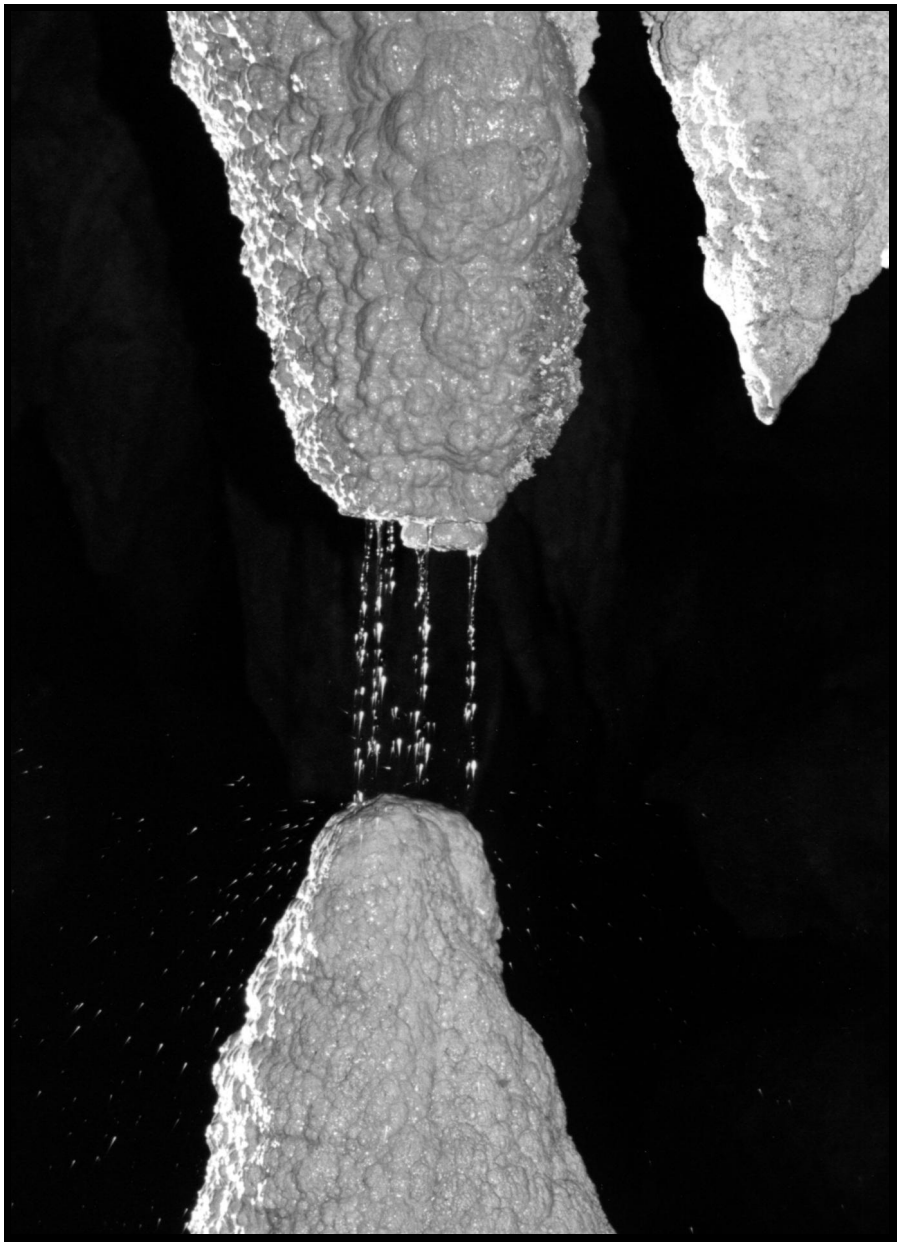
SUSS BULL 42(2)

Lumen in Tenebris

SUSS

Founded 1948

JULY – SEPTEMBER 2002



Bulletin of the Sydney University Speleological Society

 http://ee.usyd.edu.au/suss

Cover Photo: **The Electrodes, Waipuna Cave.**
Photo by David Connard

NEWS AND GOSSIP

Speleopus

A family of Platypus (Platypusses? Platypi?) are currently in residence in Blue Lake at Jenolan. A pair of platypus were seen by SUSS on the most recent Jenolan trip. It's not the first time that Platypus have been seen in Blue Lake, but according to the Guides, this pair seem to be the adventurous type. They've apparently penetrated the resurgence at least as far as Pool of Cerberus in the southern showcaves and have been seen on the western side of the Grand Arch near Caves House. We wait with bated breath for the first account of a diver coming face to face with a platypus in the show caves (it would make a change from eels). Phil Maynard

More about Double Rope Abseiling

There's been a large amount of feedback on the item in the last Bull about double rope abseiling. In brief, an abseil using two ropes will sideways load a figure eight knot if that is the knot used to tie the ropes together. This has resulted in at least one fatality. Here's some more information about this. The mechanism by which a figure eight knot can fail if loaded sideways is not simple slippage. The knot is actually pulled inside out, and due to the symmetry of the knot the result is a figure eight knot which looks exactly the same as the original knot – except that the tails of the knot are now ten centimetres shorter. The process can repeat until the tails pull through the knot and the ropes part company. The force required to invert a figure eight is high enough to be outside the realm of normal loading during an abseil – a shock loading is required. However, if the knot is incorrectly laid (the strands cross over each other inside the knot) then the load required to invert the knot can be Very Low.

Many people advocate (and are taught) the use of an overhand knot instead of a figure eight knot to tie the ropes together. Because an overhand knot is asymmetrical, it should not be able to repeatedly invert when sideways loaded. Is an overhand knot safe? This has caused many arguments in the climbing community, but the following is the only data produced on the issue that I know of. This was posted to the rec.climbing newsgroup (sorry about the American units. 2.2 lb = 1 kg).

From: Tom Moyer <tmoyer@alum.mit.edu> Newsgroups: rec.climbing

Ok – here's the next round of tests. Should add a little more fuel to the fire...

Some comments: When the overhand inverts, it doesn't really do the same thing as the 8 does. The 8 flips completely around and it's really obvious. It also eats a huge chunk of the tails when it does. The overhand kind of twists a little, some more rope goes through the knot, and the force goes down. Any time I pulled on the come-a-long and the force went *down* a few hundred pounds or more, I noted the peak force before it happened. I'm going to change my terms and call it "rolled" to differentiate it from way the figure-eight behaves.

Tests 18, 19, and 20 are on double fisherman's knots, pretty much the gold standard for comparison. As before, the load is on a single strand, with a figure eight on a bight at each end. For #19 and #20, the double fisherman's is loose and mis-tied in every way I can think of that you could still sort of call it a double fisherman's knot. Definitely the worst excuse for a DFK I've ever seen.

Rope B: Unknown manufacturer red 11 mm dynamic – used

Test #13: RopeB/RopeB – overhand – well dressed, pretensioned loosely.

Rolled at 1070 lb, Rolled at 1120 lb, Rolled at 1470 lb, Rolled at 1870 lb, Rolled at 2000 lb, Rope broke at 2100 lb

Test #14: RopeB/RopeB – overhand – sloppy, crossing strands & loose.

Rolled at 200 lb, Rolled at 370 lb, Rolled at 1400 lb, Rope broke at 2100 lb

Test #16: RopeB/RopeB – overhand – sloppy, crossing strands & loose (again).

Rolled at 300 lb, Rolled at 420 lb, Rolled at 1440 lb, Rolled at 1520 lb, Rope broke at 1830 lb

Test #18: RopeB/RopeB – double fisherman's – well dressed & pretensioned.

Rope broke at double fisherman's at 2880 lb

Test #19: RopeB/RopeB – double fisherman's – sloppy, mis-tied & loose.

Rope broke at the figure-8 on a bight at 2580 lb

Test #20: RopeB/RopeB – double fisherman's – sloppy, mis-tied, loose & WET.

Rope broke at double fisherman's at 2620 lb

Editor's Comment: 200 lb?????? If an overhand knot is not correctly laid, it could easily kill an abseiller. Be warned.

President's Bit.

The last three months have flown by. In late July we held a training weekend at Bungonia. Nearly 30 people attended and we covered topics from knots to rigging and navigation to first response. We also managed to sign off on two trip supervisors – congratulations to Megan Pryke and Martin Pfeil.

The project work at Jenolan has been proceeding apace with a new entrance connected last month. With regular trips every month this is an area worth visiting if you haven't done so already. We have also been caving around the state from Wee Jasper to Wyanbene and Borenore. There are plenty more caving trips coming up and with summer around the corner the canyoning trips are creeping into the program.

There are two big trips on the cards for January – Mole Creek in Tasmania – one for the formation freaks and Waitomo in New Zealand. Full details are on the trip list. I have also heard rumours of a week long canyoning trip between Christmas and New Year so keep an eye out for that one.

On a more administrative note, the committee is looking at the finances for next year. Since the union stopped allowing us to also be registered with the sports union our finances have been tight. Last year our ASF bill also increased dramatically due to a fee hike and the removal of the first time student category. In planning our budget for next year we are looking at a fee increase of over 20% if we remain a member of ASF. The committee is currently investigating the option of withdrawing from the ASF and the impact this would have on the areas in which we cave. If we were to withdraw there would be a fee decrease. If you have any comments on this, please let the committee know. Annalisa Contos

OZTeK

The OZTeK Australian Diving Technologies Conference was held in Sydney on the 14th – 15th of September 2002, and SUSS was there. Greg Ryan and Keir Vaughan-Taylor presented an overview of cave diving at Jenolan through the years, from the early assaults on the Imperial streamway in the 1950s up to the most recent underwater mapping in the southern showcaves (can Platypus carry compasses and depth gauges?). The presentation was well received and promises to make for a good monthly meeting sometime soon. Phil Maynard

CABEZO TORTORIOS 2001 EXPEDITION

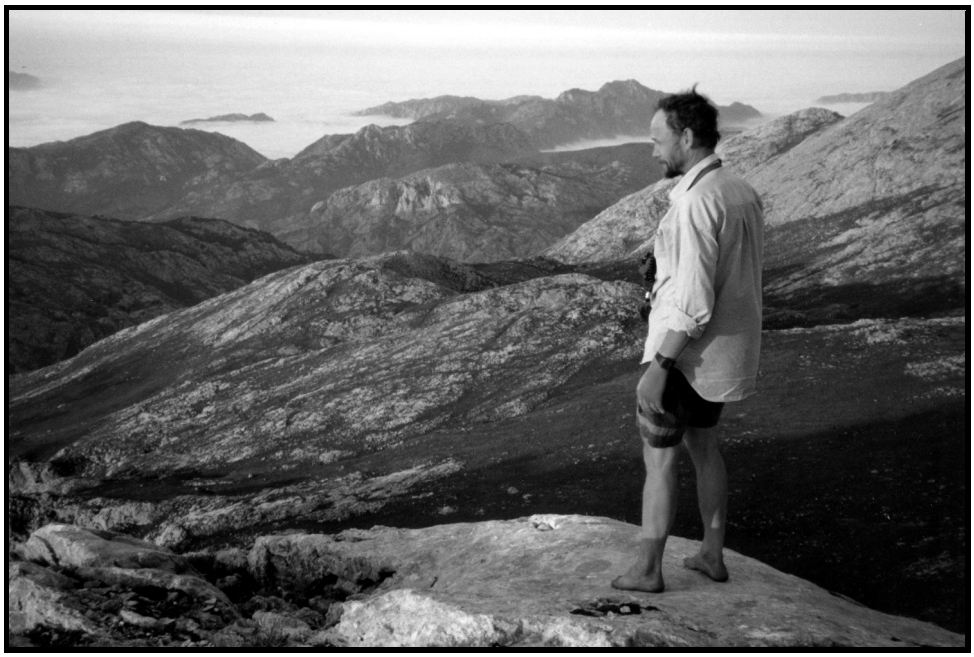
PICOS DE EUROPA, SPAIN

28TH JULY TO 25TH AUGUST 2001

BY CAR-R-R-R-OL (CAROL) LAYTON

Participants: Enrique Ogando Lastra *Zape* (trip leader), Marta Candel Ureña, Alfredo Moreno Rioja, Javier Hernandez *Javi*, Rubén Taboada, Alfonso Calvo Fernandez, José Luís Ruben *Currás*, Ignacio Rafael Ramos *Nacho*, Eduardo A. Puerta Elorza *Momi*, Manuel Jimnenez Sánchez *Lolo* (Spanish clubs); Bernard Tourte *Buldo*, Natalie Rizzo *Nata*, Olivier Guerard (French club); Fernando Pinto, Nuno Lorenço Pires Gomes *Nunobebe* (Portuguese club); Al Warild, Carol Layton (SUSS). Nicknames in italics.

I had heard about the deep vertical caves of a kilometre or more in the Picos, limestone mountains near the Spanish north coast, consisting of eastern, central and western massifs. Lucky me had managed to become part of a Spanish expedition led by Zape (To me he looks like an athletic black haired bandit out of an Asterix and Obelix comic with a dagger clamped in his mouth). He has led an annual trip into the central massif for a number of years, the area this year being Cabezo Tortorios. Caves in the area have the prefix CT.



