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Front Cover: Megan Pryke in Queenslander Cave,

Chillagoe

Photo Rod Obrien

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News and Gossip

Floods floods

October and November have had some memorable flood events, as we go through what appears to finally be the end of three years of La Niña. The caving areas in NSW were already very wet, from all the rain earlier in the year. In October, there was a huge flood on the southern tablelands, extending into the Lachlan catchment and downstream. Bungonia was particularly hard-hit by this event, with a Cave Rescue Squad exercise in Drum Cave turning into a self-rescue when this normally-safe cave flooded down the main pitch. Wombeyan was also hit, and damage was done to the construction works currently underway to the tourist zone there. This event also flooded Borenore - see the trip report in this issue of the Bull.

The heavy rain returned to the southern tablelands again in early November, pummelling Bungonia and

Wyanbene and once again causing major floods through inland NSW. See the trip report on Wyanbene in this issue of the Bull.

32nd ASF Conference, Ceduna

In April 2023 the biennial ASF conference will be held in Ceduna, South Australia. That's right on the road to the Nullarbor, the largest and most remarkable limestone karst area in the country. This is going to be a great chance to explore, map, and experience some of the best caves in Australia, plus the conference itself will host presentations on science, discoveries, environment and more.

Latest word is that accommodation in Ceduna is starting to get scarce; make your bookings soon.

https://asfconference2023.com



Nullarbor caving.... Megan Pryke in a popular Nullarbor Cave, with huge halite formations. Photo Alan Pryke.

Engelbrecht Cave extension

From ABC News:

https://www.abc.net.au/news/2022-11-08/engelbre-cht-cave-extension-discovered-under-mount-gambier/101624876

Engelbrecht Cave under Mt Gambier has been known and explored for the entire history of cave diving in Australia. It's pretty remarkable that after all this time a huge extension has been found. There are more exploration targets opened up as a result of all the new passages discovered so far, so this news story will probably evolve

and develop over the next few years. The video in the news link above is worth looking at, despite the speeded-up action making the divers look a bit silly.

The shallow, water-filled cave goes underneath the highway for hundreds of metres – so no absolutely problem to run B-doubles through the town!

From the ASF library

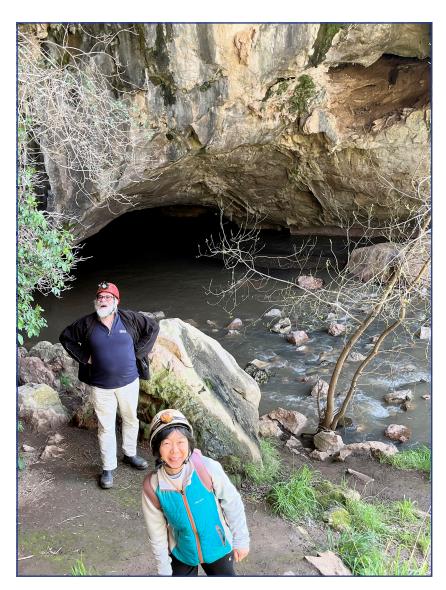
The ASF Library is not JUST a library. It's also a repository of historical caving equipment ranging from Club T-Shirts and Coffee Mugs to Carbide Lamps, Survey Gear, Abseiling Equipment and Cave Diving gear. If you are cleaning out the shed and need a loving home for your much-loved equipment the ASF Library/Museum would be happy to preserve it.

Please write some history of the equipment you are donating and if possible, a photograph of it being used.

Contact the ASF Librarian, Cathi Humphrey-Hood to get more information; asf.caves.library@gmail.com

A note on diving

SUSS divers are regulated by the current ASF Cave Diving Code of Practice and any other cave diving requirements such as those listed on permits. If you are planning a trip, make sure that management authorities have access to every diver's qualifications, get your permit lined up well in advance, and ensure that every diver is up to speed on the Code.



Helen Guo and Kevin Moore and very high water levels at Borenore Arch.
Photo Lily Guo.

Chillagoe - Mungana

June 2022

Text and photos Rod OBrien

Participants: Rod OBrien, Cathi Humphrey-Hood, Megan Pryke, Alan Pryke, Phil Maynard, David Stuckey, Paul Osborne, Peter Bannink

Time for the annual North Queensland pilgrimage to escape from winter. For cavers in Sydney the driving trip to Chillagoe can be comfortably done in 3 days. I had a brief stop in Rockhampton to catch up with some CQSS cavers. I also had a brief stop as I was driving over the Atherton Tablelands when a stubborn Cassowary would not get off the narrow winding road. While the Emu is taller the Cassowary is heavier and has been responsible for several attacks when cornered.

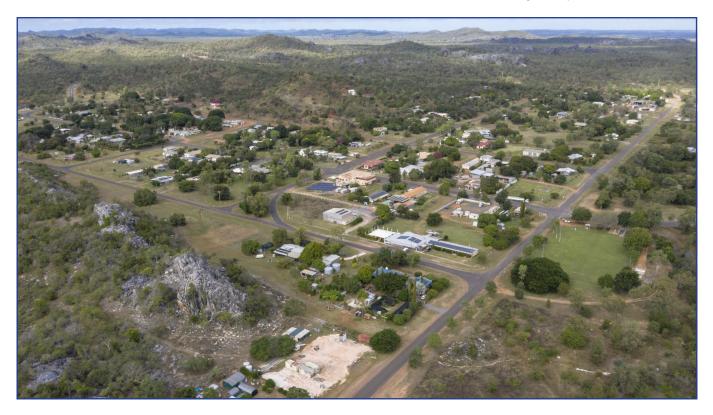
Chillagoe is a mining town that supplies Copper, Gold, Lead and Marble. If you have ever dreamed about making a living by chopping up limestone karst towers into large blocks of marble this is the place for you. Chillagoe Caving Club have the best cavers' cottage on the planet with all amenities and two pubs within walking distance.

We started the first week of caving with 5 cavers (CCC, SUSS and MSS). I was pleased to be informed that the undergrowth was particularly thick this year, yippee!

A typical approach to a karst tower consisted of wading through the grassland, bashing through the scrub that surrounds the perimeter of the tower then climbing up the scree slope to the tower base. A constant source of entertainment when navigating the scrub section was when you brushed up against a leaf-cutter ant nest in the bushes. Once the nest was disturbed, they would rain down on you en-mass. These little buggers really know how to bite.

We started looking at caves in the Mungana karst, situated north of Chillagoe. Castle and Magh caves were exceptional with plenty of decoration, large chambers and some sporty bits thrown in. We discovered some new passageways and surveyed them as we went.

We then ventured to Two Absent Friends, a new large cave located in the southern section of the Chillagoe karst. We spent all day in here surveying and taking photographs. The trip to get there involved piling all of the gear and people into my 4WD and driving along a bush track to a creek crossing. The creek had flowing water and as I drove through it my 4WD sank consider-



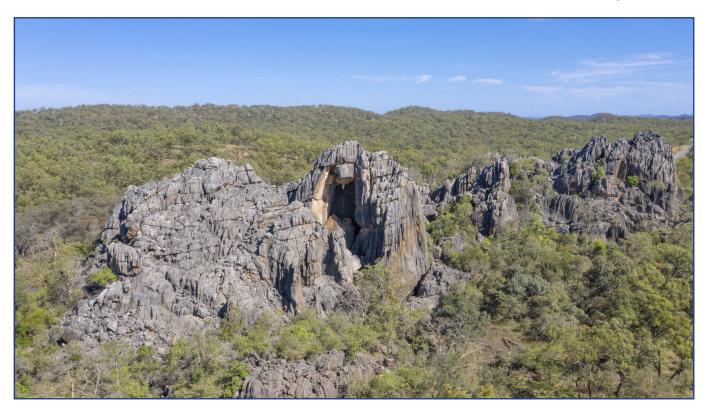
Tropical karst towers convenient to shops and transport..... Chillagoe.



Phil in Spring Cave.

ably into the soft mud. On the southern side of the creek the grass had overgrown the track and Megan had to walk in front of the 4WD to point out the many rocks and logs. On several occasions all I could see of Megan was her head.

At the end of the first week, we were joined by several more cavers, one being Paul Osborne from Chillagoe Caving Club. We had a recreation day frolicking around in Queenslander cave which was awesome. Most of the second week involved exploration and surveying. By the end of it we had looked at caves covering a vast area,



Haunted Tower..... Spooky.

from Mungana in the north to the southern section of Chillagoe. The caves varied from climb-into, laddering access, through to full SRT. Some are a bit "grikey" like Bullita but most have nice passages with high roofs and some large chambers.

On the last day I did some sightseeing around Chillagoe, checking out the old copper mine, QLD National Parks

tourist attractions, and even did a guided tourist trip into Trezkinn Cave. There are three caves with guided tours: Donna, Trezkinn and Royal Arch, as well as three self-guided caves open 24 hours a day: The Archways, Pompeii and Bauhinia. There are also some some good walking tracks in the area.



