water for cattle and water for fire fighting. When we arrived there, we found a tall windmill, with a large tank at its base and a smaller tank



Barry Collier

Lunch at the Salt Caves, Pilliga Scrub

situated above the larger tank. Reeds were growing out of the smaller tank, up to 2 metres above **the rim and the drinking trough didn't appear to have seen water in the last millennium.** So much for watering cattle and fighting fires.

At Baradine we called into the forestry office, where a very pleasant lady explained that all of **the maps are out of print and won't be reproduced** until the NPWS decide how much of the forest they are going to take in December. Quite frankly I am appalled at the number of state forests being transferred to National Parks. Our population is increasing and we still need wood products, but the more forests are lost, the more pressure is being placed on the remaining forests.

We then drove up the road to Pilliga for several kilometres, to the start of the 'Pilliga Forest Way', which we followed to the Aloes Picnic Area, adjacent to Etoo Creek, where we were told there was a colony of Koalas.

Extensive searches failed to find any Koalas, but it was a good spot for morning tea. A large patch of Aloes occurs to the north of the picnic area, where a residence was established before the creation of the State Forest.

A lunch spot was taken at Schwagers Bore, another site with an unused windmill, but this time on the banks of one of the two Rocky Creeks, which flow through the Pilliga. This one consisted of a broad strip of sand, with not a rock in sight.

After lunch we continued along the 'Pilliga Forest Way', to Lanes Mill Flora Reserve, where we then drove along a succession of logging tracks to the Gilgai Flora Reserve. Almost as soon as we reached the flora reserve, we began passing a series of small Gilgai.

Gilgai are small mounds and depressions that occur in level or gently sloping areas where clay soils, showing high expansion with seasonal changes of water content due to marked wet and dry seasons, overlie thick sub-soil clays. The process is still not fully understood, other than the involvement of alternative swelling and shrinking associated with wet and dry periods. They can develop very rapidly, reappearing within a few years after being levelled by cultivation. Fence posts have been known to have been thrust out of the ground just three weeks after emplacement.

We stopped at a rather attractive, small Gilgai and were surprised to see fish scales scattered all over the floor of the depression. After a short while, we realised that no one was going to catch enough fish to create all these scales, so a closer look was made and lo and behold, they were transparent shellfish, a bit like 5 mm long pipis.

A couple of kilometres further on, we came across a large Gilgai, which had water in it together with plenty of bird life. Scattered trees were reflected in the glass-like surface of the water, a quite incredible scene.

From there we retraced our steps for about a



Barry Collier

Reflections in a large Gilgai, Gilgai Flora Reserve, Pilliga Scrub.

third of the way from Schwagers Bore to The Al-oes, before turning off and driving down to the Salt Caves, where a picnic area and fire tower have been constructed on either side of a small group of caves in which salt is extruding from the walls.

After afternoon tea, we decided it was too late to get to Pilliga Pottery, so we enjoyed a picturesque drive out to the highway and then back to camp, where we were able to hear of the problems which had delayed Ron and Ellen.

Day 5 - Thursday 13th October

Grand High Tops Walk

Now that we were all together and the tracks were open, it was decided to tackle the Grand High Tops walk. This walk heads up Spirey Creek, then up the eastern side of the Breadknife to the crest of the range a little west of Beloungery Spire, known as Lughs Throne, almost 500 metres above the start of the trail. It then follows the range, past Bluff Mountain, to Ogma Gap, before descending along West Spirey Creek to the start.

First stop was Spirey Lookout, almost directly in line with the Breadknife. Then up a yellow (well, actually orange) brick road to the base of the formation which includes the Breadknife, followed by a staircase of about 300 steps which really took the wind out of our sails. The staircase ended at about the saddle in the Breadknife, where we were able to scramble up to the saddle and gain some fantastic shots.

From there we made our way to the high end of the Breadknife for some more photos, then across to another dyke which gave probably our best views of the Breadknife.