Al in the Picos.
Photo Carol Layton

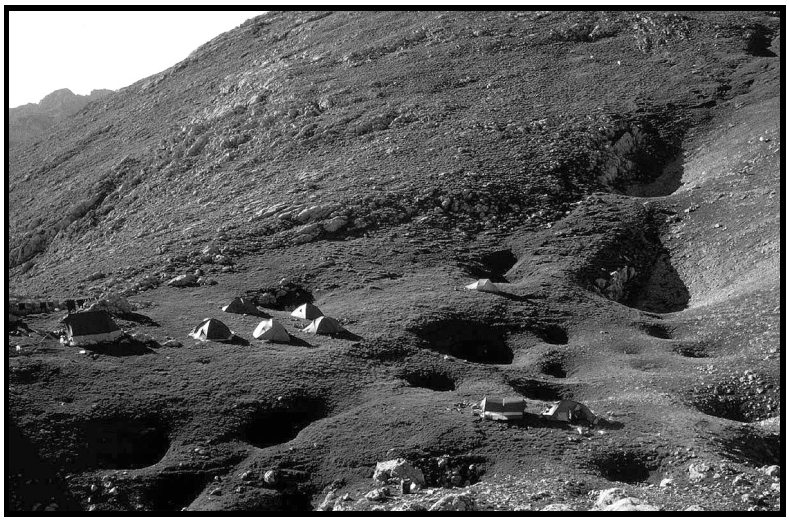
The trip was to run all of August with its main aim to push two caves, Torca de la Peña Carbonal (CT1) and Torca de la Majada del Frednedal (lit. Cave in Willow Meadow – & not a tree in sight...) (CT14), and of course look for new caves. CT1 was surveyed the previous year to a depth of 946 m, ending at a sump. Al's mission was to dive it if no other leads went. CT14 was previously surveyed to a depth of 180 m and was still going. A case of running out of time.

28th July

"Umbr-r-r-r-re, umbr-r-r-r-re". Lots of laughter as Marta and her friend try for the nth time to get me to correctly pronounce 'hambre', Spanish for hungry. I just can't roll my r's and they are not the first Spaniards on this trip to vibrate their tongues against their upper palates to show me how. "thhee-eep" is the best I can do. Personally I would prefer if they could concentrate on the road. On the right side, and that's the side we're on, there is a serious precipice, the road is under repair and there is no safety rail.

Marta and her girlfriend feel it is important that I learn Spanish as I know maybe five words with terrible pronunciation. They can only speak very basic English and are reluctant to do so as it is hard for them to think of the words. Hence, communication is difficult. They write a list of short English statements with the Spanish translation. Statements like 'tengo hambre' – I'm hungry, 'estoy cansada' – I'm tired, 'por favor, toma mi petate' – Please, take my pack, 'neccesito ayuda' – I need help. Ok, ok, ha, ha, very funny. I think to myself that when the time comes to communicate Hungry or Tired, I am not going to need Spanish. We are on our way as part of a convoy to Pandebano pass in the Picos where the helicopter will carry the group gear from 1100 m to 2000 m ASL to Cabezo Tortorios, what the Spanish call 'summer camp'.

It all looks serene with funny looking sheep with bells grazing the green fields amongst the limestone rocks. We arrive at the car park where the helicopter will land in the morning and illegally set up our tents. I count 26 people. Since the Spanish greeting is to kiss on each cheek that means I have been kissed 48 times today. Many of them are women. This will be a nice change, serious caving with women. This will be interesting considering nobody speaks English or attempting to results in agony for the speaker.



Exposed camping in the Picos.
Photo Al Warild

29th July

It is a beautiful day, the sky a vibrant blue, the grass a vibrant green, the limestone is just your usual limestone (a vibrant boring grey) and there is a lot of it. I am all psyched-up to walk up the hill with my pack. Then Zape, looking like he is being tortured, tells me in mangled English that my pack can go up in one of the two helicopter loads. Beauty! People are weighing up the gear and I am gestured to stand on the scales. Five heads peer down at the scales and make exclaiming noises. Then I am handed my pack, more exclamations. I have no idea what is going on and people keep smiling at me. Al translates; my pack is the heaviest one. How embarrassing, they are going to think I packed my makeup. Next thing, Zape indicates that Al and I will go up in the helicopter. Yippee!!! But, what about everyone else? Don't they want a ride in the chopper? Everyone keeps smiling. The ride ends up being a brilliant quick ride up the mountain. We get a fantastic view of the peaks in this part of the Picos, including the popular Pico Urriellu (2519 m ASL), an upside down u-shaped lump of limestone that on a good day is crowded with rockclimbers.

It's Official – SUSS in the Picos.
Photo Carol Layton

About 5 minutes later we land at camp. It is a flattish perched doline of something less than 100 X 50 m on the side of a mountain called Cabezo de los Tortorios (2146 m). Spread out within the larger doline are a number of tiny 2 m dolines, a mixture of nice soft grass and piles of scree. A short distance up the slope is a horizontal cave called El Purgtorio (CT3). I nicknamed it 'Fridge Cave' with its chilly 6°C inside, it even has a snow plug. As the helicopter lowered the loads of food, a chain of people formed to carry the food supplies down the short entrance drop.

Al and I set up our tents, ensuring they are pitched on grass and not scree. The place looks horribly exposed to strong winds. Al tells me that on a previous trip, every tent got flattened in a storm. We take great care in positioning our tents and getting as much cord as we can get our hands on to anchor the tents to each other and to the ground. My super light 3 season tent is looking fragile. Will it survive the trip?

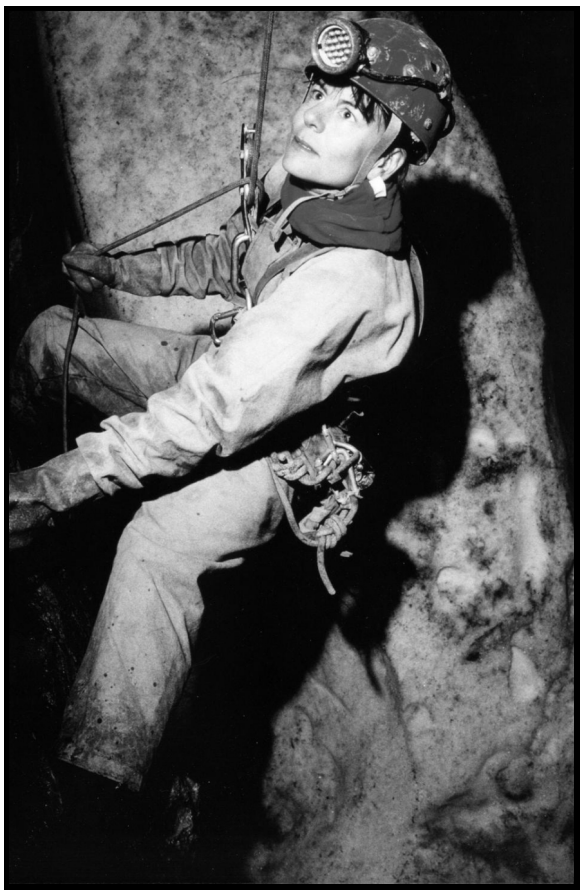
Late in the afternoon Al and I collect some water. Being a limestone area, water is difficult to come by on the surface and there is none at the camp. It takes less than half an hour to walk 1.5 km across and 150 m down to a spring in a steep gully. It then took a lot longer to walk back up with 20 litres each in our packs. By the end of the day, a total of seven people have set up their tents and the cooking and equipment tents. The group consists of Zape and his girlfriend Marta, Alfredo, Javier, Rubén, Al and me. What happened to the other 19??? It's bizarre to be surrounded by friendly people and not to be able to ask what is going on unless 'heh' with a smile is worth anything. Al explains some things to me but I don't want to bother him constantly for translations. I figure that if I do something that they don't want me to do then Communication will occur.

30th July

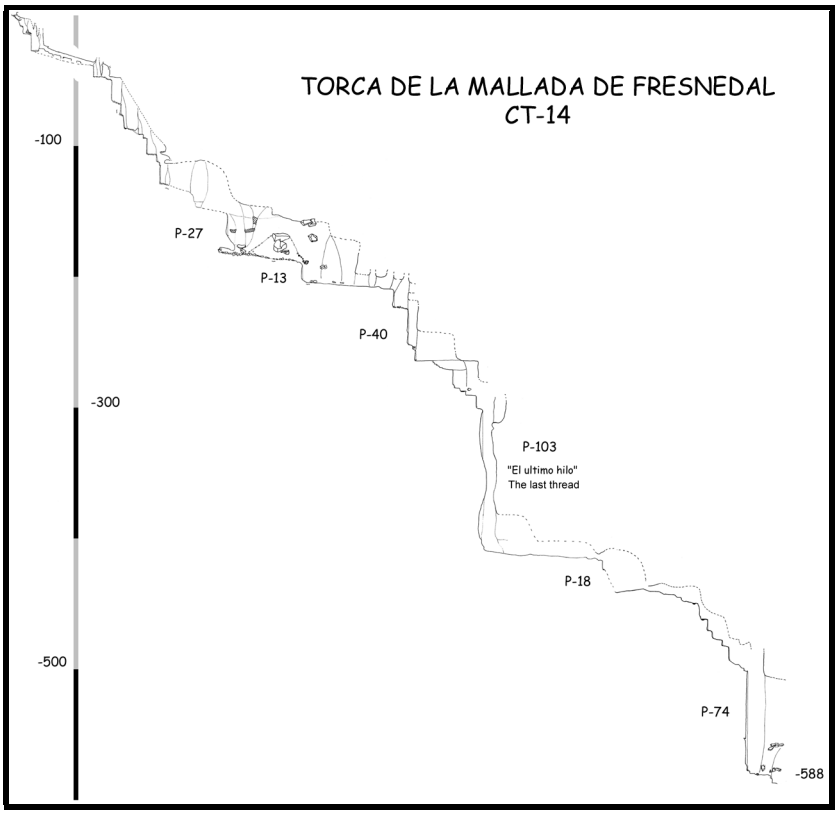
The sun has barely shown itself and there are some very strange sheep clattering around on the scree. It sounds like a dawn raid on the camp. Do Australian sheep do that? I haven't camped in a paddock with sheep so it is hard to compare. I find out later that they will hunt for food scraps, they will even eat the dirt where the dishwashing water is thrown. The worst is when they have a garbage spreading party in the cook tent when no one is in camp. Local cavers refer to them as 'Ovejas asesinos' – 'killer sheep'

A slow start for a day of caving. Alfredo, Al and I spend 4 hours in the afternoon rigging CT14. This is not difficult at all as the spits have already been drilled from last year and the knots are already in the rope so it is like Join the Dots with the rope. This cave was explored to about -180 m at the end of last year's trip. When Alfredo cannot find the spits he just gets the electric drill and sealed lead acid battery out of his pack and whacks some more spits in. In this part of the world, no one puts bolts in manually. The lead acid batteries are charged up by the solar panels at camp. What is difficult is that Alfredo, who happens to be the owner of the local caving shop, chain smokes (joints in camp, normal fags underground). The cave is blowing out and it is impossible to get out of the draught. I am to find out that many of the Spanish smoke constantly which makes sitting in the cooking tent back at camp rather unpleasant. We manage to get about 100 m rigged.

This is my first introduction to Picos caving in the Cabeza Tortorios area, sharp edged limestone with prongs and spikes to catch you, with short pitches broken up by short tight rift meanders. If you stop for any length of time, you cool quickly as the cave is between 4 and 6°C. There is a large snow plug at the bottom of the first pitch and another one at the bottom of the second pitch. However, overheating is the problem on the walk back to camp as it involves a 250 m climb up a steep narrow valley.



Carol on Rope in CT14.
Photo Al Warild



Dinner ends up being served at around 10.30pm. I find out that the Spanish love pasta and meat, hardly any vegetables and the mixture to be swimming in oil. I like lots of vegetables and little to no meat and oil but it is important to fit in and I down my meal. Communication is not too bad at dinner, I attempt to pronounce the easier words for the different foods but 'knife' in Spanish has way too many syllables. They learn to understand what I mean when I go 'eee eeee' in a squeaky voice and make sawing movements with my hand. Simple stuff but it works. One of the treats they have stocked is 'Queso de Cabrales', the local area's blue vein cheese variety. It would have to be the strongest, most pungent cheese I have ever come across and thank god I have found something I like.

10.30pm is a late hour for dinner but is normal for the Spanish. They truly know how to party and a hash joint is freely passed around. I stay up for a while to be sociable with my head stuck out part of the way at the tent door so that I can breathe. Bedtime is usually midnight or later and then the Spanish rise around 9.30 am or later next

day. Al and l are always first to head for our tents and the first to get up in the morning. One way to escape the smoke for breakfast.