Alan in The Queenslander.

Cook Islands Cave Diving

Text and photos Rod Obrien

This expedition was organised by New Zealand cave diver Bruce Clulow. Bruce is part of our cave diving group and often flies across the ditch to join us on our cave diving adventures. Bruce had the support of Air Rarotonga as he used to work as a pilot for them. Leading up to the expedition, he was able to ferry some diving equipment to the outer islands whenever a plane had spare cargo space.

The trip was joint-funded by the Cook Islands Tourist Board and Air Rarotonga. The population of the Cook Islands have slowly been moving away from the outer islands to Rarotonga. The aim of the trip was to assess the outer Islands for a cave diving tourist industry similar to the one in Mexico which would help support the people living on the outer islands. Bruce had done some preliminary diving prior to the trip and had identified three islands that could have potential: Mauke, Mitiaro and Atiu. We would spend one week on each island exploring, mapping, and collecting Stygofauna for identification. At the end of each week, we gave a presentation to each island's local community then a final combined presentation to the Tourist Board on our return to Rarotonga.

On flying into Rarotonga, we spent a couple of days buying food and sorting out the huge pile of six divers' diving gear. This included filling our Oxygen and Nitrox cylinders. Air Rarotonga had supplied us a plane but the enormous amount of equipment was too much for the cargo hold. To overcome this, we pulled all of the seats out, except the ones we needed to sit in, and strapped the heavy G size Helium and Oxygen cylinders, air compressors etc. to the cabin floor. Bruce borrowed a light plane and took us on a scenic flight around Rarotonga to view the impressive limestone peaks.

Our first destination was the island of Mauke. The island has a volcanic center ringed by fossilized coral reef called Makatea. It is covered in dense tropical rainforest. At times our island guides were required to blaze a trail for us through the jungle with bush knives (machetes) to relocate long-forgotten caves. The Makatea was equally demanding and on more than one occasion one would step on it only to have it break away, plunging your leg down a half metre deep hole. Not the best outcome whilst carrying dive cylinders through the jungle.

The work was exhausting. We explored, surveyed, then graded the cave systems all day, then I collected the data and drafted the maps late into the night.

Like most of the Cook Islands, there is a lens of freshwater under the island that sits on top of the saltwater that makes up most of the aquifer. The islanders were very



Vai Tango, Mauke.

interested in finding out the depth of this freshwater as it's their main source of drinking water, so we recorded the haloclines whereever we went. On Mauke and Atiu we found that most caves situated around the volcanic peak fringing land area started with brackish water then turned to saltwater at a depth of 3m. The caves higher up the volcanic peak still had a freshwater lens down to 10m before turning to saltwater. On Mitiaro as the highest point of the island is only 11m above sea level we found that the freshwater lens had been completely exhausted. All the caves we dived there started with brackish water turning to saltwater at a depth of 3m.

Some of the caves that we assessed on Mauke were Kopu Po'oki, Vai Tango, Vai Moraro, Vai Ou, Vai Tunamea, Vai O Rongo, Vai Ma'u, Vao o Paikea, Vai Moti, Vai Ma u, Vai O Rave and Vai Motu'anga.

Several caves were singled out as potential tourist sites, the others being too remote or else had safety concerns.

Via Tango is an outstanding underwater rift cave which descends on an angle of 55 degrees before starting to level out at a depth of 82m. We dived this cave on sidemount rebreathers using Trimix to a depth of 86m. The cave has some impressive decoration with a stunningly decorated large chamber extending from a depth of 40m to 60m. This large chamber not only has the best decoration I have ever seen underwater, the formations are also the deepest in depth I have recorded, being abundant throughout the cave to a depth of 60m.

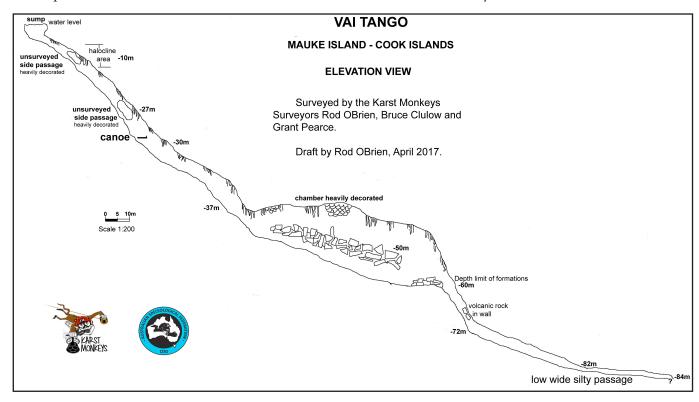
We were surprised to find a large canoe in the cave at a depth of 28m. I walked down to the harbour and inspected the fleet of canoes to get an idea of their construction method. Returning to the cave I shot some video of the sunken canoe then showed it to the village elders. This generated a lot of interest as after analyzing the footage they concluded that it was hundreds of years old due to its method of construction. We were asked if we could salvage it but after close inspection, I believed it was too fragile and would disintegrate when dried out. It was left in place for future divers' enjoyment.

Another cave that impressed me was Vai Moti. This cave was used by the islanders to hide in when the cannibals from Atiu paddled over to go head-hunting. The cave is mainly horizontal, reaching a maximum depth of 17m. It has a good-sized chamber that extends from a depth of 8m to 14m. This chamber is heavily decorated with speleothems.

Vai Tunamea is another horizontally running system with some impressive decoration. There are marine fossils in the walls and several air chambers.

Towards the end of the week, we organised a Hangi with the island villagers. They cooked an excellent pig. All of the left-over food was donated back to the village. One thing I noticed was that the main staple diet of all the island's pigs, chickens, cats and dogs was coconut which are over-abundant around the island.

Sunday on the island was church/rest day so we and our island guides could not work. However, they did grant us permission to have a dive at the harbour on Sunday afternoon. There is no fringing reef around Mauke and 100m off the island you are in 100m of water. Bruce and





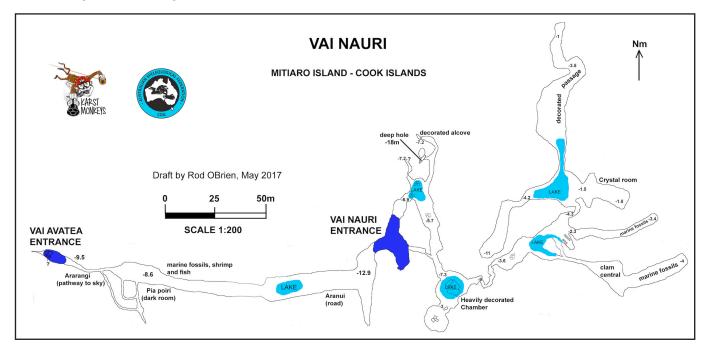
Vai Tunamea, Mauke.

I were accosted by several sharks as we swam out of the harbour. In the end we sat back to back on the seabed fending them off as they charged us for around 5 minutes. Really got the heart pumping. There were some nice patches of coral but it got too deep too fast for any serious coral reef to grow.

For week two we flew to the island of Mitiaro. This is where John and Franz left us and flew back to Rarotonga leaving just four divers. The whole island is a fossilized coral reef "Makatea" that has grown on top of a sunken volcano. The vegetation mainly consists of coconut palms and shrubby bushes. We stayed with the Northern Chief's daughter and were given the run of the island. It

was here that we were introduced to Cook Islands bush beer which seems to be consumed each afternoon. The freshwater problem on Mitiaro was more critical due to the island's low-lying nature. Their freshwater bore was pumping brackish saltwater. On a close inspection I found no freshwater left in the cave. Also, the cave under consideration for the new bore was found to be filled with brackish saltwater. A decision was made by the end of the week to install water tanks with a method of preventing the mosquitos from breeding in them.

Some of the caves we assessed were Vai o Song, Vai o Pei, Vai Uti, Vai Rua Ae, Vai Nanao, Vai Orotoma, Vai Marera, Vai Akari, Vai Inu, Vai Moo, Vai Turangi, Vai





Vai Nauri, Mitiaro.

Ika o te Uki, Vai Nauri, Vai Avatea, Vai Tamatoa, Vai Akaata, Via Rimapere, Vai Kopu o Karo, Vai Roa and Vai Pito o Kare.

At the time of our visit the Airport was getting an upgrade to handle larger aircraft. Mitiaro was hosting the Cook Islands games to choose their Olympians. The entrance to Vai Nanao had been covered over to expand the runway. The Northern Chief got the excavator driver to dig the cave entrance back up for us to include it in our survey. I can only assume it has now been filled back in.

Most of the caves we looked at on Mitiaro had underwater speleothems, marine fossils and Stygofauna.