Once on top, many more photos were taken, not only of the Breadknife, but of our first views of Crater Bluff and the more distant Tonduron Spire. A suitable spot for lunch was selected and defences against Currawongs were put in place.



Magnificent grass trees besides the Pincham trail at the start of the Grand High Tops walk.



Bluff Mountain.



Beloungery Spire and the Breadknife.



Breadknife from the Grand High Tops.

Some of the stories of these birds with visitors' lunches that were circulating camp were almost frightening, but apart from some overt bludging, we had no problems with them.

We continued along the range, with stops at Dows Lookout and Point Wilderness Lookout and all along the second half of the range where there were spectacular views of the face of Bluff Mountain.

A rest period was undertaken at Ogma Saddle, before the descent down West Spirey Creek and the return to our cars.

The Breadknife, rising to 100 m above the ground, is a trachyte dyke that filled a large radial crack in the cone of Crater Bluff. Clinging to its eastern side, are remnants of breccia and ash through which the lava ascended. Bulbous masses of trachyte are visible where the lava was able to push its way through soft ash forming part of the cone.

Crater Bluff was probably the eruptive centre of the Warrumbungle Volcano and is so named because it now lies at the centre of a crater-like depression.

Beloungery Spire is a subsidiary volcanic neck associated with crater bluff and composed of the same trachyte. Pronounced columnar jointing is visible towards the top of the spire.

Bluff Mountain is a dome of trachyte with prominent columnar jointing curving outwards on its northern face.

West Spirey Creek: as the track descends, numerous examples of bedded ash and breccia are exposed underfoot, their soft friable nature explaining why so much erosion of the volcanic shield has taken place in the geologically brief 13 million years since volcanic activity ceased.

Day 6 - Friday 14th October

Local Culture

It was decided that we should have more of a relaxing day and it was decided that as we had to give Pilliga Pottery a miss on Wednesday, that would be our first stop.

What an eye opener. We drove up the highway for 20 km or so and then turned off onto what a sign said was a 10 km scenic drive. The bush was beautiful and we were used to travelling on out of the way gravel roads, but we really wondered how many people made it all the way out here just for a pottery gallery.

When we arrived, we were presented with what looked more like a hippy village and community factory. The place was unexpectedly large and talk about quaint. We were the only visitors, so we wandered into the gallery where very friendly staff showed us some the features of the place and invited us to watch a demonstration.

We sat and watched a girl produce some amazing art work on unfired pottery, before another wander around the facilities.



Pilliga Pottery.



Decorating a jug prior to glazing and firing.

Some needed a visit to the toilets and came back with the most amazing stories about the artistic facilities.

They also have self contained cabin type accommodation, so after a few inquiries, we were shown over the buildings. Absolutely fascinating. **We just have to organise a week's holiday there** sometime.

From there it was back to Coonabarabran to buy lunch and eat it in the lovely park on the edge of town.

After lunch we stopped at Timor Rock (another trachyte dome) to see if there was a trail up, and if so where it went. Once there, only a few were prepared to tackle the trail. Ron and I **tried a route up to the first tier, but couldn't make it.** Brian and I then moved further west to find another route. Eventually I found one, with great difficulty, but once on the tier, there was nowhere to go. I tried a different route down and it was a cakewalk. At some other time we will have to make a more concerted attempt at finding a route to the second tier, where the rock formations should be amazing.

We then adjourned to the glasshouse and although the tea room officially closed 5 minutes before we arrived, the staff were more than

happy to serve us, so that made a very pleasant finish to another great day.

Day 7 - Saturday 15th October

Gould's Circuit

Another brilliant sunny morning. We decided to walk Goulds Circuit, a track below the Grand High Tops, and the only track not graded as steep. It was graded moderately steep. Brian thought it would turn out to be fairly level, except for access routes to two lookouts. Well, it turned out to be not quite as steep as the Grand High Tops Walk, but no yellow brick road.