31st July

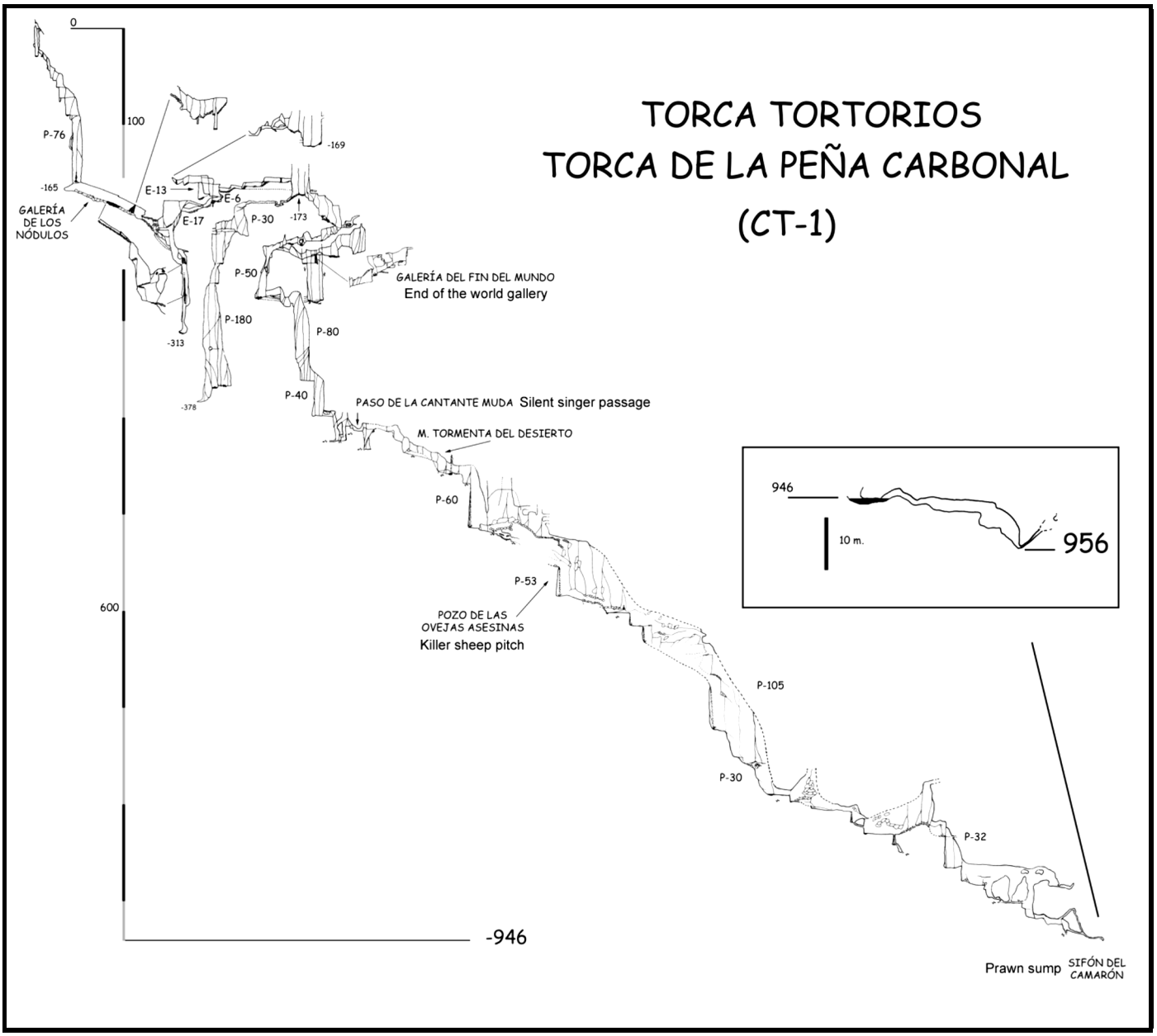
Thankfully it is just Al and I who continue rigging, also known as the 'find the spits' game in CT14. We count 45 spits for ten short pitches. Electric drills sure make a difference to putting bolts into hard limestone. We are out of rope at about -160 m.

1st August

A day of rest, sit in the sun or more sensibly, find a place to escape the sun which is a challenge as there are no trees. Alfredo spends much of the day in 'fridge cave' playing with his latest project, a centrally heated hammock that uses methylated spirits for fuel. That evening, Alfredo showed us a large burnt hole in his hammock. Some work to be done there before he can sell it in his caving equipment shop.

2nd August

A big day of caving for me. Over the last few days, people have been going into CT1 to rig the pitches. This has been relatively straightforward as rope was left at the top of the pitches from last year and only the hardware (bolts and bolt plates and karabiners) is needed. Zape and Al take packs of equipment down below the bivouac and Marta and I transport packs from where they had been dropped off at 400 m to 600 m where the bivouac is. Third day of caving and I end up reaching my deepest point in a cave ever.



The first challenge is to get to the entrance. Because the entrance is some distance down a steep hill, ropes have been rigged as safety lines as it would be difficult to stop going the whole half kilometre down the hill past the entrance if you lost your balance.

It is not an easy vertical cave by any means. From the entrance there is 165 m of small pitches with some constrictions between them and lots of sharp spikes to catch your pack on. The largest pitch of 76 m leads to a large sloping mud boulder chamber. The next section contains three short pitches that have to be prussiked with some climbs and a traverse with a section where you have to hang from the rope as you use both your cows tails to cross the knots at the bolts. That's funny; I thought we were heading down in this cave? Then a 50, 80 and a 40 m pitch gets you down to 400 m. So far, many pitches with traverses before you get to the rope that takes you down and many fiddly rebelays before you're actually down.

Entrance to CT1.
Photo Carol Layton

Finally, Pozo de las Ovejas Asesinas (Killer Sheep pitch). The base of the pitch is at -400 m and has a dry flattish floor and is perfect for a quick stop for fuelling the body with food. Another reason might be that it is an excuse to delay the next section that gets you to -600 m. It too has pitches, the largest being 80 m, broken up by tight rift meanders and a couple of serious squeezes. The second one is called Cantante Mudo (Dumb Singer – two of the early explorers were singing on their way down the cave but when they got to this meander, they went quiet...). The nasty feature of this area is that the rock is dolomite and everything is covered in abrasive coarse sand. If you are not careful, the sand gets into your gloves and down your neck. Later in the trip, one of the cavers on the way up decided he had too much sand in his suit so he derobed and found a pool to wash in. Desperate considering the temperature.

It's a long 200 m and the bivouac at -600 m is a welcome sight. At the top of the cave a trickle of water runs down the pitches but by this stage it has become a small stream. A break in the cave's vertical nature contains a small room with a flat sandy floor about a metre and a half across and three metres long. Rescue blankets are hung up with shock cord to keep the draught out and the heat in and contain a stove, food and two sleeping bags. Very cosy.

After a welcome meal, Zape and Al continue down to -800 m and Marta and I ascend to the surface. It takes 6 hours and I'm very tired by the time we reach the surface. Thank goodness the entrance is an easy walk back to camp, unlike CT14.

I am amazed at the wear on the bobbins on my descender. Because the rope in CT1 has been in there for the last four years it is covered in grit. Everyone has brought along at least one spare bobbin and it ends up being calculated that the top bobbin lasts only 2000 m. This would mean only two trips into CT1 to the bottom.

While we were away, Alfredo bought a sheep from the farmer, killed it, and chopped it into pieces for dinner. Thank goodness I was underground and missed the carnage. I guess it is one less dawn raider.

3rd August

A well needed rest day.

4th – 6th August

Sick, sick, sick. My body decides that this is a good time to manufacture some new antibodies to fight European bugs. It is such a joy to be in a remote mountain area with diarrhoea. I lie flat on my back in my tent and contemplate life.

7th August

On my own I go down CT1 for -165 m and back out to rebuild my strength. Back at camp, numbers have increased to ten. Momi looks like a real hippie with the long hair and thin build and is rarely seen not smoking a joint. He is the explosives expert – he makes them himself. Momi grabs the opportunity to play and attempts to push a doline adjacent to camp. Lots of explosions but no luck. It is actually illegal to use explosives but for the last few days we have been hearing distant explosions as they widen the main road in the area. Al has gone down to the depths of CT1 to help with rigging and to look at leads. Nothing found yet. Others have pushed CT14 to -400 m.

8th August

Back to CT14 but this time with Alfonso to survey the section beyond last year's -180 m end point. Apparently Alfonso is the type who is very slow and methodical. He only ever wants somebody to hold the end of the tape and he does everything else. Al explains to me that the others think the situation is hilarious as Alfonso doesn't know any English and of course, I don't know Spanish. It ends up being six long hours of surveying with me going ¿sí?, ¿sí?, ¿sí? with the tape. As in Here?, Here?, Here? 'Sí' actually means yes but it seemed to work.

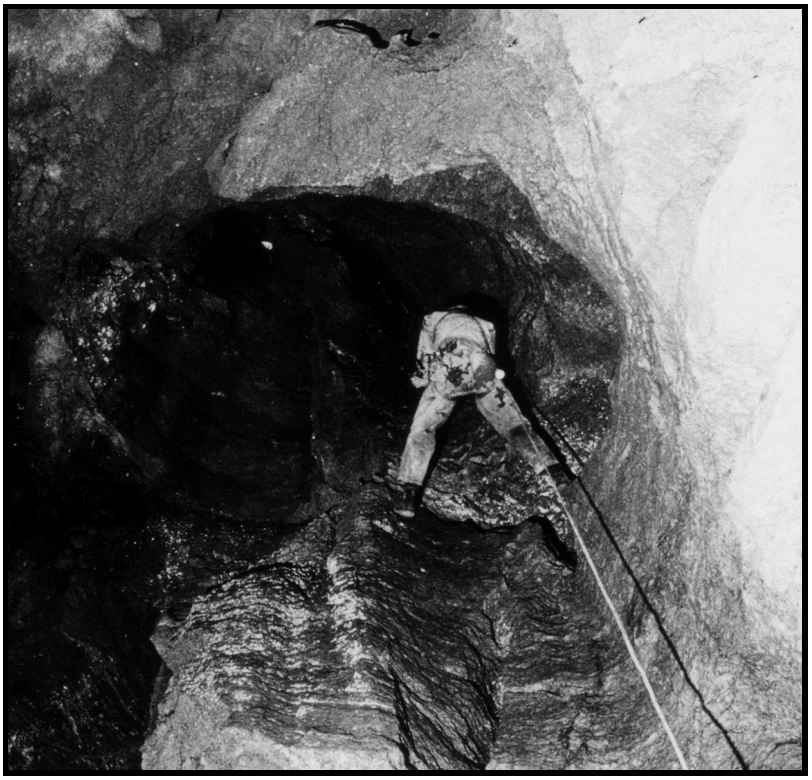
9th August

Rest, I need rest.

A Typical Rifty Bit.
Photo Al Warild

10th – 11th August

THE FINAL THREAD or HANGING BY A THREAD (Your choice) The day I came close to dying. Al and I went down CT14 to push the cave except I had a very bad experience on the way back. First we descended the cave to a chamber at -400 m with the last pitch measuring a fantastic 103 m. We surveyed on from there and were back into the short pitches broken up by meanders, so despite using 80 m of rope we only got 50 m of surveyed depth.



A Sharp Pitch.
Photo Al Warild

We had not only run out of rope but Al was not altogether pleased with having to manually put in the bolts to rig the short pitches. The heavy lead acid battery that had tested as charged on the surface contained no current to fire the electric drill.

We called it a day, delighted that the way on appeared to be a decent sized pitch of around 70 m. I took the lead and since we had entered the cave at 1pm and it was now 10.30pm, I was thinking about the hot food and the nice snugly sleeping bag in my tent. We made our way back to the chamber at the base of the 103 m pitch.

I prussiked up to the first rebelay 7 m off the floor, crossed over, then swung a short distance to the left and I started prussiking up the next section, 34 m to the next rebelay. I concentrated on keeping my breathing even and pacing myself out of the cave, which means that I tend not to bounce as aggressively on the rope as some people do, thank goodness.

After prussiking some distance, the rope lost its bounce as if I was approaching the rebelay. I looked up to see if I could see it with my light. What I saw baffled me. Instead of a rebelay with the compulsory loop of rope to the side I saw the rope move quickly up and down on the wall, caught on a spike. I could see in the dimness that there were furry bits sticking out from the rope.

I stopped moving and braced my legs against the wall to try and get a better look. This caused me to stand up straighter and I saw the rope come to a stop in its see sawing against the wall and it went 'twang' and I swung further to the left. The rope was now clear of the wall. I could see a serious rub point on the rope and felt concerned. It had not hit me yet just how serious the rub point was.

I yelled out to Al that something was wrong. The chamber is acoustically poor with lots of echo and he had trouble understanding me. Pretty vague statement anyway. I prussiked the short distance to the rub point and it was then that I realised just how bad the it really was.

Oh no!!!!!! It looks like I'm not going to make it home. Images of loved ones flashed through my mind. It felt like that any moment now I was going to fall to my death. I was looking in horror at the rope and it hit me, I did not want to die. It sounds clichéd but that is exactly what I was thinking. Thank God, the rope had freed itself from the spike. What if.....

It hit me very hard. Centimetres from my lead ascender, the 8 mm Roca rope was shredded at one point to four very skinny threads, two of them rubbed and with the sheath completely in ribbons.

This was not a place to hang around, 35 m above the floor hanging on a rope that had lost its sheath (30% of its strength) and with 4 out of 8 threads cut. Not that I was thinking about the mathematics – all I could see was 4 very slender and stretched threads connecting 2 shredded ends of a rope and me on the wrong side of them.