The most spectacular cave was Vai Nauri where we laid over 1km of dive line. The islanders use the entrance lake of this cave as a swimming hole. It contained some very impressive speleothems with one particularly large chamber that had stalactites, shawls and flowstone all over the walls and stalagmites covering the floor. Marine fossils were falling out of the wall matrix in some passages and we identified a species of shrimp not previously known to exist in the Cook Islands. Following a passage westward we found that it connected to another cave called Vai Avatea.

Vai Ika o te Uki was the deepest cave we explored on Mitiaro. It is a fissure cave that was dived to a depth of 75m using Trimix and rebreathers.

Every night on Mitiaro was bush beer night with the Island Chief, his family and various local characters. I cannot properly express in words the friendliness of the Mitiaro islanders. They treated us like Gods. We even had the island's priest carrying our dive cylinders through the scrub. One of the highlights of the trip was attending his Sunday morning church service. They practically sang the roof off the church for us.

Week three found us flying to Atiu. The island of Atiu was once a volcano which sank leaving a high plateau surrounded by Makatea. It is covered in dense tropical rainforest. It is the only home of the cave dwelling Kopeka (a Swiftlet). The Kopeka builds its nest inside the cave and navigates by echo location.

By this stage we were getting used to the bush beer, Note: if that is ever possible, and Atiu had its fair share of watering holes.

Some of the caves visited were Vai Umurau, Vai Moroiri, Vai Nurau, Vai Akaruru, Vai Anatakitaki, Vai Tupuranga, Vai Piake, Vai Tapoto, Vai Tupukinoic, Via Ari, Pari Aniu (whistling holes), The Three Grottos, along with a variety of sea caves.

We found an underground streamway that carried the water from the swamps on top of the plateau, possibly connected to Via Moroiri, to the ocean near the harbour, a distance of two kilometres. This streamway connected several caves and dolines hidden in the rainforest along the way.

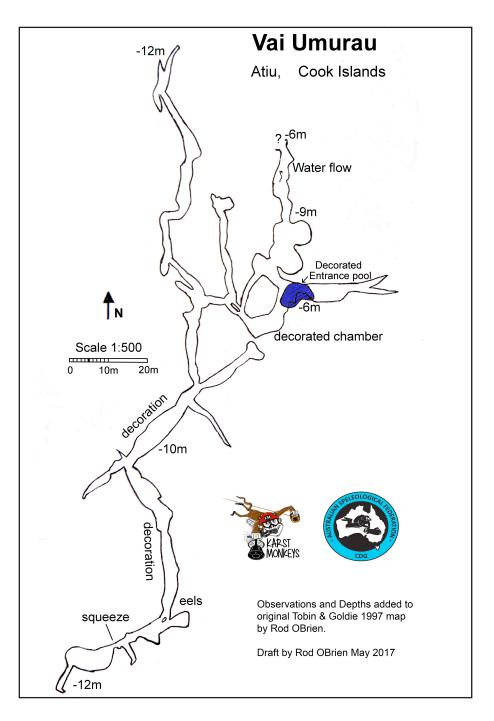
Another underground system flows from a sea cave Vai Piake into Lake Te Roto, a distance of 780m. At high tide saltwater species such as trevally swim up through the cave into the lake where they are caught by local fisherman.

Bruce and I were fortunate enough to be able to dive in Vai Tupukinojc, the home of the Kopeka. Our guide was the famous Birdman George who has the ability to whistle in all types of birds. This cave is normally inaccessible as it's a roosting cave for the endangered species. We found some significant underwater passage but due to time constraints we were unable to do any further work in the cave.

Perhaps the most significant cave dive we found on Atiu was in Vai Umurau. Paul Tobin and David

Goldie had dived and mapped the cave on a previous trip in 1997. We found the survey was good so we used their map as a blueprint and made corrections and additions as needed. This saved us a lot of in-water time not having to resurvey the entire cave. Vai Umurau has some excellent underwater decoration and several eels were spotted. The most significant discovery was detecting water flow at the end of one of the passages. The way on was too small to push through with our rebreathers but would be possible with a side-mounted pair of 7 litre cylinders.

At the end of week three we packed the plane again and flew back to Rarotonga. A full report was written and a presentation made to the Cook Islands Tourist Board.



I believe there is potential for organised cave diving trips to the islands of Mauke and Mitiaro. These two islands hold the majority of the better cave diving sites. The friendliness of these two islands' inhabitants was a highlight of the trip.

I would like to sincerely thank;

- Bruce Clulow for organising the expedition and for inviting me to participate.
- Ewen Smith, Managing Director of Air Rarotonga.
 This expedition simply would not have been possible without his support.

Wyanbene under water

12 - 13 November 2022

Phil Maynard

Participants: Lily Guo, Karl Tam, Bea Hadler, Rod Obrien, Alan Green, Phil Maynard, Júlia Fuentes, Allegra Melli, Peyton Sorenson



At the entrance, with plenty of leeches too. Photo Alan Green.

If you know Wyanbene Cave, you'll know that it's in a very pretty valley, with a grassy campsite just down the slope from the cave entrance. There's a car park, flat soft ground for the tents, a NPWS toilet, sunshine in the morning and lots of kangaroos for atmosphere. Basically it's paradise. So why weren't we camping anywhere near there? The problem lies back ten kilometres along the access road, where you have to cross the Shoalhaven River on a concrete causeway. In previous years it's been completely dry and upstream of the crossing was a waterhole for those hot summer days. In 2022, the causeway's been underwater for almost the entire year and a month before our trip it was 2 metres underwater. The forecast for our weekend was showers on Saturday turning to heavy rain on Sunday. So we weren't taking the risk of getting trapped on the eastern side of the causeway and we camped at Berlang, about 5km before the crossing.

On Saturday morning, there were showers following on from the rain of Friday night. We had two high-clearance vehicles and Lily's slightly dodgy car crossing the causeway, but there was 'only' 15cm of fast-flowing water to get through so we went for it. We hopped into the cave pretty quickly because there was a healthy crop of leeches at the entrance.

The first section of stream has decoration alongside the water. There's been trackmarking added since the last time I was in the cave and it looks to be doing the job of protecting the flowstone. We pushed ourselves through the gate (it's tight) and introduced our beginners to cave ladder technique to get down the other side back into the stream. The stream passage beyond the gate is some of the best cave in NSW, and everyone was enjoying the walking, crawling, scrambling, and general wetness of it all.

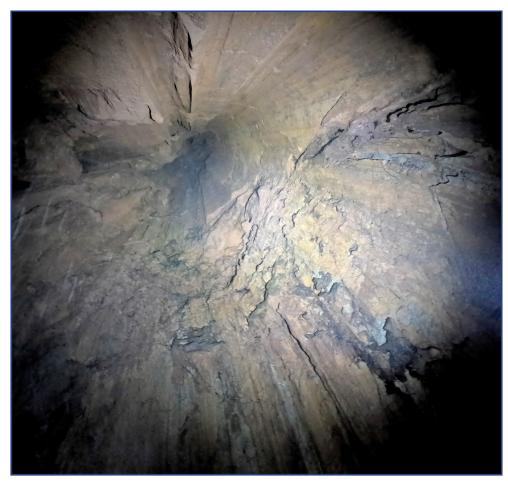
Gunbarrel Aven is measured as 110 metres high. It's normally got dripping water, and can turn into a crashing waterfall in wet conditions. You come into it from a low passage in boulders, with no hint of what you're about to break out into. Everyone was suitably impressed and then Alan turned on his crazy LED video light. I've never seen the roof of Gunbarrel before! Straight away, some things were obvious to see. Firstly, there's no trace of limestone in the roof, and one wall of the aven is not limestone approaching the roof. It's all a volcanic cap rock above the limestone. Secondly, the water enters from one side, underneath the cap rock. There was quite a bit of water falling down the aven, which made us start to wonder what the weather was doing outside. We also found a broken propeller blade from a DJI drone at the bottom of the Gunbarrel. Someone's been unsuccessfully trying to pilot a drone which definitely wasn't seeing any GPS signal.

The Gunbarrel was a suitable climax to the trip for our first-time cavers, so we had lunch in a nice warm dry spot and then turned around to get back out in case the weather was starting to threaten our trip back to the campsite. Along the way we took the side trip up into Helictite Chamber, which has also been track marked.

When we came out of the cave, everything in the forest was dripping wet. The ground downslope from the resurgence was flowing with water which hadn't been there before we entered. We hightailed it back across the causeway before it rose any further



Gunbarrel Aven with 20,000 lumens blasting upwards. Photo Lily Guo.



Looking up Gunbarrel Aven, 110 metres. Photo Lily Guo.

from where it was when we went in.

We were thinking about wading across the Shoalhaven at Berlang on Sunday morning to get access to Marble Arch caves. The campground at Berlang flooded at 7.30am from torrential rain. We weren't about to wade across the river in that, so we abandoned ship. This weekend was basically the final flood event of our three years of La Niña, so maybe we'll get back to Wyanbene in 2023 without the threat of imminent death hanging over us during the trip.