Steep tracks led to Febar Rock and Macha Rock, both of which provided superb views of the Grand High Tops. While we were at Macha Rock the clouds started to roll in and for a few minutes, the sky was so photogenic. As the clouds thickened, the light deteriorated, so we headed back to the cars and lunch at the camp.

Most decided to have an afternoon of rest, but I, being me, decided there must be somewhere worth going, so I decided to look for a picnic area in the Pilliga Nature Reserve, beside Yaminba Waterhole. Brian and Tony decided they would like to go and then Elaine reckoned that if she **didn't go, she might miss out on something**, so the four of us headed off.

The picnic area was at the end of the road going past the sandstone caves, but our information stated that the caves were closed to the public



Barry Collier

Sandstone Caves in the Yaminba Forest - view of the incredible weathering.

from September to December, so the road would probably be closed too. We later found that the caves were regularly closed to protect a nesting Peregrine Falcon, but the bird has since moved on, so the closures no longer apply.

Despite careful map reading, we could not find the other road to the picnic area through Yaminba State Forest. There was no signpost to the caves, but no road closed signs either, so we turned onto the road which we thought went past the caves.

A kilometre down the road we found a parking area for the caves and plenty of interpretive signs, but no closed to public signs, so maybe they are not closed after all. We continued on to the picnic area only to find no picnic area and what was probably a waterhole hopelessly silted up. **Oh well, let's have a look at the caves.**

The caves were unbelievably stunning. Elaine



View of the Grand High Tops from Febar Tor.



Barry Collier

Massive hollows eroded into the sandstone.

stated they were the best she has seen, while **Brian thought they were on par with Richter's Caves**. We just walked around and through them in stunned disbelief and took photo after photo. What a place!

The weather since lunch had been full cloud cover, but with no sign of rain. I went over to **Ron's caravan to watch the football and on the way home the weather was still cloudy**, but the moon was breaking through and it appeared to be clearing. At about midnight we were woken by the noise of rain on our roof and it continued to rain steadily for the rest of the night.

Day 8 - Sunday 16th October

Home

We woke to cloudy skies and steady rain and immediately became concerned about the three creek crossings that we had to negotiate on the way out. I went for a walk and was pleased to note that the creeks had not risen, but we still had to pack up in the rain and a sea of mud. A rather ignominious end to such a fantastic week.



Wonderful memories of a spectacular landscape from the Grand High Tops, Warrumbungle NP.

Report by Barry Collier and Brian England.

Newcastle Botanic Gardens Ramble Saturday 29th October 2005

Leader: Jan Harrison.

Participants: 10.

Upon arrival, our group met at 10:00 am in the visitors centre to admire some of the local art and craft on display. Morning tea was then ordered and enjoyed in the enclosed café area. Thus fortified, it was off to explore the Botanic Gardens.

The gardens were established in 1986 and their development has been due mainly to the efforts of an untiring group of volunteer workers. The gardens cover 140 hectares, much of which is still natural bush, mainly a Blackbutt (*Eucalyptus pilularis*) and Smooth Barked Apple (*Angophora costata*) association. Many themed gardens have been developed within the Botanic Gardens linked by several kilometers of well sign posted walking trails. Over 2000 different species of plants have been planted within these developed areas.

On our two hour ramble, we visited the Protea Garden, the Succulent Garden, Plants of the Hunter Region Garden, Hakea and Banksia beds, the Rutaceae bed, the Lamiaceae Garden and the Grevillea Garden. A picnic lunch followed.

Report by Ron Evans.



A section of the Succulent Garden.

Redhead Rock Platform Saturday 19th November 2005

Leaders: Ron Evans and Brian England.

Participants: 18.

Access to the coastline was provided via a well-defined and well-maintained track leading off Ocean Street at its junction with Cowlshaw Street at the top of the Bluff. At first the track descended slowly through dense heathland, and then continued as a steep deeply eroded gutter across which wooden planks had been anchored at intervals to provide crude steps.

