Jenolan Update 2 Barralong and the Missing Link

Keir Vaughan-Taylor SUSS

T^{HIS IS a condensed account over many trips.}

For those unfamiliar with Jenolan, there are three main rivers that converge from the north, the south and the west in the Grand Arch, a large chamber through which tourist buses and through traffic pass every day. About 250,000 people visit Ienolan each year. The northern (Jenolan Underground River) and southern (Styx/Lethe rivers) are underground but the western river flowed above ground in the past, sinking just prior \cong to the Grand Arch, perhaps joining into § the Jenolan Underground River, perhaps in Chifley Cave somewhere. Something to be looking at. Now the western river runs through a concrete drain straight into Blue Lake. The Grand Arch, I conjecture, may be the result of corrosion mixing from these chemically different water courses, but of course it is all fairly complicated.

The river from the south exits at Blue Lake and was thought to be seen in Lucas and River Caves. The waters we see in Lucas and River Caves' Pool of Reflections are now known to be anabranches of the Stvx/ Lethe river but taking water from what is possibly another smaller river lying under the giant Lucas Cavern. In the tourist caves the only true part of the Styx River is seen at Twin Bridges, a section of river notably where historic guide J C Wiburd was photographed, standing a little stooped with his cane and looking uncomfortable with the photograph. This is an iconic section of cave, and an admirable place to be photographed.

Under the spectacular chamber in Lucas is a group of muddy passages known as the Mud Tunnels. In one place there is a drop to water, the Lethe Hole. Pools on each side of a narrow gravel floor are, it turns out, the only true body of the Styx/Lethe river seen in the tourist caves.

This part of the water was called Lethe in line with the rivers-of-hell theme and sonamed before being recognised as the main underground river and exiting as the Styx into Blue Lake. From the tourist pathway,



Katrina Badiola searching for the Missing Link during the flood

to the right it passes through a spectacular dive, then a passage known as the Long Low Horrible Flat Thing to emerge at Twin Bridges and then on to Cerberus Pool before finally emerging into the outside world at Blue Lake. What a dive—it's a classic that needs to be on the 'Been There, Done That' T-shirt.

Over the years SUSS explored and mapped the river from Lethe's start all the way through to Blue Lake. It took years of work, largely by Greg Ryan and me, to survey the route finally rendered in map form by the great SUSS cartographer Philip Maynard.

In the other direction from Lethe Hole we know the water connects to Barralong. When Barralong was discovered in the 1960s by Jenolan guides it doubled the southern reach of Jenolan Caves. The most northerly end was found to end in an overflowing lake dived in the 1970s by Peter Rogers and later many times by SUSS.

We knew nothing about what was between Lethe Hole and the furthest reaches of Barralong to the south, other than that they are connected. In reviewing the dive south, recall that the dive begins in the backmost lake, descending through a hole in the bottom of a lake. The downward passage received up-flowing water and tends to push granular pebbles and deposit them on the upward slope as it rises into the Barralong Lake. On one trip Michael Collins and I spent an entire dive with no objective other than to scoop the pebbles off into the sides and out of the way in an attempt to make the southern passage navigable. It was highly successful, turning a difficult squeeze passage into a highway.

The onward passage makes its path though a number of jointed rifts, passing under a rift slot. The top of the slot is a tunnel, accessible to any wet and bedraggled caver after climbing a muddy cliff on the far side after swimming across the Barralong Lake and climbing the impossible cliff on the other side. Somehow, someone in the past did it and left an ancient metal ladder. At one time we climbed the ladder and started our dives at the slot. All too hard, really.

The dive onwards from the slot zigzags through keyhole tube obstacles negotiated by turning from one side to the other and sliding side-mounted tanks one way and then the other through each impediment; these are not really squeezes, but nevertheless they slow you down a bit. The keyholeshaped tunnels are at about 4 m depth, occasionally surfacing in small airbells. The shallow passages descend suddenly to

JENOLAN UPDATE 2: BARRALONG AND THE MISSING LINK

15 m, presenting a path of several fractured rifts, one of which was somehow fortuitously located through zero visibility, rising to the surface through a tight vertical rift.

The surface presents as a small lake and a stream cascades into the lake from a crawling-sized tunnel off to one side. While the dive is cold, the crawl along the stream tunnel is obstructed by sharp blades of limestone. In full neoprene and dangling dive tackle, this onerous crawl regenerates feelings of warmth but no love for sharp limestone.