My first thought was to prussik above the damaged section and put a knot in the rope but when I placed my lead ascender above it, the sheath simply unravelled. My ascender ended up on the 4 threads. This had not been my intention at all. I'm sure my eyes would have been the size of saucers and the adrenaline was well and truly pumping. My lead ascender didn't even grip the threads and came sliding down. The thought of the ascender cutting what was left of the rope horrified me and I placed it carefully back underneath the damaged section.

I yelled out to Al "The – rope – is – shredded!" He yelled, "Come – back – down!" Of course, that was my only option left. I changed carefully over to abseil thinking this was not the place to stuff this up and as smoothly as possible descended with my heart in my mouth.

Finally, clipping my cows tail into the rebelay lifted a huge weight off me. "Yes!!" I was going to live and get home and all of that. A huge relief to be back with Al. We discussed the problem. I was in shock and all over the place digesting what had just happened. I kept thinking no, no, no, no, no, not again! I had been trapped in a freezing cold cave before – Falcon Cave in the Ellis Basin, New Zealand in 1990.[1] This brought back memories of trying to keep warm for hours on end. Then there was the problem of stopping whoever came down the rope from abseiling on the shredded rope. Al decided the best thing would be to prussik up to the rebelay and tie the rope so tight so that it would be impossible for anyone to clip his descender on. Great idea but I was in such a state that I completely confused how many rebelays there

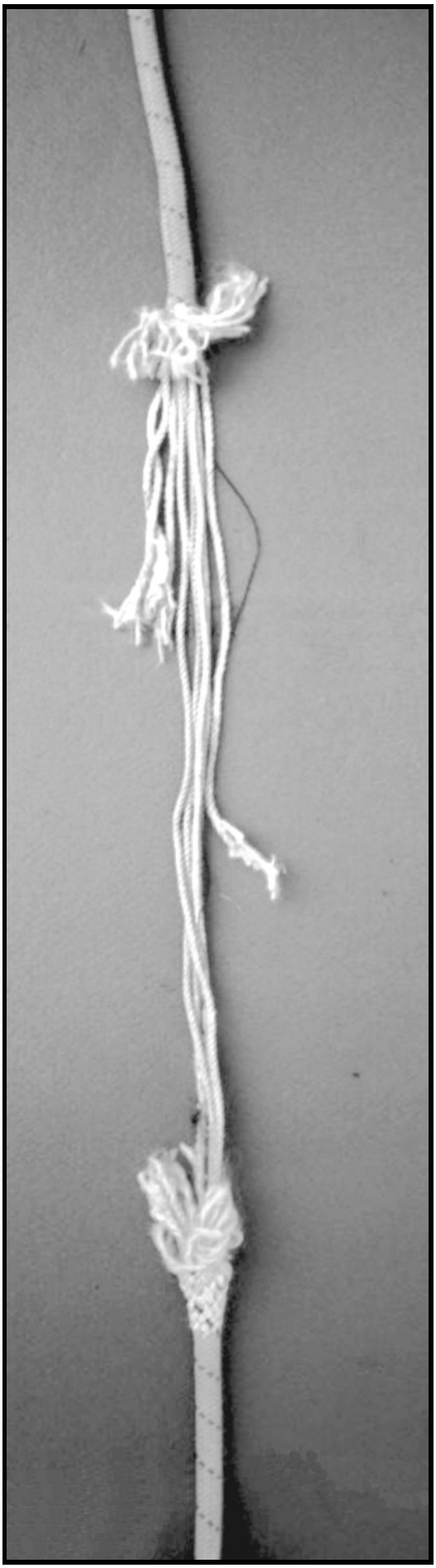


Photo Zape

[1] 'Unplanned Slumber Party in Falcon Cave', SUSS Bull Vol 31(3)

were before the damaged section of rope. I gave Al the impression of two rebelays when I knew there was only one. Al carefully prussiked up, crossed the rebelay and then ascended about 15 m and he too could see the shredded section.

Oh no!!!!!!!!!!! I was distraught with what had happened. I had plans of keeping my feet warm while we waited for help by ensuring Al's feet were in the same plastic bag as mine. Instead I had sent him potentially to his death. Al prussiked to a nearby ledge and got his weight off the rope.

He needed a bolt kit and rope. All of which we had left at the bottom. I took off, very conscious of not making any errors as I abseiled down and prussiked back with a loaded pack. Al had to wait over an hour on a ledge measuring about a metre long and a third of a metre at its widest.

I attached what Al needed to the end of the rope that happened to be knotted into the first rebelay and he pulled it up. He hammered in a couple of bolts, tied in a new rope and abseiled down. Another huge relief.

We discussed what to do. We could wait until someone turned up, many hours wait. It was 2am and we didn't expect any movement in camp till after 9.30am. It would then take several hours for people to descend to the chamber.

The thought of huddling together with our safety blankets appealed to me but the hours would pass very slowly. Al suggested a bolt climb from the ledge to the level of the damaged section of rope where he could put in a knot. I would belay. Al figured a 15 m distance to cover, say 15 bolts. Boy, did we wish the electric drill was working.

We both prussiked up to the ledge and Al got started. He hammered in a bolt by hanging off the previous bolt using his cows tails and a shortened foot loop. The belay rope passed through a carabiner like a rockclimbing hanger. The non-dynamic belay rope never was weighted as it was just a backup.

After many hours Al had hammered in 11 bolts for protection, 3 bolts for belays which adds up to 21 for this trip, a record for Al. He had to rest his arms often and all I had to do was concentrate on the belay and sing. He asked me to sing so that he wouldn't fall asleep. First time anyone has asked me to sing for hours on end. Just shows how desperate we were.

The Rope that Gave its All.
Photo Carol Layton

At about 1pm, Javi and Momi appeared way above us. They came zooming down the ropes and I felt very glad to be near the damaged rope otherwise we would have had enormous difficulties yelling up from the floor of the chamber. Al calculated that he was only two bolts, about 1 hour from the shredded section of rope. Wow!! I just wanted to get out of the cave and be warm again. Javi and Momi had food for us, which was massively appreciated.

Apparently the group were concerned we hadn't returned during the night and wondered if something had gone wrong. I was happy to hear the mumbo jumbo Spanish as Al described what happened. The look of horror on their faces showed they understood the danger of this pitch.

We prussiked out very tired and reached the surface after 5pm. The sun was shining, the sheep were bleating and we collapsed gratefully onto the grass. When we walked up the hill, a wild looking Spanish caver came flying down and wrestled Al and I for our packs. I must have been feeling better than Al, because I resisted for longer. It was much appreciated.

12th – 13th August

Rest, rest, rest. Most mornings on the trip I have been doing the washing up but I'm not allowed now. The Spanish are so glad that Al and I came to no harm in CT14 and they

insist that we relax and rest. To stop me from doing the dishes in the morning, a couple of them start throwing the newly washed dishes on the ground. I get the message and we all smile at each other.

14th August

Today is the day that Al dives the sump at the bottom of CT1. Over the last week various cavers have looked for a way on past the sump but have been unsuccessful. For some strange reason all the fellows don't want to help Al out. So it ends up that Javi and I are to descend to the sump. Most of the diving equipment is four pitches short of the sump.

This ends up being a trip to end all dive equipment lugging trips. We entered at 1.30pm and descended down to the bivouac and fuelled up for the next section. The cave is quite straight forward until -800 m. Then it gets plain nasty with wide slippery meanders. In many of the meanders closer to the surface there have been rigged traverse lines but not down here. I don't enjoy this part of the cave as I am tired enough to know that if I slip then there it is going to be very difficult not to fall the whole way down the rift. The pack I am cursing will not help either.

At -900 m we had to pick up more packs of equipment. A flood had surprised the previous gear carrying team at this point and they had abandoned their three packs. So we now had six packs between the three of us. With teamwork we got those damn packs down to the sump at -946 m.

The sump is a small puddle with an even smaller passage heading out the back of it. Al spends an hour throwing on all his dive gear. He sure needs the wetsuit, as the water temperature is 6°C. After disappearing for over an hour, he returned with news that the sump ended up being 6 m long. Then he found a low, winding crawl passage that went up and down with a few stretches where he could walk. At about 100 m, the passage became clean with lots of solution teeth and rock spikes. After a couple of climb downs the passage went back into a muddy duck under squeeze that required digging. Not an ideal place for a cave dig. All this effort for an extra 10 m of cave depth.

We started back to the bivouac at 2am and got there at 6.30am. We ate and then slept with the three of us jammed in two sleeping bags zipped together. Of course, I got to be in the centre. It amazes me how much heat can be generated in a situation like this when you are wearing every thermal you can lay your hands on. We slept till woken up by Zape at 3pm and finally got out by 11pm.

15th – 21st August

People take turns to derig CT1. As the packs are emptied each day the pile of rope to be discarded grows larger than the pile of rope worth keeping. After our incident interest in pushing CT14 wanes. This cave will be the focus for next year's trip.

22nd – 24th August

After 4 years, CT1 is completely derigged except for Javi's lunchbox that's still somewhere in the bottom of a meander. A final push takes CT14 down the 70 m pitch that Al and I left (which is more like 90 m), and then down another short drop. The survey brings it in at -600 m and then all the metal-wear is removed to avoid corrosion and because it belongs to several different clubs. We make several portage trips to carry whatever gear needs to go back to civilisation – things like the four power drills and roughly 500 karabiners and hangers.

25th August

For the first time everyone is up by 9.00am. Pack up the big tent and stash everything into the fridge cave for another year, then a last walk down in the blazing sun, a quick skinny-dip and rope washing session in the river and then on to the sidreria (cider bar/restaurant) where we eat and drink ourselves sillier.

Time for the Sidreria.
Photo Carol Layton

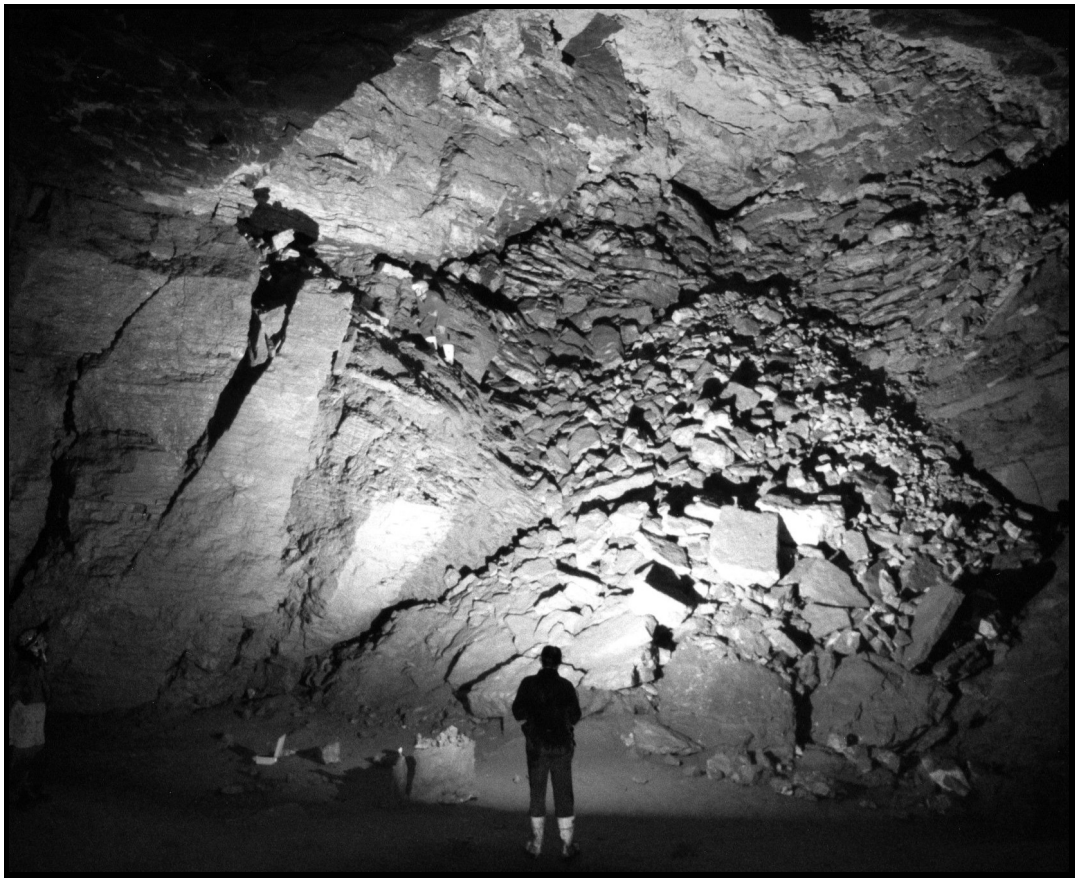
CAVE TILL THE COWS COME HOME

WAITOMO, EASTER 2002

TEXT AND PHOTOS BY DAVID CONNARD

Participants: David Connard, Gareth Cross, Carrie Earls, Andrew Matthews and Jenny Mee

This year, Jenny and I had plans to be in New Zealand over Easter for a friend's wedding in Auckland. This seemed like a great excuse (as if you really need one!) to go caving in Waitomo for a couple of days. For those who don't know, Waitomo is located on the North Island of NZ, about 2.5 hours south of Auckland. It is a large limestone area (by Oz standards) with several major river systems flowing underneath it. These form very impressive and active streamway caves. Unlike many of the other caves in NZ, the Waitomo caves are relatively warm, although wetsuits are definitely required for many of the wetter caves.