Special thanks to Alan and Rod for providing a gazebo shelter, cooking gear, and a hot shower for our camping on this very, very wet trip.

Borenore under water

1st - 2nd October 2022

Phil Maynard

Participants: Ian Cooper, Annie Martinez, Phil Maynard, Kevin Moore, Lily Guo, Helen Guo.



Borenore Arch. Photo Lily Guo.

On Saturday morning we had four cavers raring to go – Annie was not due to arrive until the afternoon and Lily's mum Helen was willing to do some introductory caving in the Arch.

At the reserve, the creek was flowing strongly. It's a big change from all the drought years leading up to the bush-fires in 2020. We are more used to seeing the creek as a trickle or no flow at all. The Arch had a gravel riffle near the upstream entrance that was fun to splash around in.

Our main objective this weekend was to begin surveying Cathedral Cave. It's extensive, beautifully decorated, and very, very wet in the current conditions. We split into two survey teams and the skinnier pair were designated to survey from the cave gate inwards, while the

larger-sized cavers surveyed from the gate out to the entrance.

The gate is on a very tight vertical squeeze. Armed with a key, I was ready to go in, but instead of a padlock there was a nice shiny scratch where bolt cutters had been used against the gate. Through the gate and down a bit of rockpile, the cave opens to a large decorated chamber. There was very active formation throughout, and fresh mud flows across the floor, and absolutely no fresh footprints or any sign of human activity. The cut-off lock is a bit strange given the lack of damage inside.

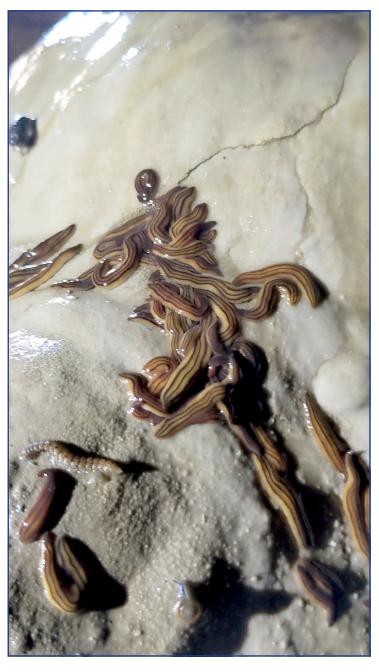
We surveyed the decorated chamber and up a slope to the way on. It's a tight flowstone rift going vertically down several metres. It was running with water down both walls and looked completely impossible to climb back up in those conditions. We left the survey at the entrance and went back to find the other survey team just getting out to the entrance.

On Sunday morning, Annie had joined us. We went down the valley to Tunnel Cave, but only went to the entrance cavern because the seasonal bat restriction was still in place. The formations in the entrance were really wet, actually running with water. I've never seen that happen in the entrance before. On one flowstone feature there were hundreds of flatworms plastered across the formation. They were a species I've never seen before (or since – in December we found zero flatworms in Tunnel Cave). Exiting the cave, we walked over the hill and down the valley an extra 700m or so to Verandah

Cave, also finding a rifty cave on the hillside we hadn't seen before.

Postscript: Later in October, a massive and very violent flood swept through the valley. Boree Creek was transformed – banks, vegetation, caves, everything. Tunnel Cave seems to have escaped the flooding, but the Arch and the National Parks path to it were severely scoured. The bridge over the creek on the walking track to the Arch was bent – it's 5m above the normal flow. In Cathedral Cave, there's a partial collapse of the tight rockpile below the gate. No-one's going in there for a while.

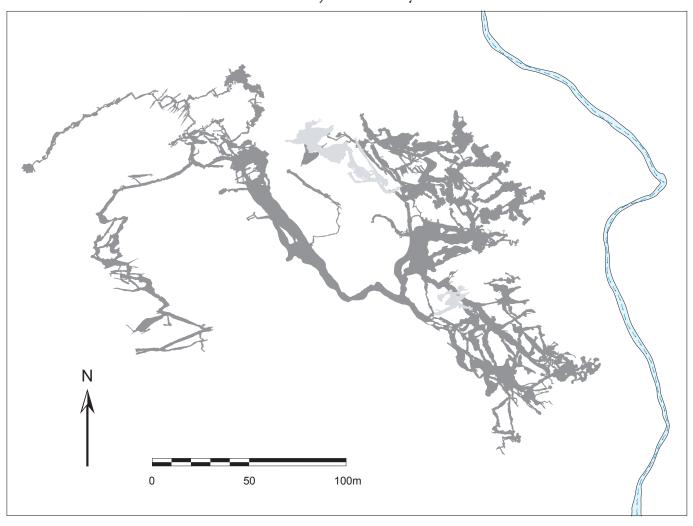
This flood event caused damage throughout the Lachlan valley and also caused the cave rescue exercise held that weekend at Bungonia to need to self-rescue out of Drum Cave.



Flatworms in Tunnel Cave. Photo Annie Martinez.

History of Wiburds Lake Cave, Jenolan

Mark Staraj and Phil Maynard



Wiburds Lake Cave. 2019 draft by Phil Maynard

Note from the editor: It's well past time that we published the maps and other information that SUSS has compiled on Wiburds Lake Cave at Jenolan. This history article covers speleo and non-speleo history of the cave up to 1995, the start of the modern survey.

Mark Staraj was cheerfully enthusiastic about all things Jenolan and played a significant role in the mapping project, as well as doing a deep dive into the various club journals to compile the history of the cave. Mark died in 2009 at far too young an age; his work on Wiburds Lake Cave was incomplete at the time. We've edited and serialised his final draft to publish it in sections over the next few SUSS Bulls, along with the completed maps of the cave.

The Legend

"Big Enough to Float a Battleship"

"The publicity attendant upon the first diving trip in '53 led to Fred Diggins of Kurrajong Heights contacting

the Society about an extensive cave upstream from the Mammoth Cave, which had been discovered in 1908. The cave entrance was in the foot of a prominent bluff on the western side of the creek, and the cave was said to be very extensive and to contain a large lake." Report of the Jenolan Sub-Committee 1954. S.U.S.S. Report No. 54. SUSS J. 3(1) Feb 1956 p10.

Caves and mysteries appear to be synonymous around the world and Jenolan Caves certainly has its fair share of them. One of the more intriguing and persistent of these is the legend of a cave containing a large lake that was discovered by James Caravoss ('Voss') Wiburd in 1908. He was at the time, Official Caretaker of the Caves, and his duties included exploring, developing and managing the caves on behalf of the Department of Mines. Rumour has it that he kept the location of this cave secret to spite his superiors who had begun to discourage his explorations. Instead he was expected to devote his time to supporting the increasing numbers of tourists and the income received by the Department

from the Caves. As an explorer born and bred Wiburd must have been chafing.

When cavers first heard of the "Lake Cave" in the early 1950s it was already too late to quiz Wiburd directly as he had died in 1942. Knowledge was fragmentary and accessible maps were mostly 40-50 years old. Much of the accumulated knowledge of nearly 80 years was never documented (apart from Oliver Trickett's maps and unpublished department reports) and reached the ears of caving clubs only as hearsay.

Today there exists at Jenolan a cave by the name of Wiburds Lake Cave (WLC). It seems simple – to the unfamiliar reader it's apparent that the cave of legend must have been found. Unfortunately that is not the case! It's true to say that the legendary "Lake Cave" *may* have been found. The best place to begin to unravel the confusion is to see what credence the legend itself may have. It is important to address whether there ever was a Wiburd's "Lake Cave" at all. So, who was Wiburd?

Wiburd has long been touted as the doyen of all Jenolan cave explorers. His discoveries in 1903/04 of Pool of Cerberus (originally Skeleton Cave), River and Orient Caves, and Temple of Baal are probably the most famous and admired of any of the finds made at Jenolan in all of its 150 years of exploration. Wiburd first began caving at Jenolan in 1885 under the tutelage of Jeremiah Wilson. Wilson was the first appointed Caretaker of the caves, a role that Wiburd would assume himself in 1903. Wilson's contribution is almost as famous as Wiburd's and both had an insatiable appetite for cave exploration. The 10 years spent caving in Wilson's company must have been invaluable to Wiburd. There could have been no better way to glean the accumulated knowledge of the first 40 years of exploration.

Wiburd's own appetite for new discoveries didn't just rest with the information gained from others. Numerous signatures of Wiburd (often the famous "Voss Wiburd") have been found the breadth of Jenolan in caves large and small. It is a certainty that before long Wiburd would have had the most comprehensive and intimate knowledge of Jenolan of any explorer before or since. His stay at Jenolan eventually spanned 47 years. It would be safe to say that if any such "Lake Cave" had been found during his tenure then he would have known of it, almost certainly would have visited it, and most likely would have had a hand in its discovery.

In the 1940s cavers began to ask the questions but they did not know to ask about a "Lake Cave" and nobody then present at Jenolan could have given them an

answer. So where were these people who could confirm or deny the legend? Who were they? No one knew.