As the rock platform came into view below, the path plunged vertically over a 20m drop, forcing us to climb down a series of shelves of hard sandstone separated by friable shale bands rich in leaf fossils and petrified logs. It looked scary, but a fall here would at worst result in a few abrasions before landing in the relatively soft stand of Bitu Bush covering the scree slope along the base of the cliff. A family group had already beaten us to this secluded and we thought relatively unknown spot, the children playing in a deep pool in the rock platform close to the sea, while some of the adults snorkelled in the small adjacent inlet, apparently quite oblivious to the marvellous geology which surrounded them.

Spread out before us along the rock platforms and in the spectacular cliff faces we found a



Climbing down to Redhead Rock Platform.



Intraformational soft sediment slumping exposed on the rock platform as a result of weathering.

multitude of geological features so concentrated in such a small area as to make this short stretch of coastline unique.

The track had brought us down to rock outcrops well into the Kotara Formation, a series of sandstones and shales deposited in meandering river beds and freshwater lakes back in the Permian. But there was something strange about the rocks on the platform here - fine grained sandstones apparently twisted and contorted as if thrown partly congealed out of some gigantic cement mixer. To the geologists in the group however, this was immediately recognised as a textbook example of intraformational soft sediment slumping, the intricate and dismembered folding the result of layers of soft unconsolidated sediment moving under the effect of gravity between more competent layers, perhaps initiated by an earthquake.

Further out towards the ocean, the rock platform displayed discontinuous lenses and nodules of soft dark brown limonite (iron hydroxide) and hard dense fine-grained siderite (iron carbonate) deposited as chemical precipitates as iron-charged river water met the slightly saline waters of coastal lakes into which they discharged their sediment load as fans and deltas. Many of the siderite lenses had been broken up into spectacular **“boxwork”** by **dehydration and shrinkage** after burial, the structures accentuated by the weathering effects of the ocean and salt-laden spray. The effect was best seen where the top of the lenses had been laid bare. Scattered amongst



Well jointed and differentially weathered (more weathering along the joint planes) limonite lens.



Magnificent example of tessellated pavement.



One of many large petrified logs.



Preferentially weathered sandstone. The raised rim has been hardened by iron minerals that diffused into the rock from fluids seeping through the joints. Note the incipient honeycomb weathering in the raised and essentially unaltered sandstone core.

these limonite/siderite bodies were large fossil logs (replaced by siderite) up to 2m in length. Since they lay randomly oriented and no stumps appeared to be present in the vicinity they probably represent drift wood dumped on river banks during floods.

Everywhere we looked lay spectacular examples of jointing - natural intersecting crack patterns in the rocks resulting from flexing of the tougher (more competent) beds during the formation of a series of gentle folds (such as the nearby Lake Macquarie Syncline) which deformed the area during the development of the Sydney Basin, of which this region forms the northern part. In some places the joints had been eroded preferentially, appearing as if etched out, and were often accompanied by incipient honeycomb weathering. In other places groundwater movement had deposited bands of colourful yellow iron oxides adjacent to the joints. But the most spectacular joint-related feature was found a few hundred metres to the north, on a small shelf of fine-grained sandstone just above high water. Here lay one of the finest examples of tessellated pavement imaginable. This particular layer of sandstone had acted as an aquifer between impervious layers, the upper layer now peeled away by erosion. Over millions of years, seasonal variation in water flow altered the composition of the rock adjacent to the joints, resulting in concentric layers of differing resistance to chemical and physical weathering. The result was an area of crazy paving almost too perfect to be natural.

The jointing has also provided lines of weakness allowing the intrusion of basalt dykes during the Tertiary and one prominent example was found in which a dyke actually jumps between adjacent parallel joints.

Further north along the coastline the more adventurous members of our group climbed down onto an extensive rock platform normally covered at high tide. They were treated to more spectacular examples of jointing and siderite lenses displaying larger scale boxwork than had been seen elsewhere. Barry raced off to explore the cliffs around the next corner but returned to report that there was nothing of interest - to the photographer anyway!