There are two or three short sumps with adjoining air spaces. I intend in future to make sure that none of these rooms has leads. I am sure I have checked them but we are always focused on the far point of exploration and now, in the comfort of home, I am unsure how well we have searched here. From the last of these rooms there is a tight and short exit rift and then at right angles an intersecting rift perhaps 1 m wide.

The room has vertical walls, providing no rest place out of the water. This rift pool is 6 m deep. At the bottom, a rounded tunnel with an emerging water flow is blocked for divers by sandy floor. Scooping and digging sand out of the floor is possible but there are limited places to put the excavated material. A flood might one day do the excavation for us. I find you get more wishes granted if you wish for things that are likely.

This rift may be the way to the Great Southern Limestone. The dive to this place is not easy. Time spent at this place is limited by cold and also the endurance of the support team, with motivation waning after many hours of waiting.

Back in the warmth of the Cavers' Cottage, the post-examination conversation mixed with wine, port and a good meal tells us there is something there: we just need to go back again with a bottle of port.

Phil's maps (perhaps I should say the SUSS maps) show the underwater section to be directly under where the snout of a mountainside descends to the valley floor, near a small karst feature known as Hobbits Hole. In my early caving years Mike Lake took infantile delight in enticing new SUSS members to squeeze with some difficulty into the entrance of Hobbits Hole. Beyond the squeeze is a small domed room that then goes nowhere, but is made slightly more interesting with the signatures of the early guide explorers Voss, Wiburd and Edwards.

Facing up the valley, the underground river's position stops short of showing if the underground waterway dives under the mountain on the left or crosses the valley to the right under Block Cave. Block is mostly vertical, dropping under the right-hand mountain. There is not much in it. As a young caver I climbed down confidently but looked back up its vertical shaft to encourage a young lady uncomfort-able at making the climb. As I called my expert advice and encouragement she knocked a small stone off the climb into freefall, breaking half my front tooth off. Expensive business, dentists.

We have yet to find how the Southern River is related to the spectacular Bottomless Pit on the right side of the valley. Contrary to its name, the pit does have a bottom. In the past we descended the multiple \mathbb{H}_{d}



JENOLAN UPDATE 2: BARRALONG AND THE MISSING LINK

pitch hole with ladders. With much less environmental impact, we do the trip these days as a multi-belay SRT trip. At its bottom in a big chamber you can stand next to a huge fallen boulder, hearing and feeling a strong breeze emanating out of the craggy floor, suggesting a huge cavernous presence—something else that you just can't get to.

A lot of work has been done this year in the Southern Limestone, mostly by Rowena Larkin. She has relocated many caves and found a lot of small new caves with some potential. The back of Barralong somehow relates to a huge valley and underground river system, yet to be discovered, traversing about four kilometres all the way to Paradox Cave.

After saying the big adventure is to the south we then instead focus inwards. On one dive trip to Barralong Lake, instead of pushing south, I investigated the river going the other way—north, back towards the tourist caves. The story that had been told to me was that the downstream river flowing out of the Barralong Lake flowed into an impenetrable rock pile.

On the contrary, there is a short sump followed by a canyon passage with kneedeep water where you wade and stagger along stream passage and then another sump followed by more canyon stream walk and another sump. Awesome.

The canyon ends at a steep slope of jagged rocks at the edge of the water. A chamber some distance up the tumble of rock meets the roof. Unfortunately, the room which can be seen beyond is obviously unstable. To this day, no-one has mustered the bravado to explore the room at the top of the slope but perhaps, with care and judicious rock moving, it could be safely negotiated. I will leave that to future generations; we have to leave something.

Michael Collins found a way to avoid the Cavern of Doom by further squeezing between rocks that were tumbling out of the Cavern and lodged against the wall where the ongoing canyon used to be. A nice piece of 'reading the cave' that I should have recognised myself.

After another few metres the passage opened to a set of small chambers full of collapsed rock pile and loosely connected with eroded keyhole-shaped channels. Water flow belonging to River Lethe could be seen though fissures in the rocks. Jason Cockayne, with a catenary smile, is captured in an iconic photograph squeezing about in rock piles trying to get back into that water.

Michael concentrated much effort visiting this area with scaling poles and climbing gear to scale an extremely muddy aven. Each trip required lots of SUSS help and the usual extra efforts to prevent damage to the floor and formations on the trip through Barralong. The climb finally yielded an uninspiring room with a small amount of decoration. Oh well.

So some progress. '...though much is taken, much abides."