In 1952/53 SUSS began to explore the upstream sump of the JUR in Imperial Cave. This was before SCUBA became available and the exploit received much local publicity. A report in the Sydney Morning Herald about the diving attracted the attention of a Fred Diggins, then living in Kurrajong Heights. He contacted the club to mention that he had in 1908 seen a cave at Jenolan in the company of Wiburd that had a lake "big enough to float a battleship", and was the club interested?!

At least one search was made in the company of Diggins to find the lost cave. It had no success whatsoever. Some searching did reveal some other caves, one of which later became known as Diggins Diggins Cave and is today a part of the Serpentine System [Burke 1956]. Diggins also passed on a description of the cave and its location. Henry Shannon (SUSS & UQSS), who was involved in early explorations of Wiburds Lake Cave, put together the following attempt at clarifying the events that occurred between the first search with Diggins in 1954 and the discovery of Wiburds Lake Cave in 1963.

"Diggins' story, in brief was that many years ago he, among others, had been taken on a trip to this lake by Wiburd, and the lake was enormous, "big enough to float a battleship". The cave was quite a long way up McKeowns Creek. The entrance was near a point where there was a big rock on one bank of the creek, with an old creek channel on the other side of it. The entrance was at the edge of the flat, not far up hill, in a nettle patch (the rock was detached some distance from the hill slope). The enormous lake was not far inside the cave, and was only some 15' or so below creek level." [Shannon 1964].

In 1959 SSS received a tip off from the Chief Guide, Frank Harmon who [anon. 1959a]: "...mentioned he had another independent report on 'Diggins Hole' placing the position around McKeown Flat [now Serpentine Flat]. Excavations of two likely places will be carried out in the near future." A follow up trip in May 1959 failed to report any findings [anon. 1959b].

[Shannon 1964 cont.]: "As far as I know, nothing happened north of the Serpentine until my 1960 hydrology trip [Shannon 1961] although Dave Jordan and Warren Peck had investigated the geology in that year and also later. (My trip was in December). It had been raining for days but I investigated the low level entrance near the big rock in the creek, and some other entrances also at a low level near the very end of the limestone; the entrance near the rock was blocked though diggable. I gained the impression that the area was very promising"

By January 1963 SSS were looking in earnest "... in the last north western outcrop, only a few hundred yards from the old farm house... trying to locate caves for the large Jenolan map ... On the Saturday Ben [Nurse] and Mary [Gaudron] located a further entrance J58 ... Entrance was gained by chipping at cracked rock. On the Sunday the rest of the party further explored J58 which is a cave of considerable magnitude and has never before been entered... The cave also has a fairly large running river.... On the Sunday another entrance which may link into with J58 was also located." [anon. 1963a].

They were definitely in the right place. But they had come at the worst time (wet!). Without the stream they could have followed the strong breeze all the way into Lake Chamber.

The lake was eventually found in May 1963 via the J92 entrance by John Foster: "The cave was discovered by John Foster in the company of his friends from Penrith, the four of them involved in all the Sydney societies (I think one is UNSWSS only, one UNSWSS who is also a SUSS prospective, and one SSS). The next week John took in an SSS party, and the next week (?) a SUSS party... The only discrepancy of note remaining in Diggins' description is that the entrance is not almost on the flat, near the rock, and in a nettle patch, but at the foot of a tall bluff some fifty feet up the hill. Could it be that Diggins' party went in by a lower entrance, the one near the rock, and that this was later blocked up?" [Shannon 1964].

Not to scale.

J101 J92

ENTRANCES

Yawning Gulches
No. 1

EROF

EXTENSION

CAWATER

LAKE

Chamber

LAKE

LAKE

LAKE

LAKE

Chamber

Discovery sketch by John Foster, 1963.

So by 1963 the legend had been established as true and the lost cave had been found. Case closed. Or was it? By 1964 it was no longer certain. The lake found by Foster, for which the cave got its name, had disappeared entirely! It is now well known that the lake in Lake Chamber is rarely present, only appearing after flood during very wet periods, and never persisting for long (at most months). Furthermore, while the lake is impressive (when there) by Jenolan standards it is a huge distortion of the truth to suggest it could float a battleship. Even the passage of time, exaggeration, and poor illumination could not account for such a description.

There were other stumbling blocks. No one had found a signature of Wiburd or anyone else anywhere in the cave. Finally there were problems with Diggins' descriptions. The presence of a large rock and a stream gully and a lake neither far into the cave nor deep below the surface all tally well with Wiburds Bluff and Wiburds Lake Cave. Also, there are entrances at creek level. But, and this is a big 'but', none of these creek-level entrances are enterable as far as the Lake Chamber when the lake is present. They are sumped. Or they provide no passable connection into the cave proper. The entrance found by Foster and in fact all of the entrances that could possibly lead to anything that is describable as a lake are all located some distance up the hillside and nowhere near the river flat.

In 1995 there came a surprise. Signatures were found in the J92 entrance passage! This is the passage found by

Foster and is the main route to Lake Chamber. The signatures do not belong to Wiburd but to two others and were dated 1915. It certainly supports the notion the cave was known around the time Diggins claimed to have visited it. Unfortunately nothing is yet known of the two visitors despite leaving us their names: "E Nathan" and "Tom Pennington".

A further and more cryptic clue was found 6 months later. A possible Wiburd inscription was found in the J58 entrance route, not far from where it connects to Lake Chamber. This is the only route to Lake Chamber from an entrance on the flat and was impassable to SSS in 1963 due to a running stream. No other trace of words or a date is visible. If the signature turns out to be authentic then it is an intriguing piece of the



Possible Wiburd signature, J58. Photo Sasa Kennedy

puzzle as it verifies Diggins description of the entrance location (J58 or its neighbours) almost perfectly and pinpoints Wiburd as having been there.

Plumbing the lower levels

1963-66, the Henry Shannon Survey.

Exploration pushed forward as the water levels receded. June 1963: "Its whole extent was explored by rubber dinghy and the most promising possibility for further exploration would appear to be by diving." [anon 1963b].

The July 1963 trip took advantage of the shallow lake and found it made "investigation of the siphon possible, and the passage was followed until water filtering from a low sandy passage, prevented any further progress. A very strong draught was observed." [anon 1963c].

In August the "lake had virtually disappeared, leaving a flowing stream which would be difficult to reach because of the slippery mud slope leading to it." [Lotz 1963]. So it appears this first opportunity to explore downstream of the Lake was missed. Although it's inevitable that exploration occurred soon afterwards the first details of what was to be found there did not appear until after January 1965 when Henry Shannon began publishing his own explorations.

Initially, the bulk of WLC was again sealed off by the lake in Lake Chamber. The upper levels, consisting of The Maze and other branching passages off Fiveways were the only accessible parts of the cave. Shannon's party on December 30 1963 [Shannon 1964] spent most of their visit exploring The Maze. This revealed a short pitch requiring a ladder. Not having one at hand it was left until another trip. This pitch was in fact the entry point to the only restricted area in WLC – a well-decorated and fragile passage called Silverfrost.

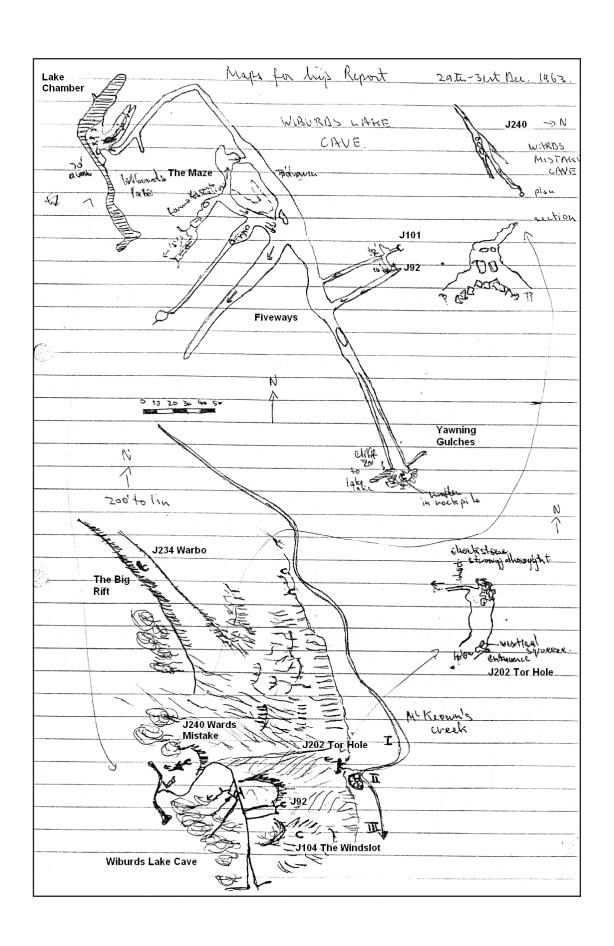
Off Fiveways one passage was followed to the deep drop known as Yawning Gulches No.2. At this time the pit dropped into deep water, since it is in fact below the downstream end of the lake in Lake Chamber. Nearby was found a small rockpile stream, one of two that enter WLC at its southern end.