Collapse Chamber in Reserve Cave.

The number of great caves in the area means that Waitomo is a caving area you can come back to time and time again, and still see new, great caves every time. This was my third trip to the area, and I've already done some of the great trips, like Mangawhitakau, and the Downstream Mangapu (Auckland – Hamilton Hole). This time, I wanted to see a few of the caves that a previous SUSS trip had got into – in particular Virginia Cave, which contains an incredibly well decorated upper level, called the Hall of the Gods.

As we were only going to be in Waitomo for 4 days or so, we didn't plan ahead too much. In fact, we hadn't planned beyond turning up at the HTG hut, and seeing who was around to point us in the right direction for the various caves we wanted to do. However, the simple job of getting into the country proved all-too-difficult for Jenny's luggage – which was finally located in Buenos Aires around 3 days later. Thankfully, that particular wayward bag didn't have any caving gear in it, and so we were still able to go caving while waiting for it to return. The next problem was that when we finally arrived at the HTG hut on Friday night, there were no cavers to show us around.... in fact the hut was empty (except for the cat) – which is almost unheard of at Easter.

Saturday – Reserve and Huhunui

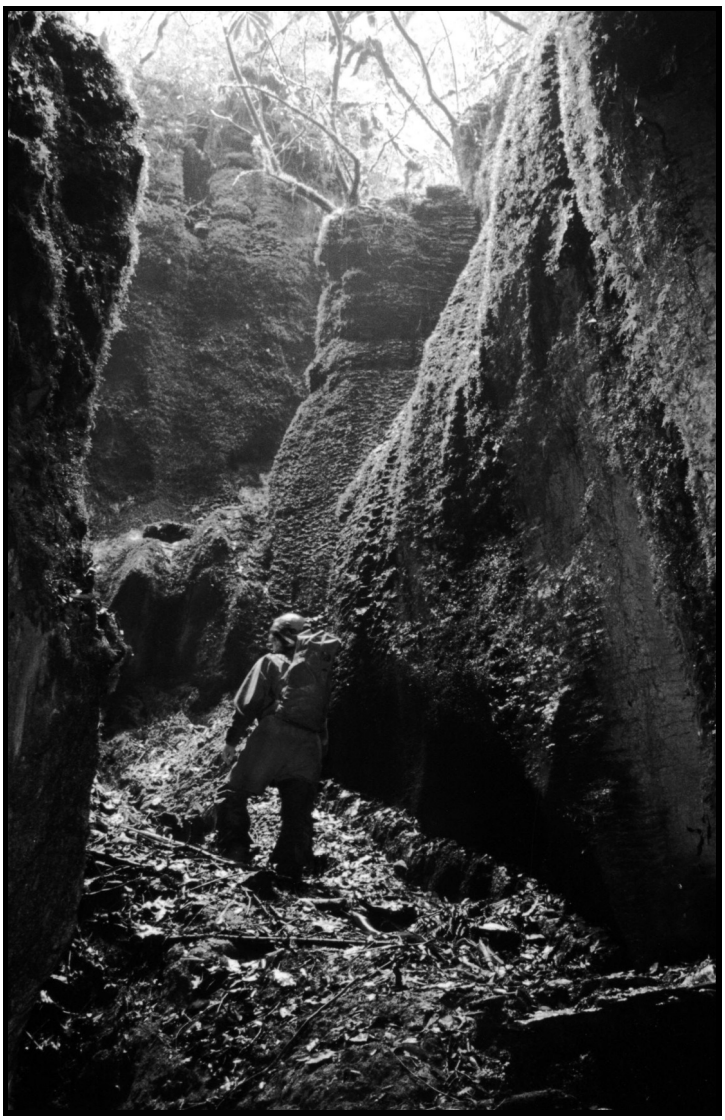
So, we decided to spend Saturday heading back up to Hamilton to do some shopping (toothbrushes & the like) to replace the items in the missing bag. Within half an hour of us getting back, the phone at the (still empty) hut rang, and we heard Andrew Matthews' unmistakable kiwi-eccent on the other end of the line! Great – the trip was saved. Within half an hour, Andrew was over with half a case of beer, and it was time to plan out some caves. As it was already late in the day, we couldn't do any major caves today. Instead, we opted for two short caves, Reserve and Huhunui, both on the far side of the valley opposite the hut.

Reserve is a large fossil passage up on the side of the valley, which once carried the Waitomo River. As such, the passage in this cave is large.... It's only a short cave – about an hour's worth before it ends in a huge breakdown chamber with apparent no way on. However, the size of some of the chambers is truly impressive. Finding a way through the terminal breakdown would certainly lead to more large cave.

From Reserve, it is a short drive and a pleasant walk to one of the several entrances to Huhunui. As we arrived at the carpark to this cave, the daylight was just beginning to fade. We had a very pleasant walk in through some complex rainforest as it got progressively darker, and the glow-worms began to come out. Waitomo is famous for glow-worms in the caves (they like the dark, wet places), but I'd never seen them before in such abundance just walking through the rainforest. Very impressive. Soon enough, a small stream was encountered tumbling out of a cave entrance, and in we went....

Huhunui is not a long cave either – but unlike Reserve, it has a small, very active streamway flowing through it. It isn't very deep (except for one entertaining pool), and you spend most of the cave wading through it at up to knee depth. The stream breaks out of the cave entirely in several places along its length, with either large daylight holes, or complete breakdown. It was a pity that there was no daylight to see coming in through the daylight holes by now – it was well and truly dark by this stage. Again this cave was short, about 1hrs worth before we were back to the cars. Navigating the track to and from this cave would have been extremely tricky without Andrew's guidance – finding a willing local guide for this cave is pretty much mandatory for navigation (and it appears to help greatly with gaining permission too).

That night, we discovered that the Pub in Waitomo is apparently no longer the place to eat. The previous owners of the pub have sold up, and taken over Curly's Cafe – which is just before the Caves Museum, near the unexplainable big green bird driving a jetboat !?. Curly's Cafe serves tap beer, plus has pretty decent food – the menu when we were there was excellent, much better than the pub fare we had been anticipating.



Entrance to Waipuna Cave.

Sunday – Waipuna

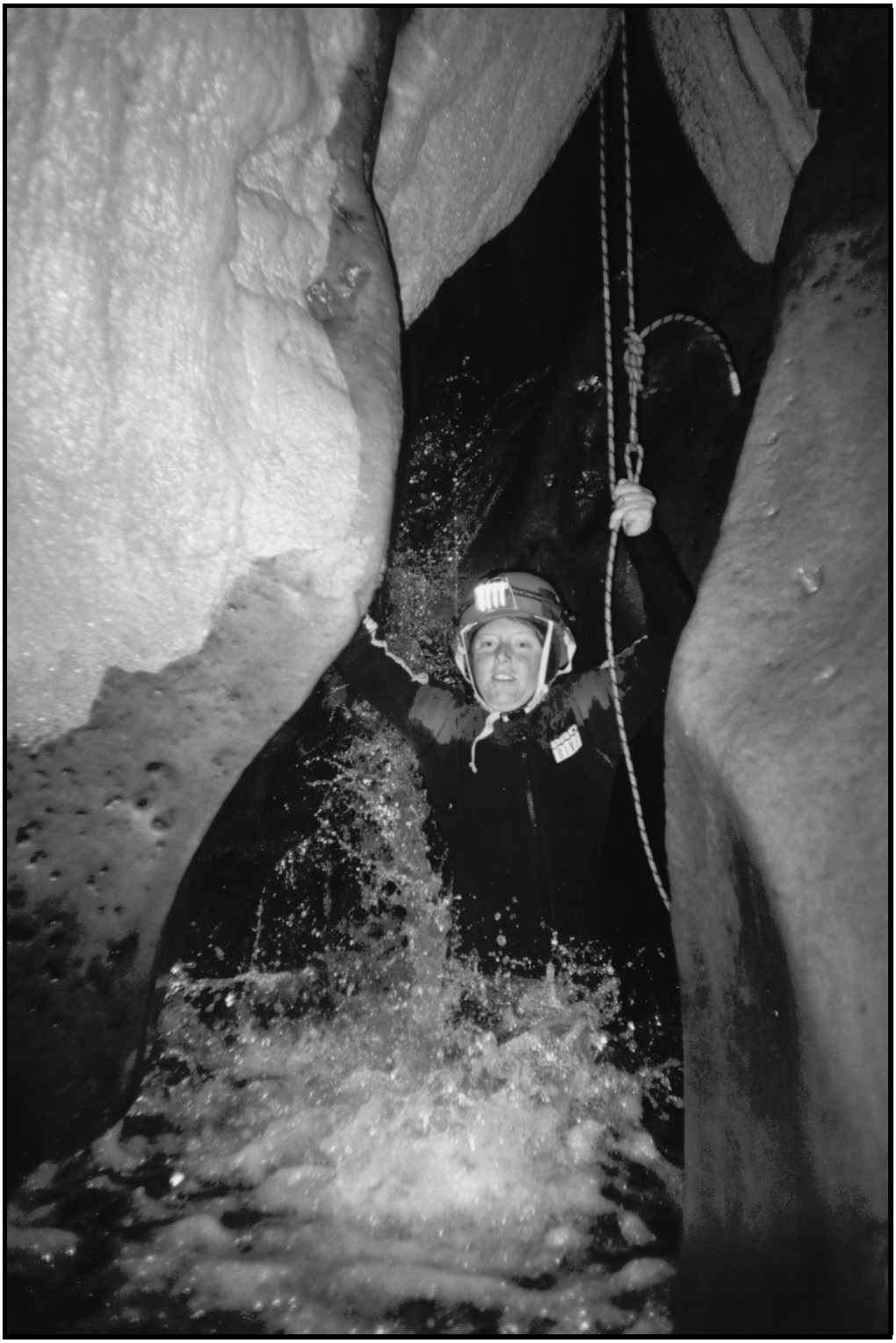
With Andrew off at work, and still no cavers around to show us any new caves, we were limited to doing the caves I had done before. As Jenny had not been into Waipuna before, we went and had a look in there.

Waipuna is a long and spectacular streamway cave, which contains lots of good formation in various places hidden away from the streamway.... if you know where to look for it. Unfortunately, we generally did not, and were limited to appreciating the formations that are obvious from the streamway itself. The cave is accessed via a big tomo (ie. entrance shaft, or collapse doliney-type thing) filled with rainforest-type vegetation, which drops you down into the middle of a streamway heading out of sight in both directions. Downstream is apparently a sporty trip – containing a heap of swims, and a few duckunders to get right to the end of the cave. Upstream, on the other hand, is mostly walking through the knee-deep stream, going "ooh-ahh" at the pretties. Needless to say, upstream is generally the preferred option. *[ed's note: When the cave is flooding, you just can't beat a downstream trip. No, really.]*

You could spend any amount of time in this cave, depending on how much of the hidden formation you look for, and/or actually find. It is a good two hours upstream to where the stream enters the cave. On our own, and spending time photographing, we didn't quite make it that far.

Monday – Luckie Strike

Today, two English cavers – Gareth and Carrie – turned up at the hut from Rotorua, looking for someone to go caving with. Although they had no caving gear apart from head torches, we were able to scrounge helmets and old Black Water Rafting wetsuits from around the hut, and take them into a wet cave. Luckie Strike sounded good – as I wasn't really keen to go into this cave with just two people, given the entertaining climbs involved.



Rope Climb Near Entrance of Luckie Strike.

Luckie Strike is an incredibly fun cave. In some sections, it is very similar to a tight canyon here in the Blue Mountains around Sydney, except that it is dark – and you've got to get back out the way you came in! In fact, some of the cave is apparently developed wholly in sandstone just like the Blue Mountains canyons, or across a sandstone-limestone contact. The cave starts with an innocent looking creek meandering along through a farm valley off the Waipuna Road – and then it hits the end of the valley and starts to go rapidly underground.

The entrance series is tight and rifty, full of chutes and downclimbs churning with water. You get very wet, and in high water it would be difficult and dangerous to get back out. One of the climbs needs a rope as it drops into a chest-deep pool where the chamber bells out and on your return, bridging holds are hard to find. On several of the climbs, the first person up can block the flow of the water with their bum, thereby lulling the next climber into a false sense of security until they are just in the right spot (eg with their face in the now empty water-chute) and then let it all go. Much fun was had by all, although I suspect I had a little more than other people.

After the entrance series finishes, the cave remains tight and rifty for a while, but stays fairly flat. There is a pretty section of the cave hidden in the roof at one point along here – it's well worth a look if you can find the way. Care must be taken though to avoid damaging the cave – and, as always, make sure you stick to the trackmarking.