Phil, Katrina and I, and others, planned to explore during a flood in the hope of finding signs of a flowing river somewhere in the rock piles. The unlikely prospects of such a plan is compensated for by the rush of being in the cave almost cut off by flood, just accessible with swims and breath holds.

The starting series into Barralong begins in an undeveloped tourist section of the Mud Tunnels. The way passes through a rock pile that exits to a steep gravel phreatic tube that is just great for photographs and at the bottom, what I regard as the entrance to Blue-tongue is in a rain event flooded to the roof.

For our trip the entrance to Blue-tongue was almost flooded, only just a chilly breath hold. There was a small airspace to give you confidence. Ted had no problem at all but perhaps that was peer pressure; you'd think he was old enough to know better. Beyond, one person climbed the 6 m Blue-tongue Pitch and lowered a ladder for our team to make it into a room that is just prior to where Barralong assumes the decoration for which it is so revered.

In this flooding situation water surged inside fissures and grikes, pouring out of some holes and into others. Tantalising sounds seem to move as you move within one of the rock piles. Slots and rifts, in this flood, hosted perched streamways. A canyon normally dry now had to be waded and then swum along. It forked one way, ending in a blind passage. The other way led to a 2 m drop, over which water poured from its perched stream into a small lake room, waist-deep and suitably cold.

Within the lake, part of the river was welling up on one side of the room, swirling around and down into another hole. Heavy boulders weighed less in the water compared to non-flood conditions and in a co-operative effort of pushing and lifting we could move some substantial rock blocking where the water came from and also where it went. With a blurry underwater entrance exposed, we tried putting my cheap 'waterproof' camera into the inflow and outflow holes and captured an image of what lay beyond. The pictures were poor. Nevertheless, they showed that there was quite a bit of room in both holes and we were inspired to come back with two 3-litre scuba tanks to have a look under the surface.

Information from the photographs was

to prove unnecessary and so was the proposed dive. I had imagined the upstream and downstream holes as being the missing link between the dive upstream back this way but it was to transpire that both holes were not possible to dive. However, it did turn out to be the missing link.

At a later non-flooding date, a survey team went to the Missing Link to survey the significant places in the perched streamways where we were now sure the river lay close by. With the flood receded the stream was gone. The perched streams were dry and the holes where water welled up from below were also dry. Now, with obstacle rocks moved aside, there was passage beyond.

The survey team followed the dry passage and found that upstream, heading towards the diving push caverns, there was a connection. In all those diving trips no-one had noticed the insignificant hole in the floor where this lead connected in.

Having missed the survey trip, I later returned with a smaller team just to have a look and see if there were more leads. The route to the diving chambers is a crawl over fragmented rock. It is a tight squeeze in places, but not hellishly so. There is a chance of other passage inside the rock pile but nothing easily presented itself. Does it ever?

Crawling through these small chambers the southern river can be seen trickling across river gravels through a lower, very small passage underneath. The flow does not seem to represent the entire flow. We know that part of the flow passes underneath the Blue-tongue Pitch and into Bluetongue Pool. Even so, there may be more. Another part passes through alluvial gravels, emptying into the Blue-tongue Pool.

The river is unknown between Bluetongue Pool and where it next appears in the Mud Tunnels, some distance prior to the tourist favourite, the Pool of Reflections. Downstream from the Missing Link, the distance where it connects into Bluetongue Lake is not very large. However, from there there is a 6 m difference in height represented by the Blue-tongue Pitch where once, long in the past, the water dropped. It now drops somewhere else. The water must make the same fall, but possibly over a yetto-be-discovered waterfall.

No doubt the previous survey group checked it out; nevertheless, I wanted to inspect what I could. Struggling into the hole, I was able to squeeze downstream. For a short way a small stream trickles across stream gravels underneath the crawl tunnel—not the main flow by any means but very interesting. At a most awkward tight spot I could see a streamlet filtering between stones packed in a rock pile. In high water conditions the water would back up from this point and create the lake conditions we had previously seen. It would not take much to move the filter stone aside, but it would take a smaller person than me, with much better knee pads and in a much more determined mood.

It remains to be seen if this new route can change the time and effort for diving the Southern Barralong's waters, but in any event this is a far more environmentally friendly route to the back of Barralong. This potential route is low, confined and with sharp rocks lining the route. I really need much more industrial strength knee pads. There are sections demanding lying down, crawling and grunting through sharp rock and a low roof. After the crawl section continuing on to the very back there are multiple short sumps, a stream gravel crawl and an irritating climb along a rift with a limestone blade running the length of it. At least it opens right at the end facing into Barralong's famous overflowing lake chamber.