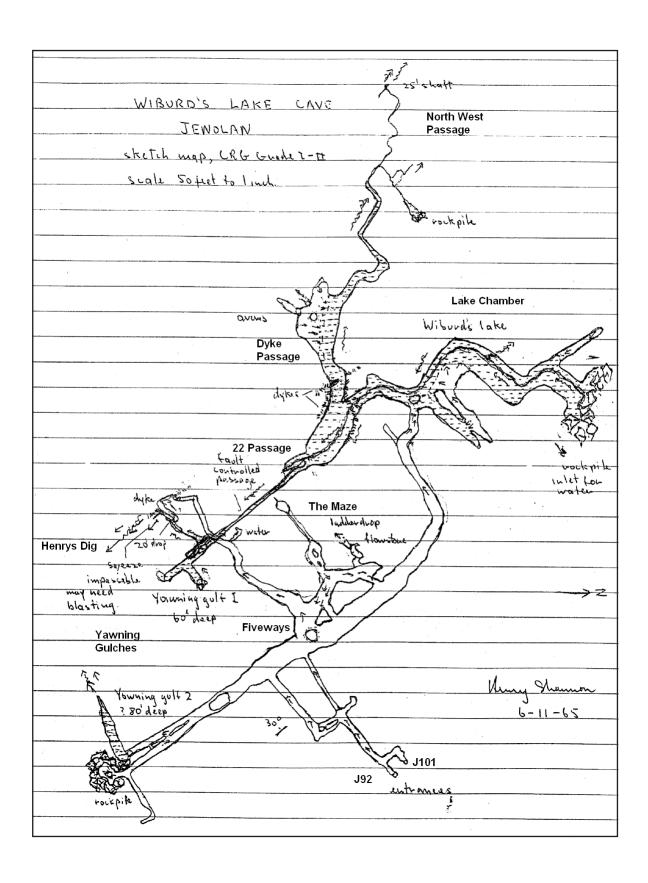
During 1964 rainfall eased at Jenolan and the lake receded to its usual level – non-existent! This revealed three major passages. 22 Passage is a low conduit draining Lake Chamber to the south. Dyke Passage is a large walk-through tunnel bearing north-west and also downstream of Lake Chamber. Finally, the remainder of Lake Chamber itself, also large walk-through passage leading north-east and upstream to where it reaches a big rockpile.

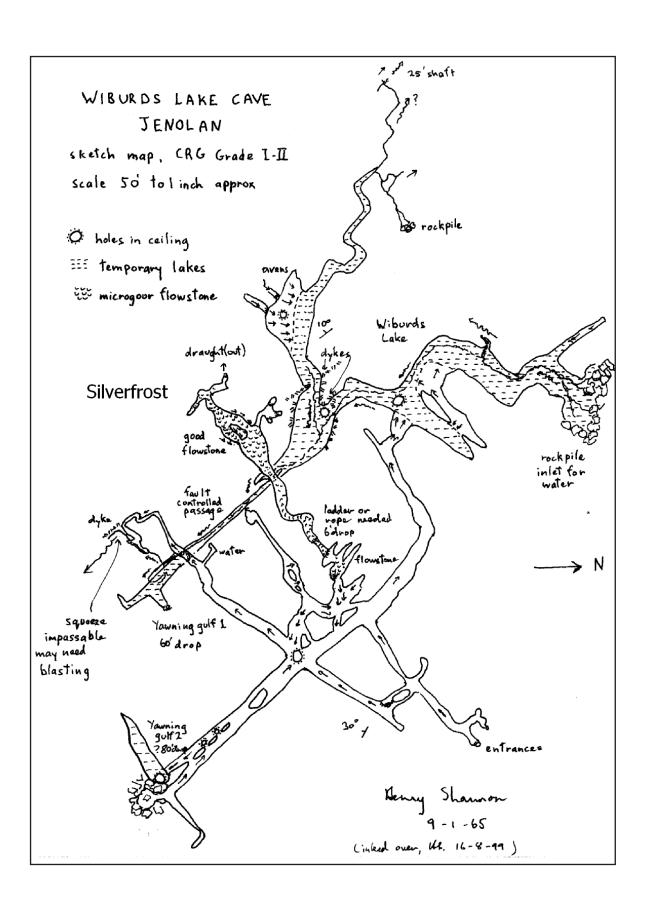
Shannon's next visit was on January 2 1965 [Shannon 1965a] and by this stage footprints showed him that Dyke Passage already had been explored to where it dramatically shrank into a hands-and-knees crawlway, still bearing north-west and plunging steadily deeper. It is likely that this section was still underwater when Dyke Passage was first explored. Shannon continued the exploration of North West Passage. It zigzags frequently with many side branches, and in the main is a wet and muddy crawlway. Shannon eventually reached a 25 foot deep pit which he declined to enter without a ladder. The base of the pit contains a low stream passage and is impassable due to blockage by mud. This pit was the end point of North West Passage until the North West Front was found in 2009.

Most of the side passages from North West Passage are short and blind. Shannon picked out one to the east (marked out by sand and stream gravels) and investigated it as far as a rockpile and a constricted muddy crawl. Neither was pushed on this trip. The rockpile was later (1984) penetrated by SSS to a significant dry stream passage draining from East to West during floods.

Shannon made only a cursory visit into 22 Passage and after only a short distance retreated from where the streamway disappeared into a low gravel choke. The continuation up a mud chute to the left was noted but







not looked at. In the other direction the rockpile at the end of Lake Chamber was briefly inspected. On the way out, Fiveways was further looked at and a passage was explored to a steep muddy pitch off the left-hand wall, back down into water. The passage itself went on some distance but was not pushed and there was another branching passage to the right. All possibilities looked promising but the pitch exceptionally so. Intriguingly Shannon reports noting "some old inscriptions in the mud but I could not read them". These have since been lost.

At the end of the month Shannon was back [Shannon 1965b]. The inviting pitch to water was the objective but it was approached with a rope rather than the preferred ladder. To find a better option Shannon's group first explored onwards down the passage to where a particularly muddy downclimb marked the way on. It was decided that the pitch was the safest bet after all so he and Michael Graham proceeded to belay each other down.

A ledge broke the drop some 5m below. Back underneath a short passage led to a drop into another passage at a still lower level again. The lower tunnel is in fact the downstream end of 22 Passage but was not descended into at the time. Instead they returned to the ledge and saw that it skirted around the wall of a chamber, some metres off the floor. The descent was continued to yet another ledge. This last was a 5m cliff and so a low tunnel was investigated in preference. This was in fact the end point of 22 Passage. However they did not reach the point they had seen from above a few minutes before because it forked.

More interested in the evident downstream branch, this was squeezed and dug "...into a muddy cleft which looked familiar, but we went on and dug out the next squeeze. The cave appeared to end but continued through the floor. When I was through I realised that I had passed through a dyke (probably of basalt) from this point the water follows a squeeze running along the strike of the basalt. We removed a few awkward rocks but then decided not to go on because we were getting too cold. (The basalt ceiling of the squeeze is jointed and does not look good)." [Shannon 1965b] This spot is now known as Henrys Dig. Shannon later traced 22 Passage from Lake Chamber through to its end at Yawning Gulches No 1 [1965c].

On a UQSS trip on December 31 1965 Shannon finally returned to the undescended pitch found in The Maze two years earlier. They discovered a well-decorated and fragile passage subsequently named Silverfrost: "From this point to the end of the extension the floor is of flow-

stone, of quite good quality, fairly small crystal faces but with a rather disappointing silver grey colour. It is eminently worthy of the strictest rules for preservation." [Shannon 1966]. The grey discolouration of the otherwise creamy coloured flowstone and a breeze from a tight hole at its end pointed strongly to a nearby surface connection. At the time of writing no further progress has yet been made although the present survey indicates a possible connection with the BMSC Entrance, but no prospects for further cave.

Go West!

Scaling the upper levels: 1971-76, the Jim Seabrook Survey.

A thorough survey of WLC began in 1971 by SUSS under the direction of Jim Seabrook. By July 1971 Seabrook reported [1971a]: "The cave is much more extensive than previously thought, the E-W distance being in the order of 1800ft. In all over 3000ft of passage was mapped with some still remaining to be done."

By May 1972 the SUSS President stated in his report that over 5600ft was now surveyed [Dunkley 1972]. And in 1975: "About 80% of Wiburds has been drawn up to Grade 6. The rest requires surveying in the more remote locations and constricted areas. Undoubtedly more cave will be found before this is finished. This project is progressing as lake levels permit." [King 1975a]. This survey was never completed.