The cave opens out at one point into a large breakdown chamber (which is apparently at the sandstone-limestone contact), before narrowing again into another rifty passage. After a little way along this passage, a side stream enters the cave from about 8 m higher up in the rift, and cascades down to the floor. It's really spectacular to see, and damn difficult to photograph. *[See the Photo Gallery. Ed]*

Rather than face the couple of swims ahead, we turned around at this point, and headed back out.

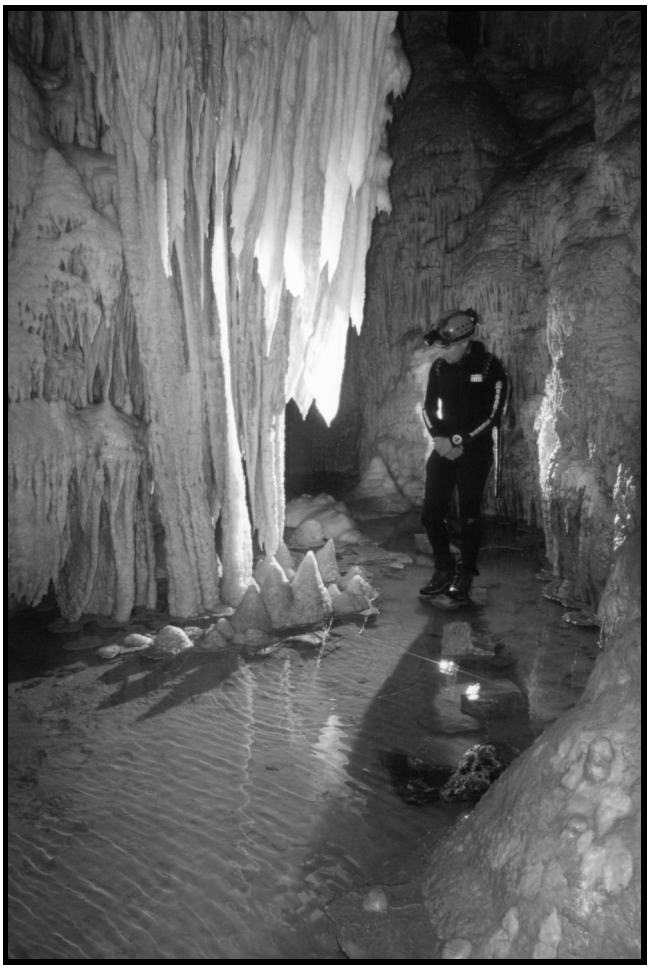
Crystal Pool in Luckie Strike.

Tuesday – Virginia

Although we still didn't have a guide for Virginia Cave, I had by now spent a bit of time talking to Andrew Matthews (at the cafe over dinner), and Norm (the old hut warden who is now working as a guide at BlackWater Rafting) trying to get a good enough description of how to find Virginia Cave. I figured that as it was our last day, that it was worth giving it a go rather than miss the chance to do this pretty cave. We were (unbelievably!!) able to scrounge up two full SRT kits from various people and gear lying around the HTG hut – and so Gareth and Carrie were able to come on this trip too.

Surprisingly enough, we managed to find the cave without too much trouble – although it did show that our collective understanding of what defined a "bloody huge pine tree" was somewhat lacking.... Virginia Cave starts out as a 30 m entrance pitch into a small streamway. Downstream from here takes you to a series of nasty bits of the cave, that finally end in a sump – which is presumed to connect with the nearby Fred Cave. Upstream of here is the way on to the pretties – the Hall of the Gods.

Looking across the lake in the Hall of the Gods, Virginia Cave.



Gareth in Virginia.

Going upstream starts out as a muddy experience. It then turns into an even muddier, and also a very wet experience, as you soon come to a deep pool at the far end of a disgusting mud pit, through which you have no choice but to swim. Unfortunately, Jenny and I had listened to the various NZers about the cave by now, and based on their advice, decided that we didn't need wetsuits. Silly us. Gareth and Carrie had nothing else to wear except the old BlackWater Rafting wetsuits, and were spared the experience of swimming through cold muddy slop in thermals alone.

Continuing upstream, some really odd dark-brown rimstone edges appeared around a lot of the pools. It was common for these to be up to half a foot wide, and extend right to the floor of the pools, much like underwater flowstone. I don't know what caused the strange dark brown colour (there seemed to be a lot of muddy silt in the cave – perhaps it was tied into land clearing above?), but their presence alone was a sure sign of good formation ahead. And sure enough, we soon reached the climb up into the Hall of the Gods.

The Hall of the Gods is an incredibly pretty upper level in this cave. A side stream drops in from a perched lake, which is surrounded by lots of flowstone, shawls, stals, and a few really interesting poached-egg formations in the shallower parts of the lake. One of the poached egg formations doesn't appear to even be supported by anything (as you can see under it a fair way), although there must be something under there holding it up. It is well worth visiting this cave just to check out this short section of the cave. Gareth and Carrie were very impressed at the quality of the formation – which was apparently well beyond what they got back at home in Yorkshire.

After a number of photos, it was time to head out and discover if the cobbled together SRT kits were actually going to be successful in ascending the rope... Thankfully they worked, although they weren't well tuned to the people, and as a result were fairly inefficient. To compound this, the pitch had been difficult to rig cleanly – without going all the way and making it a Y-hang suspended in space over the top of the pitch. The rock was cruddy, and not appropriate for bolts (or any other anchor points for that matter), which left us with only the trees surrounding the tomo as the options. In the end, we settled for a large re-direction (which left just a glancing rub point) and very gentle prussiking. As it was my own 9 mm rope, and I was to be the last to ascend, I was at least mildly concerned – but, thankfully, no damage to the rope was apparent even after 4 ascents; 2 of which were on inefficient (ie. bouncy!) gear.

When we returned, all of the local cavers finally turned up back at the HTG hut. They had spent the Easter weekend at a caving area about 1 hour south of Waitomo. Amongst other entertainment, they discovered a hungry cow wandering about inside a cave – beyond an 8 m entrance pitch and a large rockpile which was well into the dark zone. After bringing the poor thing some grass in a cave pack, they had some trouble coaxing it back over the rockpile (which proves that climbing is always scarier when you can see the drop below you!). After that, they were able to haul it up the pitch with the farmer's tractor. Such are the hazards of caving in NZ – never hang around at the base of a pitch, as you just don't know what might fall down next.... And always pack some grass along with any other emergency food you might be taking!

Poached Egg.

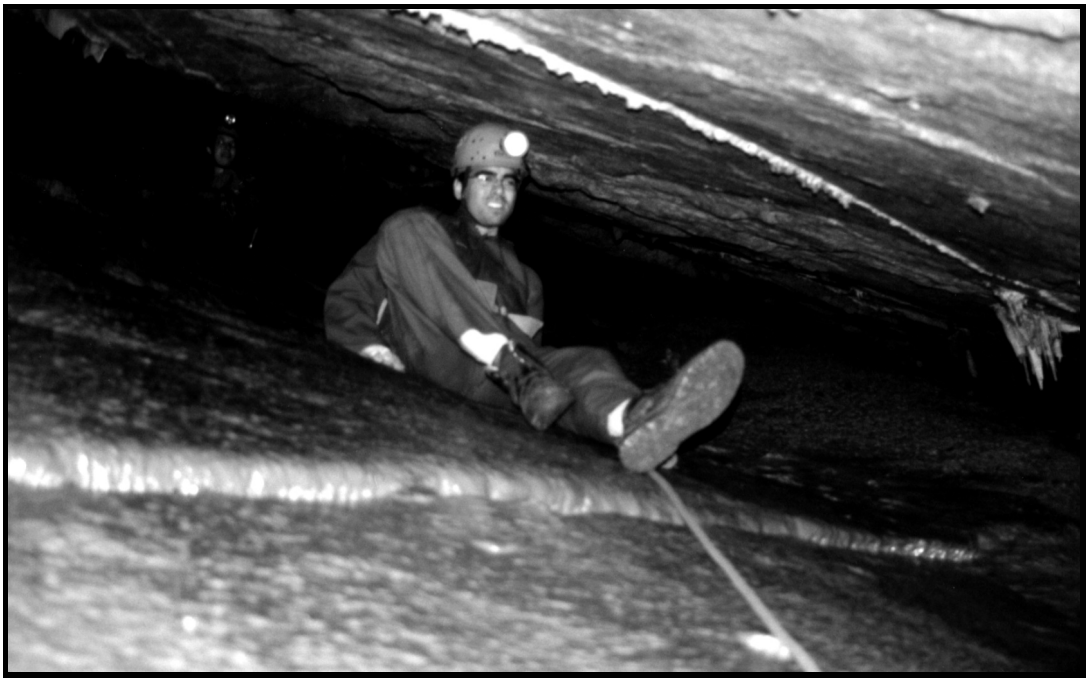
NEW FUN IN OLD CAVES AT JENOLAN

1-2 JUNE, 2002

BY DAVID CONNARD

Participants: David Connard, Jenny Mee, Annalisa Contos, Phil Maynard, Rod OBrien, Alan Pryke, Matthew Fischer, Felise Azevedo, Michael Fraser, Justin Nijdam, Sascha Morrell

Snow on the ranges above Jenolan had been predicted for this weekend.... but although it was a cold weekend, unfortunately it was not that cold. At least it didn't really rain much, and we even had some nice sunny breaks to enjoy while above ground.



Justin negotiating the climb down in Alladin Cave
Photo David Connard

Several things were on the agenda for this trip. First and foremost was to get a map of J75 completed and submitted to the guides. Next in line after that, the survey of Mammoth Cave was to be continued.... and finally, some recreational caving had to be squeezed in somewhere, for the benefit of the beginners on the trip.

J75 is a cave which currently remains un-named. Although its description as printed in the Blue Book labels it as a "grotty hole" of 2.5 m length, in recent times SUSS has had reason to believe that there is much more to the cave than just that.

Indeed, after various exploration efforts by SUSS, it turns out that the cave would be better described as a small but very significant cave of about 120 m in length, developed along several chambers in the bedding plane of muddy limestone. The final (and largest) chamber ends in a low intermittent stream passage heading south, which appears to hold promising prospects for further digging. There is a slight breeze in this passage, which is currently partially filled with loose gravel. Significantly, this part of the cave is heading straight for Great North Cavern in Mammoth Cave – which in turn is known to end in a high stream passage, also gravel filled. There are several other possible leads in the J75, however, at this stage the stream passage appears the most promising. The horizontal distance between the southern-most extent of J75, and the northern-most extent of Mammoth Cave is estimated to be approximately 120 m. The vertical displacement is at this stage not known, due to a lack of an accurate vertical survey of Mammoth Cave. Obviously, the prospect of a connection between the two caves is exciting to say the least.

On this trip into J75, the terminal stream passage was investigated a little further by Phil, Matthew, Alan and Rod, and the current survey of the cave was handed to the Guides. This survey will be reprinted in a future article on this promising cave.

While they were busy playing around in the gravel in J75, the rest of us were up for an easy day's caving in Alladin. Taking a look at the map before entering the cave, I noticed an area in the cave that I'd never visited before – a point much lower down, on the left at the bottom of the rope climb, and so I decided to take a look on this trip. This proved both very interesting, and very painful.... After a 3 m climb down, a small chamber is reached, which in turn drops a further several metres to a squeeze. On the map, this squeeze has a definite Z shape.... which turns out

to be quite accurate, and extremely difficult for any non-microbods (eg. me) to return through. However, beyond the squeeze is a larger chamber that holds excellent prospects for further cave discovery. Due to the committing nature of the Z-squeeze, it seems that very few people have visited this area of the cave (of our group, only Matthew, Felise, Jenny and I made it). There is an accessible rockpile blowing a significant breeze in several locations. There is a narrow pit in one part of the floor, which drops a further 5 m, quite possibly to a level below the rockpile. Unfortunately, it will be a squeezy ladder climb to get in there to check it out.

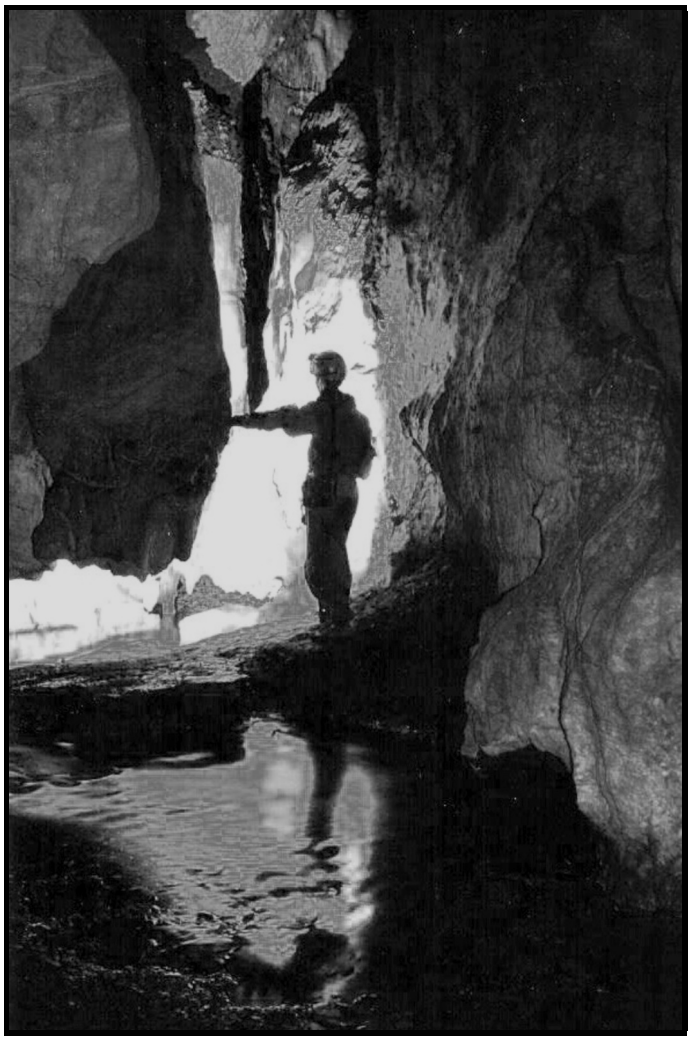
On the whole, this area looks very promising, and is certainly under-explored for its potential. Any cave discovered below this point may well connect into the Water Cavern area of the show caves, or possibly, Last Resort in Spider Cave. I definitely plan on returning to this area on future trips, next time slightly more prepared for exploration (and hard squeezing!).