On the positive side, there is no formation to worry about. There are no cliffs to pass gear up and down and the possible impact on decoration is eliminated. As an air-saving safety measure the short sumps joining each of the river canyons might be best passed using small pony bottles before changing to 7-litre bottles at the Barralong Lake. So, with a substantial improvement to our access to the very back of Barralong, we are now diverted by a significant discovery back right at the start of Lethe in the Mud Tunnels—the unknown section between the Lethe Hole and Blue-tongue.

The upstream side had been pushed and prodded and each time yielded just a little more. Eventually, in August 2012, Rod O'Brien passed Lethe's vertical squeeze using a setup of lightweight gear so as to pass the infamous vertical squeeze. Michael Collins acted as support diver, passing auxiliary tanks and other bits and pieces through the squeeze to him. On the other side he crossed into a larger volume and that is always good when cave diving.

Rod's examination, quick and cautious, reveals passage developing into something more substantial and running off along a sequence of tunnels.

After establishing a route and experimenting with various techniques for passing through the squeeze, a dive procedure was practised. This exploration is not an exercise in bravado. A lot of time is spent in the multiple dives examining the passages and even more time talking about it over beers. After this first passing the real exploration was to begin.



Rod O'Brien tanks off heading through the squeeze

It was not until October that we could all get back. Michael couldn't make the later trip because of other commitments. We try to include the people who have worked on making the breakthroughs, but sometimes business is business.

It was apparent to everyone in the know that our group was about to find the missing section of River Lethe between the Mud tunnels and Blue-tongue, something dive trips had poked at for years. The squeeze had been passed several times now and next trip was likely to be the breakthrough.

With the anticipation of new discovery, Lethe was a favourite topic. There was analysis of the Lethe squeeze and opinion from several quarters that all the line, now somewhat aging, should be replaced with new orange 3 mm and past exploration blind route line removed.

The squeeze did not have a line placed down the notorious Vertical Squeeze because there was much experimental manoeuvring in the unusual passage geometry and a line for this short section would just get in the way. Even though the forwards and back is unmistakeable, how many cautionary tales are there about maintaining that guiding line? It was resolved to put a line in but to ensure that it was secured properly and routed in a safe manner through the obstruction. We also started attaching line arrows, even though the way forward and back is quite plain.

With the appropriate WHS requirements taken care of, Rod began his exploration on the other side. Deborah managed to film some of the calisthenics with a Go Pro video and followed him through some of the difficult constrictions. The quality of the video is poor in the limited visibility. One day, for those in the future, the quaint trappings of limited technology will inspire in the way we today view black and white caving photographs taken with Kodak Brownies.

Rod laid line along a fairly wide passage. In places the underwater tunnel becomes a surface tunnel and runs waist deep, similar in structure to the canyons found upstream at the far end of Barralong. In parts there are rift passages, part vadose part phreatic, i.e. epiphreatic, broken with the occasional joints and kinks in the waterway.

Main tasks on the journey require fixing guideline tie-offs providing a return path in a complete visual blackout and also off to one side, so as to be less likely to snag on a diver's equipment. The first exploratory journey takes longer than return trips.

Over several dives, Rod traced a path along the new section of Lethe, extending previous line placing. He ran the line out about 50 m more each time and on the last dive he was obstructed by a small rift. The passage is zero visibility. This is often the case when a site has not been dived before. After a few visits it improves to where you can see a compass and then surveying can start. It is possible that the main river passage turned somewhere else prior to the end rift.

Another dive saw 150 m of dive line placed in a series of tunnels displaying a variety of cave tunnel characteristics. The straight line distance to Blue-tongue is 200 m, but the course the river Rod is following, taking a lightning style path, will be further.

Here, in the beginning of 2013, we have not yet connected to Blue-tongue. As the river closes on the Barralong area there may be new sections of cave found and hopefully we will decipher the spectacular mysteries of Barralong itself.

It seems likely that we will achieve this and I hope one day to dive from the back of Barralong and do the full trip all the way to Blue Lake. This is, of course, not a final symbolic dive, since the way south is also calling.

ACKNOWLEDGMENTS

Those in support during this time:

Katrina Badiola, Michael Collins, Jason Cockayne, Deborah Johnston, Andreas Klocker, Bill Lamb, Aiden Lloyd, Merv Mahr, Phil Maynard, Scott Moores, Rod O'Brien, Greg Ryan, Tom Short, Keir Vaughan-Taylor, Jack Wachsmann, and especially our guide Ted Matthews.