South of the access track the rock platforms gave way to a pristine sandy beach, widened considerably by the falling tide and studded with boulders fallen from the cliff face. Towards the southern end of this beach, mudstones of the Kotara formation lay exposed at the base of the cliffs and here we again found abundant fossil logs. A few were vertical (probably in the growth position) but most lay horizontal, with the enclosing mudstones clearly showing differential compaction around them. Above the shales, the lower split of the Fern Valley Coal Seam was clearly visible, itself split into two parts by a thin horizontal shale band. The upper part of the cliff here is composed of Redhead Conglomerate, a thick inter-bedded sequence of conglomerate and coarse sandstone deposited in a high energy deltaic environment and showing large scale cross-



Well jointed Redhead conglomerate exposed at the southern end of the rock platform.

bedding dipping to the north at up to 28 degrees. The conglomerate is cut by two intersecting sets of widely-spaced vertical joints filled by limonite and as the underlying shales are eroded away by wave action, huge blocks of conglomerate lose their support and fall onto the beach below. Adjacent to the joint planes the conglomerate has been case-hardened by weathering, but once this protective layer is breached large scale honeycomb weathering develops behind the joints resulting in spectacular craggy formations. The blocky nature of the jointing is most clearly seen by looking north along the cliffs from the southern end of the beach.

Around 4 pm clouds began rolling in from the west and the sound of distant thunder heralded the approach of the forecast late afternoon storms. Most people heeded the warning and headed off home, while a few braved the impending downpour to pause for coffee in the local park. But the storms were to pass us by, moving on to wreak their havoc elsewhere.

Report by Brian England.

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Petrified log exposed in mudstones of the Kotara Formation. Note the differential compaction (circular layers) around the log.

Annual Christmas Party Saturday 10th December 2005

Organisers: Social Committee.

Participants: 37.

This year, after a few grumbles about the quality of food presented by outside caterers over the last two years, the Social Committee decided that they could do better for the same cost and agreed to do the catering themselves for the Annual Christmas Party.

Several planning meetings occurred and many emails (not to mention phone calls) went backwards and forwards as the end of year approached.

After final numbers were obtained and monies paid, the committee went into action to prepare a wonderful meal of cold meats, fresh salads and scrumptious sweets.

Committee members and spouses met at our hosts (Vic and Leonie Mills) house after lunch and in no time at all had completed the preparation. While this was occurring, others set up tables and decorated the surroundings.

Members arrived from 5:30 onwards, sat around outside chatting, having a Christmas tippie and buying raffle tickets while waiting for the main meal.



AGSHV members enjoying a good chat while waiting for food to be served.



Vic Mills 'officially' announcing the 'dinner is served!'

After the food table had been set up, our host Vic gave us a trumpet fanfare to announce that **'dinner is served!'**

After dinner, the main raffle prize, a magnificent book on rocks and minerals was drawn, the lucky winner being Stan Madden.

Then the lucky door prizes were drawn. All members in attendance had placed a mystery **present on a table and as each persons' number** came out of the hat, they had the pick of the table. This event is always fun as many presents were wrapped, so what was inside?

President Ian then thanked all who attended, organised and led activities throughout the year, the Social Committee and hosts Vic and Leonie for the use of their home.



Social Committee members and co-opted helpers preparing the food table.

Acknowledgments.

A big thanks to all members who attended activities throughout the year. Without your support, the AGSHV would cease to exist.

A special thanks to all trip leaders who willingly supplied reports about the activities they organised and led. This has resulted in a more varied and interesting Geo-Log 2006.

Photographs included in this publication were supplied by Ron Evans unless otherwise acknowledged.

Glenda Smith once again proof read the publication before printing. Much appreciated Glenda.

Geo-Log 2005 was compiled and produced by Secretary Ron Evans, January 2006.

Ron Evans.