After spending a couple of hours in Alladin, we exited and strolled up the valley to check out Hennings Cave. The lack of squeezing and crawling in this cave was certainly a little more to the beginners tastes, and as a result we spent a good amount of time admiring the pretty formations up the back of the cave.

On Sunday, Phil, Alan and Matthew decided to play with a laser-powered distance measurement tool that Alan had managed to borrow from somewhere, *[Lent to Alan by Armstrong Osborne – ed]* by surveying the entrance cavern of Mammoth Cave. One of the interesting points about surveying in this manner, is that it allows you to pick survey stations located high on the roof of the chamber – which are of course generally visible from anywhere else in the chamber. The downside is that the instrument in question costs around one thousand dollars, and that integrated units (ie. including a compass & clino) cost many times that!! Strange, as theoretically you could just bolt them all together, and permanently mount them on a small tripod to achieve the same result.

While this kept them occupied, the rest of us detoured via Rho Hole, before heading for Mammoth. Rho Hole (like Alladin, really) is desperately in need of a resurvey, as we noted a large (and obviously, well explored) section of cave not shown on the current map. This section of cave apparently looks down into the main chamber of Ian Carpenter cave from a balcony high up, and is a significant omission from the current map.

Our group then headed into Mammoth Cave, to have a look at Railway Tunnel and Hell Hole. After all the squeezing yesterday in Alladin, one of the new members (Justin) was keen to try his stuff in the legendary Mammoth Squeeze. As we were all still suitably lubricated with mud from the Railway Tunnel, now seemed like a perfect opportunity. With trepidation (and not just a little panic in his voice), he stuck his head in, and finally decided to give it a go. After all, Michael Fraser had done it before, and he was taller dammit. Only once Justin was well inside the squeeze was it revealed that Michael in fact hadn't done it, and that his previous response had been more along the lines of "get stuffed, I'm not bloody well going in there!"



Annalisa in Mammoth Cave
Photo Andrew Fulton

After meeting up with the squeeze-ees on the far side, we all headed out for a late lunch, and then off home. It was a really enjoyable trip, which has certainly reminded me that there is new cave still waiting to be discovered, if only you know where (and how hard) to look....

THE SHELF LIFE OF STATIC ROPES FOR LIFE RESCUE LINES

JUDITH BATEMAN & PHILIP TOOMER

THE SHELF LIFE OF ROPE

The shelf life of rope is an issue that has been around for many years. It came to a head about 10 years ago when a copy of an article, which purported to have data to support the proposition that ropes have a shelf life and that ropes degraded at about 10% per year, was circulated. This article was without scientific basis and was patently wrong. I have certainly never seen a 10 year old rope spontaneously fail!

At the time, the matter was raised with the manufacturers of Edelrid Rope and Blue Water Rope. The technical staff at both factories confirmed that in their experience the rated strength and the energy absorbing properties of unused static ropes remain unchanged over time if the ropes are correctly stored.

By chance, we had an excellent opportunity to confirm the then view of the technical staff. We were approached by a scout leader who had found an 'old' roll of Blue Water rope in a store room and was curious about its fitness for use. The roll of rope was found when the store room was cleaned out. The rope was still in its original carton, complete with serial number and had been stored in a cool dark place away from contaminants. The roll of rope was 12 years old. We swapped the old roll for a new roll.

The rope was sent to the test lab at Blue Water in the USA in time for a visit there by Philip Toomer and Judith Bateman. In the company of Blue Water USA technical staff we tested (energy absorption and tensile strength) the first half of the roll of rope. We then obtained the batch test results from when the rope was made.

When we compared the test results obtained with the original test results we found that the values were the same (within experimental error) and that the values obtained exceeded the rated strength.

Blue Water Australia has a program in place to evaluate the shelf life of static ropes. Ever since manufacturing commenced in Australia, in 1988, samples have been kept from the normal production samples. Some of these samples are now over ten years old. At five years some were tested and the rated strengths and energy absorption were found to be equivalent to those of the rope when it was made. It is intended that this will be an ongoing program.

We feel confident to say that the shelf life of a Blue Water static rope exceeds 5 years. We believe that it is far greater than that.

THE WORKING LIFE OF A ROPE

The issue of the working life of a rope is much more complex than the shelf life of a correctly stored unused rope. Many factors contribute. We have briefly discussed some below.

There is no simple, reliable, non-destructive way to determine if a rope continues to be fit for service. The NFPA standard required that only new ropes be used for live rescues as one way of overcoming this problem. We feel that solution is absurd, since used ropes are acceptable for training.

In our experience the best approach is to know the history of the rope, inspect it before and after every use and if there is any doubt about the condition of the rope don't use it.

Excessive Loads

Excessive shock loading and excessive static loading will reduce the performance of a rope. These are not things that happen without anyone noticing. However, one useful way to check a rope if this is suspected is to establish if the rope has permanently stretched. This, however, requires that the length of the rope after it has been washed, but before it was put into service, be known. Also the measuring conditions (including the tension used to hold the rope) are important.

Note: A NEW Blue Water II+ 11 mm static rope can withstand 14 Fall factor 1 falls before failure!

Mechanical Damage

Blue Water static ropes are constructed in such a way that a significant amount of the polyamide used to make the rope is in the sheath. Each rope diameter from the 2.75 mm cord right up to a 16mm Superline has a different sheath thickness. The number of ply yarns in the sheath varies when necessary as the diameter changes. For example, in 13 mm Superline, 47% of the polyamide is in the sheath.

The sheath contributes to the strength of the rope in a well balanced rope, however, in a static Blue Water rope it has a significant role in protecting the core from damage. The 22 core bundles (in a 13 mm Super Line) will each support a weight of around 150 kg without failure. A simplistic view is that the core contributes 3,300 kg of the rated strength of 4,100 kg. The reality of making a balanced rope means that the view is not totally accurate. However, it does reinforce the point that the sheath on a Blue Water rope (this does not hold for all brands) has a significant role in protection rather than strength.

Given the above points inspection of the sheath of the rope for damage as a result of abrasion will give a good indication of the safety of the rope. If the rope is simply 'fuzzy' this is not a great problem and in fact the fuzz on a Blue Water static rope will tend to increase its abrasion resistance. The fuzzing arises because the plied sheath yarns wear in a way that causes minimum alteration to sheath tension. When broken, individual fibres tend to stand out at right angles to the sheath because of the tension from the plying process.

If there is a significant reduction in sheath tension (regardless of the cause) at any point then the damaged section should be removed from the line. The best way to inspect for this is to pass the suspect area from one hand to the other while holding the rope in such a way that a large curve is made. If there is a significant reduction in sheath tension the rope will 'hinge' at that point rather than continue to prescribe a curve.

Contusions and heat damage must be immediately suspect and the damaged section should be removed. Again these are a result of events which are unlikely to have gone unnoticed, even if they went unreported!

Contamination

The formal view of most rope manufacturers is that great care needs to be taken to prevent ropes from being contaminated with ANY chemicals. As a general principle, if moderate exposure to the contaminant will harm the skin of a person it should be considered as a risk to the rope. This is not a concept that we recommend teaching as it is bound to be misused. However, it does provide some guidance to expert users.

Internal Damage

The core of the rope is impossible to inspect without damaging the rope. Blue Water ropes have both a thick sheath and a tight sheath. Both of these factors provide a significant mechanical barrier to the ingress of abrasive particles. Action which opens the sheath in the presence of abrasive particles (such as standing on the rope) can permit particles to pass through the sheath into the core. In theory it is then possible for the rope to be destroyed from the inside. We have never seen this with a Blue Water rope. We have seen it in a Kevlar core rope and we have seen it happen in natural fibre laid ropes. I have heard of it in ropes of a braid on braid construction.

There have been a number of brands of rope sold into the rescue market in Australia where the core fails well before the sheath fails. This is normally considered as indicating a very badly balanced rope. If this happens the rope will suddenly get longer (assuming that the force that caused the core to fail does not cause the sheath to fail soon after). The diameter will also be markedly reduced over the broken section of core.

Appropriate training will substantially remove the causes of internal damage. Thorough inspections of the rope are likely to identify 'unusual' sections of rope and in the absence of other signs, core damage should be suspected.

Degradation due to storage conditions

While a rope has a very long shelf life when correctly stored, a number of things can diminish its performance. Many of the known factors are difficult to quantify.

Prolonged exposure to excessive heat will certainly degrade both the polyamide and any surface treatments. How much and how long is hard to quantify. It is worth noting that the dry treatment applied to some Blue Water static ropes and most Blue Water dynamic ropes involves a 'cooking' process. Some treatments are applied to individual yarns prior to the manufacture of the rope and some are applied to the finished rope. The temperatures are confidential but they are well above what we would consider ambient. The rope specifications are for the ropes after the treatment.

Volatile chemicals such as solvents and acids can become adsorbed onto active sites on the polyamide. These can cause degradation of the rope. Ropes simply should not be stored in places where routine exposure to chemical contaminants will arise.

Prolonged exposure to Ultra Violet (UV) light can cause degradation of polyamide fibres. Sources of UV include the sun and fluorescent lights. The sheath of the rope provides a substantial physical barrier to UV and so it is unlikely that UV will cause life threatening damage to a Blue Water static rope. In addition the technology of UV inhibitors has continued to advance and most rope making polyamide fibres have very effective UV inhibitors. Typically partial fading of a bright coloured sheath is an indication of exposure to UV.

Rope transportation while stored is another possible problem. When stored in a vehicle a rope may be subjected to abrasion. Lines should be stored and transported in suitable packs, which will provide protection against contamination and abrasion.

Usage

Prior to putting a rope into service it is strongly recommended that the rope be washed in cold water and allowed to air dry. This action will preshrink the rope (less than 5%) and will increase the abrasion resistance considerably.

We have routinely withdrawn from service our training ropes after a period of two years. This was based on the fact that the ropes had a very hard life (up to 100 days usage per year) and generally were starting to look a bit fuzzy. When we first started this process we had sections of the rope tested for energy absorption and tensile strength. In every case the ropes retained in excess of 80% of the rated strength and withstood at least 2 and sometimes 3 standard drop tests (a new rope withstands 3 and sometimes 4).

Concern is sometimes expressed about taking a rope around tight bends, such as a karabiner. This concern is based on the problems experienced with three strand hawser laid rope, where, around a sufficiently tight bend, the three strands were individually loaded and could thus fail sequentially. We have tested many kilometers of rope in hundreds of knot tests. We have never had a Blue Water kernmantle construction static rope fail around a rod (even down to 9 mm). The knots invariably fail at the point of maximum compression.

In normal rescue usage the greatest risk to the rope is probably a life support line being used for some other task where excessive forces can be applied.

Comments from Blue Water USA

I also have a response from Blue Water USA to the issue of the Edelrid decision to give ropes a two year shelf life. The comments from Richard NEWELL (the CEO) are as follows:

“All of the new Edelrid markings are as a result of the CE Mark. This type of information is required on the new hang tags. The shelf life is to be determined by the manufacturer of the product. In this case Edelrid have decided to make it three years. Blue Water plan to show five years. No one has any data as to exactly what it should be since no long term study has been completed to indicate exactly what it should be. Everyone is covering their rear ends”

We believe that there will be further developments of this issue over time. We are concerned that there will be no incentive on the part of manufacturers to have a long shelf life since their sales of ropes will increase if people are required to replace ropes at fixed short intervals. As both users and suppliers we would prefer some genuine rationality but we suspect that this may be difficult to achieve in the short term.

Conclusion

It is unlikely that any simple time span can be given for the working life of a line. It is perfectly possible to wreck a line on the first use and equally possible for it to survive many hundreds of days of usage. I believe that good training is the key to managing this issue.

Ensure that ropes that have been subjected to treatment that makes them suspect are withdrawn from service, inspected and condemned and destroyed if necessary. Encourage a culture within your organisation where equipment problems are discussed and not hidden.

Ensure that all lines are inspected by a competent person before and after every use. In this way any damage to a line should be found before anyone is required to trust it with their life.