It was probably doomed from the start. May 9 1971: "On Sunday John H. [Holliday], Jim [Seabrook], Jeff [Turner] and David [Cook] went to Wiburd's with a view to commencing the planned high grade survey. However, the trip turned out to be a reconnaissance of the river system below the lake region, and eventually there was no time left for surveying. Much to my surprise I found that the 'river' trended much more east-west than previously thought. The western branch or upstream direction of the river goes much further west than expected. This section had not been entered since the last flooding and I suspect that we were the first in the cave since that time." [Seabrook et al 1971]

Seabrook was more right than he could possibly have known. The lack of any sign of previous entry had nothing at all to do with recent floods. It would have, had they been exploring in the North West Passage as he believed. The truth was much more interesting! Instead of worming into the uninspiring looking hole that signalled the start of North West Passage they had scaled the preceding tall mud bank on the right hand side. No doubt they were looking for more of the same easy walking they had enjoyed throughout Lake Chamber and Dyke Passage. Out of sight of Dyke Passage, past



Jill Rowling and Megan Pyke in Neddy's Knock. Photo Alan Pryke.



Aragonite in Neddy's Knock. Photo Alan Pryke.

the "Push-me, Pull-you Squeeze" where the mud slope almost meets the roof, they found it.

The Brown Room is a spacious cavern floored in thick mud and boulders, which was named during the current survey. In the left corner a deep muddy pit would later in September 1971 be proven to connect back into the start of North West Passage [Seabrook 1971b]. An offshoot on the right leads to a promising aven that would require climbing aids. Instead they pushed dead ahead up a short but slippery mud slope and discovered Western Passage. This immediately became an easy walk-through tunnel running for some 300m by twists and turns. They quickly reached the end, being slowed up only briefly at the one or two places where cave-ins turned the passage into a low squeeze between boulders. Close to the end a couple of excellent-looking dig sites were noted and elsewhere a number of low side leads.

The survey did finally kick off in July and resulted in the bagging of almost a kilometre in just one weekend! A spate of new finds had begun. Discoveries seemed to occur just about every month throughout the remainder of 1971 and were often surveyed the same weekend. The major passages in River Section were surveyed in September, and revealed much more of the hydrology than was previously known [Turner, 1971].

In July a peek up the first side tunnel in Western Passage found one of the most photographed sections of WLC: "It is a 15' wide, 70' high rift with a rockpile occupying the lower 2/3rds. There are several clusters of 3" long aragonite crystals plus other formations..." [Seabrook 1971a]. This section is obviously delicate and great care is required. Just how much so was discovered by Seabrook in August when he named it Neddys Knock: "The chamber was then named when a rock upon which I was standing decided to move 4' vertically down taking me with it." [Seabrook 1971c]. Together with offshoots Neddys Knock added almost 100m to the cave length.

Seabrook and a support team launched a scaling pole assault at Dyke Passage on September 25 1971. All that was needed now was to set them up ... "This involved cutting steps up a mudslope with a g-pick and hauling up the pole. The g-pick was used as a base to prevent the pole sinking into the mud. A rope was taken from the bottom of the pole to a piton for further support, and another rope from the top of the pole to a 'bong' in a crack 10' up. The pole with ladder attached was hauled into position so that it rested diagonally with its top on a mudslope 18' up. With Colin belaying I climbed the ladder leaving a runner on the top rung. I then cut two steps in the slope before I began to run out of mud. I was about to place a knife blade with etrier in a con-

venient crack when the mud holding me up collapsed. I was almost emasculated on one of the pole's bolts when Col stopped my fall." [Seabrook 1971b]. Undeterred, a second attempt also resulted in a fall, also luckily without mishap.

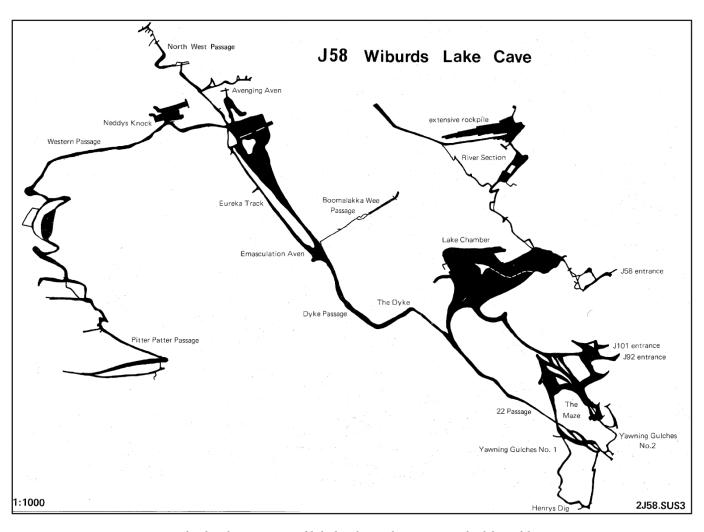
Wiser for the experience, Seabrook rejoined the attack on Emasculation Aven over a year later on the now famous Nibicon Trips of January 1973. The Ninth Biennial Conference of the Australian Speleological Fed eration (Nibicon) centred on Jenolan Caves with over a week of field trips. In exploration terms it would be one of the most successful ever held. Cavers from the breadth of Australian clubs combined to team up with the local experts.

On January 1 1973, Emasculation Aven was conquered without incident by scaling poles [Seabrook 1973a] to discover the Eureka Track. At the top a spacious tunnel realised just over 100m of passage including a couple of minor side bits. Some excellent aragonite crystals were also found here. Unfortunately Eureka Track represents only a truncated section of main tunnel, ending further to the north at a pitch that connects a pit in the Brown Room above to the start of North West Passage below. There are no more prospects here.

An obvious continuation of Eureka Track was seen to the south from high up on the opposite (east) wall and was the objective for the following day. Swinging the poles across proved impractical with the amount of bend produced in the pole [Seabrook 1973b]. It would have proved futile. In 2008 with the benefit of modern bright LED headlamps it was possible to see that this lead in fact choked [Cooper 2008].

An intensive trip over Easter 1975 brought "Ken's Curious Cavern" to the attention of SUSS members. Exploring a separate offshoot of the upper level a series of zigzagging narrow rifts encrusted in moon milk and cave coral led downwards to the head of a pitch. A survey tape was lowered through the hole and showed it to be a respectable 23m deep and blowing a breeze. A return was made with a rope and the pitch descended "... and after climbing down through a rockpile at the bottom, emerged in what was later confirmed to be 22 Passage in Wiburds. Thus there is now a new entrance to Wiburds." [King 1975b]. A joint trip in May eventuated with BMSC and subsequently confirmed their earlier discovery of the upper cave but the pitch was a new find by SUSS [King 1975c].

On March 31 1975 Seabrook returned with Welch and the scaling poles were finally hauled back into Lake Chamber [Welch 1975a] "... and pushed ... into holes



Wiburds Lake Cave, map published in the Northern Limestone book by Welch

in the roof... One hole led to the discovery of a large section of cave ... The new section led to a large rockfall area which is heading towards the rockpile area above River Section." This was a significant new find. Recent surveying has revealed almost 370m of passage in the Upper Lake Chamber. As with The Big Rift and Warbo Cave above, and the nearby upper parts of River Section, there is extensive evidence of rock shearing and faulting. A flowstone against one wall is so broken up that it appears as though a careless caver had knocked it over and then hastily stacked the pieces together.

On June 11th 1977 a team climbed the rope left dangling by Seabrook and started the survey: "Part of this extension proved to be quite unstable, since an extensive shear zone has produced large rockpile which seemed hopeless to survey. A few hours were spent in this region geomorphologising and rearranging the furniture. This section of cave is heading towards Warbo Cave and a connection could be possible if one was foolish enough to try. Marble is commonly found in the rockpile and would be the result of contact metamorphism by dykes in the area. Other low grade metamorphic rocks exhibiting strong cleavage were also extensively found. The

remaining parts of the extension revealed some quite reasonable formation." [Innes 1977b].

By 1975 the J227 entrance had been tagged and described thus [Nurse 1976]: "... is about ten metres long overall, with a small bit dug out by S.U.S.S/B.M.S.C. at bottom to gain a further three metres ... This is the lower entrance of a cave about 10 metres long, with two daylight holes ... five metres above. These were not considered worth tagging". One of those entrances "... is about four metres above ... (J227) behind the apex of a rock. This is the easier to enter." This is the entrance now tagged J320. Presumably at some point in the next year and before the publication of the Jenolan Northern Limestone book a connection was made between WLC and J227. It seems strange that the strong breeze associated with this entrance did not rate a mention. There was no published report or evidence in the cave to show any exploration into the extensive areas between these entrances and River Section.

By 1976 a silhouette map was ready for inclusion in the Jenolan Northern Limestone book [Welch 1976] and a rounded estimate of 2km was provided. This is only some 200m more than the reported length of 5600ft

given 4 years earlier. The resulting map did show the full extent of the cave, just not its entirety nor its true complexity. The proposed elevation view was never drawn up.

The Wash-up

From the Blue Book to the new survey, 1976 – 1995.

Subsequent to the publication of the Northern Limestone book, activity in Wiburds dropped off for a few years. This was a period of extended and severe drought at Jenolan, lasting through until 1983. Much of the cave dried out and was easily accessible.

A detailed survey and map of Boomalakka Wee was published in 1977, proving the ability of cavers to ignore sanity considerations: "So on this Saturday morning we headed off with trusty Suunto, tape, string, cyalume, and with electrical light firmly clenched between one's teeth;

disappeared underground... John squeezed ahead holding one end of 15' of string. To the other end of this was tied the fibreglass tape and a cyalume. When his feet disappeared out of sight he stopped and pulled in his end of the string until I could get a good sight onto the cyalume. At this stage I could take a bearing and a distance easily and record the data. After this I would squeeze up to the cyalume which acted as the survey station, and once again the process was repeated with John moving on ahead." [Innes 1977].

SSS found a streamway extension in North West Passage in 1984, pushing through rockpile at both ends to show the trend of drainage from River Section towards the bottom of North West Passage: "A well trodden side passage, heading eastwards, brought us to a constriction with obvious digging potential. The trip leader began scratching at it with fingers and stone scrapers. Then Steve Babka moved in with his yellow steel-capped earth moving gumboots.

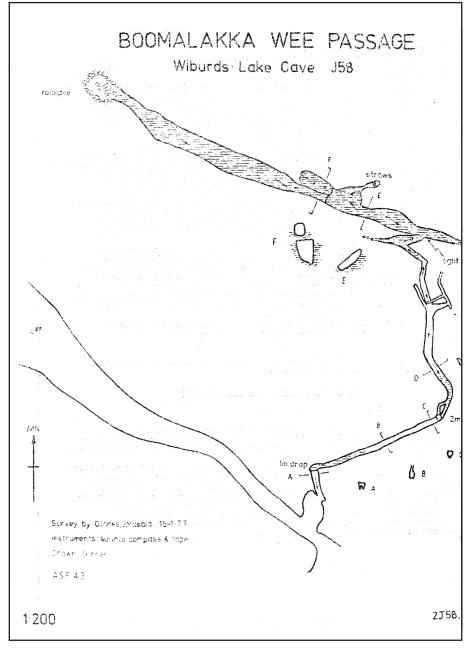
"After 20 minutes of kicking the soil through the other side we gained access to a small chamber at the same level as the preceding passage. From here a short, tight hole through broken rock dropped us into a larger and lower passage." [Bonwick 1984].

By 1987, drought had been replaced by endless rain. The choked phreatic tubes (Sandtraps 1 and 2) at the end of Western Passage were pushed by SUSS in 1987, but to no avail [Scott 1987].

Subsequently, activity in and around Wiburds began to accelerate when the rain stopped, and SUSS began the modern survey project in April 1995.

Acknowledgments and Dedication

This work would not ever have begun if the kilometres of mapping, plotting and drafting had never completed. For this significant milestone I must thank the thoroughly professional efforts and dedication of Ian Cooper. Significant, I say, but not only because of the tremendous



amount of work involved or because of the completely satisfying results, but because he has succeeded where at least two previous attempts had foundered. Heartfelt congratulations from the caving community!

Many are the cast on such a large project and principal figures deserving of mention but in no particular order are Jill Rowling and Mike Lake for mapping and drafting Silverfrost and The Maze; David Jackson for massive amounts of surface work and the exploration of Warbo cave; Phil Maynard for much of the map drafting (some of it more than once!); Henry Shannon for access to his copious notes on early exploration; and Ross Ellis and the Sydney Speleological Society for material from their library.

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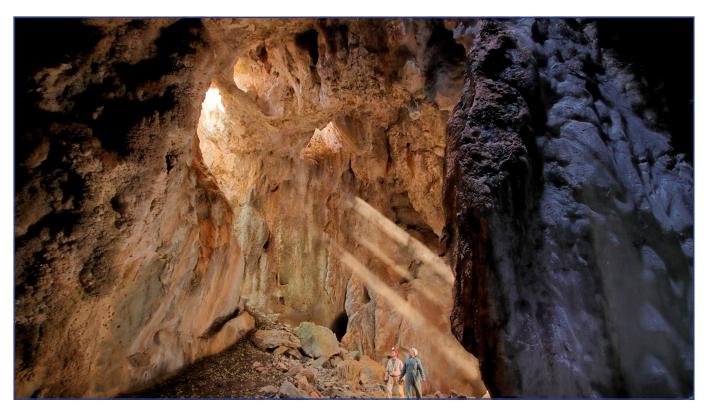
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Photo Gallery



Alan Pryke and Phil Maynard in Castle Cave, Chillagoe. Photo Rod OBrien.



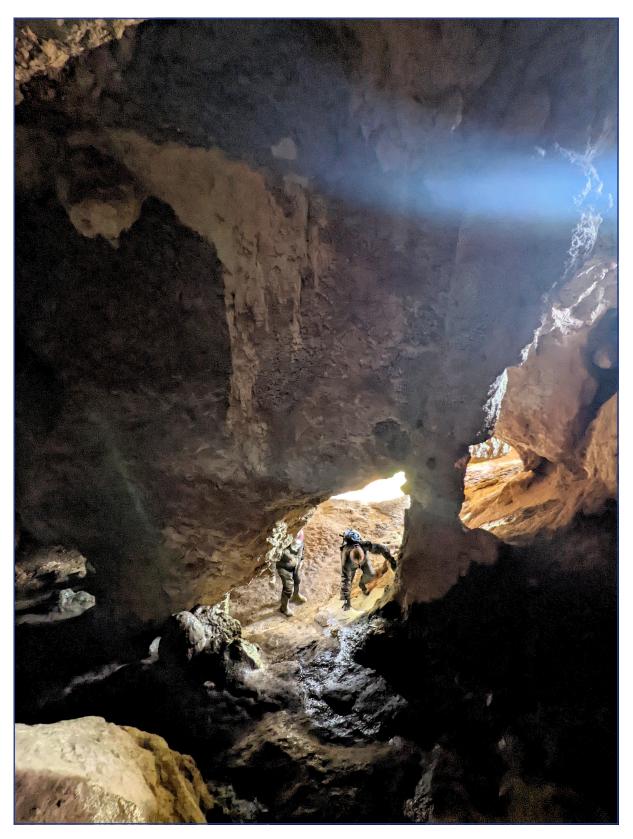
Vai Umauru sump, Atiu island. Photo Rod Obrien.

Photo Gallery



Sea cave, Atiu island. Photo Rod Obrien.

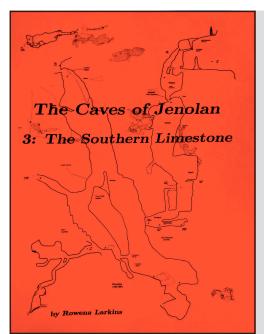
Photo Gallery



 $Entrance\ of\ Tunnel\ Cave,\ Borenore.\ \ Photo\ Annie\ Martinez.$

Things to buy

For postage and handling costs and the details of how to order go to http://suss.caves.org.au/publications. There you will also find a range of must-have maps and other publications.



The Caves Of Jenolan 3: The Southern Limestone

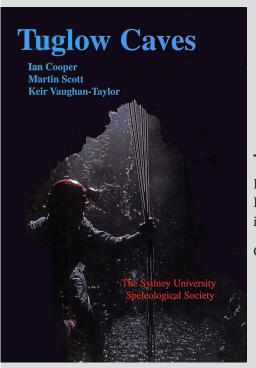
Just published!! By Rowena Larkins. 2020. 90 pages. Contains maps and descriptions of every known cave in the Southern Limestone of Jenolan plus notes on the geology and hydrology of the area.

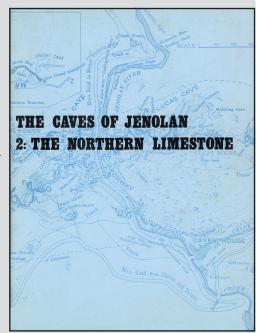
Price is \$20.00 + PH.

The Caves Of Jenolan 2: The Northern Limestone

Edited by Bruce R. Welch. 1976, 140 pages. We still have some copies of these books left. Contains maps and descriptions of many caves in the Northern Limestone section of Jenolan plus notes on the history of Jenolan and its geology, geomorphology and hydrology.

Cost is \$8 for members and \$10 for non-members + PH.





Tuglow Caves

By Ian Cooper, Martin Scott and Keir Vaughan-Taylor. 1998, 70 pages. Examines caving procedures, site descriptions, history, biology, surveying and maps, geology and hydrology of Tuglow Cave and others.

Cost is \$13 for members and \$16 for non-members + PH.

Back Cover: Queenslander Cave, Chillagoe

Photo Rod Obrien