THE MT RENNIE TUNNEL

14TH JULY 2002

BY GEOFFREY MCDONNELL

Participants: G.McDonnell, David and Jarod Perdriau

[In the Megalong Valley near Katoomba, coal was mined under Narrowneck for about 30 years from 1870. The mine works are at the base of Red Ledge pass, about 4 km from the Katoomba end of Narrowneck on the western side. To get the coal out of the valley, a tunnel – the Mt Rennie tunnel – was driven under Narrowneck to join with the pony haulage railway which came from the Ruined Castle coal mines. The railway then passed through a tunnel under Malaita Point to the base of the Scenic Railway – which was a coal railway and not at all scenic back then. Ed]

Eastern Entrance of the Tunnel.

At Malaita point in 1931 the 'huge' landslide collapse effectively buried the tunnel through Malaita point, the other side away from the collapse also being later 'sealed'. However as Mt Rennie Tunnel is STILL OPEN, on Sunday 14th July 2002 myself, David Perdriau and his son Jarod descended at the Golden Stairs (10am) and walked to this area. We passed along to around 1 km away from 'Narrowneck' towards the 1931 'landslide' and arrived at the brown-orange water flow crossing the track from the tunnel entrance! It DID NOT look 'inviting' to say the least! From changing into suitable thermals and wet suit gear at the car (it was raining Sunday Morning!) it must have taken us around 45 minutes to arrive at the tunnel and be ready for entering! Here I tested the 'water' and found it around 40 cm deep (well over the top of my gumboots!). The consistency of this liquid orange mud 'sludge' was indeed 'grim!'

Through the Dry Bit.

Here the Tunnel was 'open' from behind a large sandstone rock (just off the walking track) covering 80% of the entrance and impressive at around 3 m wide and 1.2 m high, with at the start a level flat roof. I led the way forward, bent over and sloshing through the thick orange liquid mud until after some 30 m this muck gave way to a much shallower stream only a few cm deep and also the roof height increased to the point where (in little roof collapse areas of shale) I could even stand up! Of course I was using a caving light and helmet (as soon as leaving the entrance it is a dark zone and NO view of any light at the far end of the tunnel.) and this enabled clear progress along the straight-walled and frequently roof collapsed sections of tunnel.

Around half way through the floor was DRY and the width of two wooden railway sleepers were seen that must have carried the

hoppers which ran on the 2 foot wide tracks. Also seen was a band of a coal seam and no doubt they would have mined out available coal here. It is said that Ponies pulled these hoppers through (but more likely it was cable pulled – even though a low pony could make it.) The tunnel proved also NOT to be entirely 'straight' with a slight curve to the left.

In little collapsed avens about 3 times along the way we found clusters of 20-30 bent wing bats huddling together for warmth and rest. NOT surprising that they were 'hidden' in alcoves as the wind blowing THROUGH the tunnel was pretty fierce! Around 50 m from the end of the tunnel the ceiling lowered to another flat-roofed section 1.2 m high and once again muddy water became the norm as we edged along next to the wall. Soon we were standing up at a sandy slope leading up to a small exit hole around a large sandstone boulder collapse area. So much of this other end of the tunnel was obscured by collapse it looked as if maybe this had even been 'dug out' to gain entry (indeed we had to emerge like cavers out of a narrow entrance to the daylight above).

A Cluster of Bent Wing Bats.

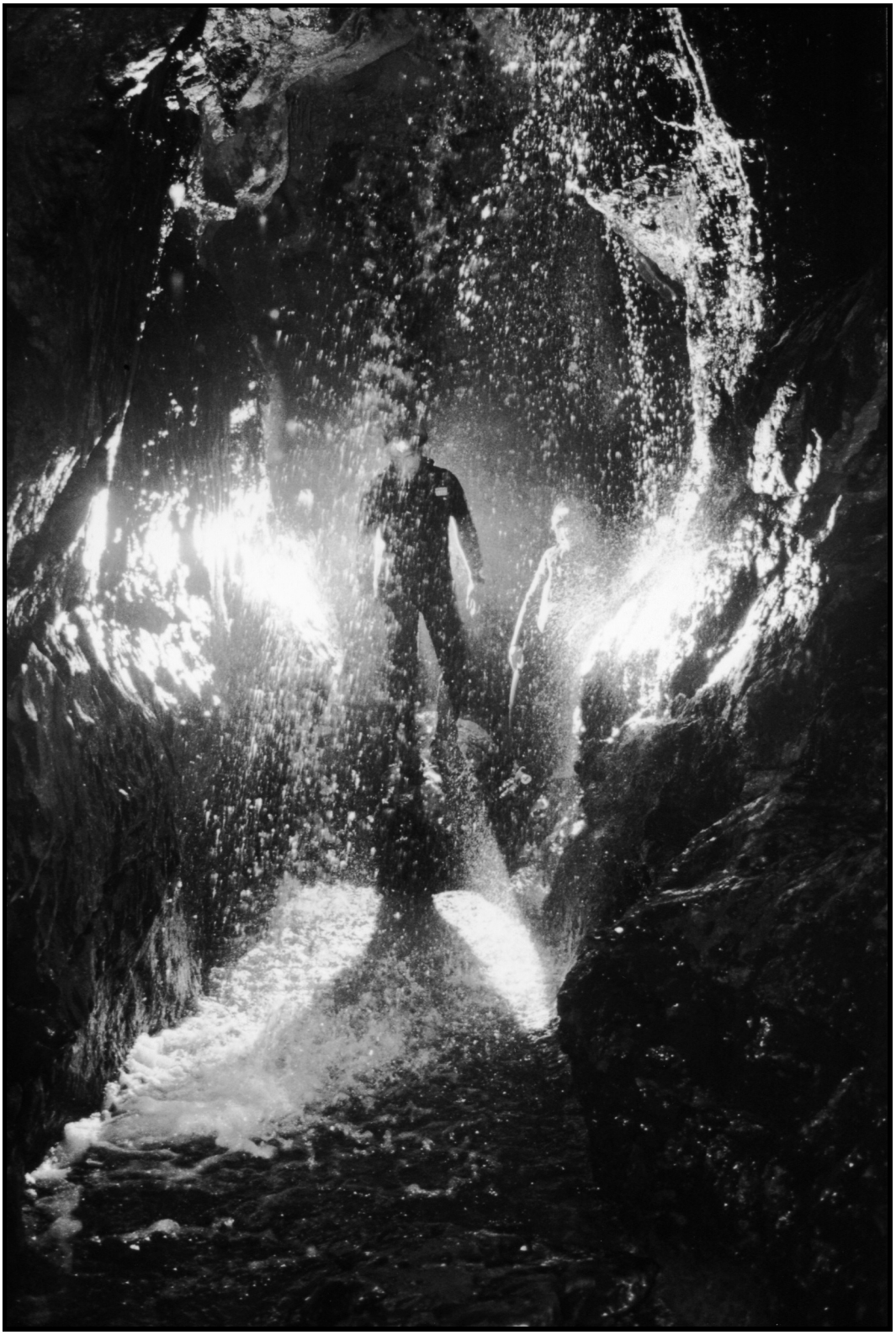
Outside we were CLEARLY on the WEST side of Narrowneck and some 30 m or so above a fire road. Scrambling down we walked down the road until we joined an intersection of 3 roads and continued along again until we reached a T junction with a road labelled 'THE SIX FOOT TRACK'. Here we crossed a bridge over a small river and arrived at the site of an old Glen Shale Mines village (now a grassy paddock for horses). A sign told us it used to be a home for 40 families, a butcher, baker's and a pub! All of this around the 1900's. We continued past this site and walking left towards the now distant Narrowneck followed the old Cable Tramway track ridge towards these old mines before we hit dense scrub and ran out of time.

Returning back through, we estimated that the Tunnel length was around 250 m – certainly no more than 300 m. Also getting nearer the more open end light shone back about 100 m, reflected in the water. The floor seemed to be higher in the middle of the tunnel and lowest at each 'wet' end. Journey through including photos was around 20 minutes – and YES I didn't even get wet above the knees! What I did end up with though was orange-stained legs that later took 3 showers to 'remove' that rusty orange stain!

Having exited the tunnel we picked up our hidden lunch packs and walked 20 minutes to the Landslide area for lunch. Briefly, mid-afternoon was spent looking around for the Malaita entrance to the Daylight Tunnel under Malaita Point, but to NO SUCCESS. Obviously it is buried deep under many, many tons of fallen sandstone rock – as that's all that was in line with the old track. [There are still some old rails and cables near the tourist track here, showing where the tramway emerged from under Malaita Point – Ed]

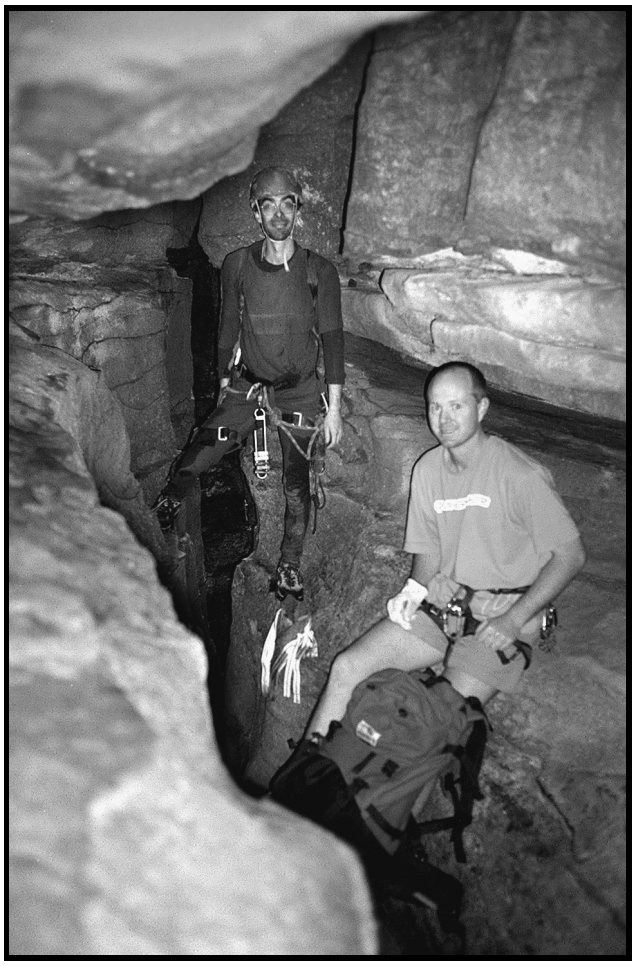
Satisfied we had looked we returned along the track, up the Golden Stairs to arrive at the car by 5.45pm right on DARK. Probably we had walked around 10 km today and it had ALL been very interesting for us. On the Golden Stairs we had actually met an older walker who had done this tunnel many years ago – but she said we would get 'filthy' – well we DID, but only up to our knees in this foul cold muck and it was/is WORTH DOING as an excellent 'historic' day out and an interesting alternate caving experience near Katoomba! See you next time around Narrowneck!

The Western Entrance.



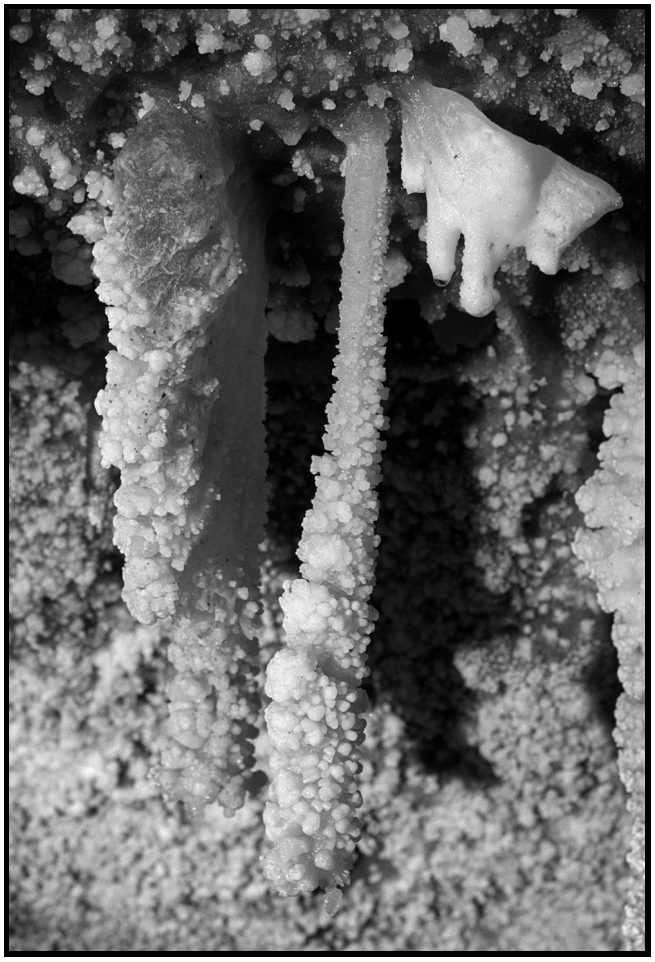
Waterfall in Luckie Strike

Photo David Connard



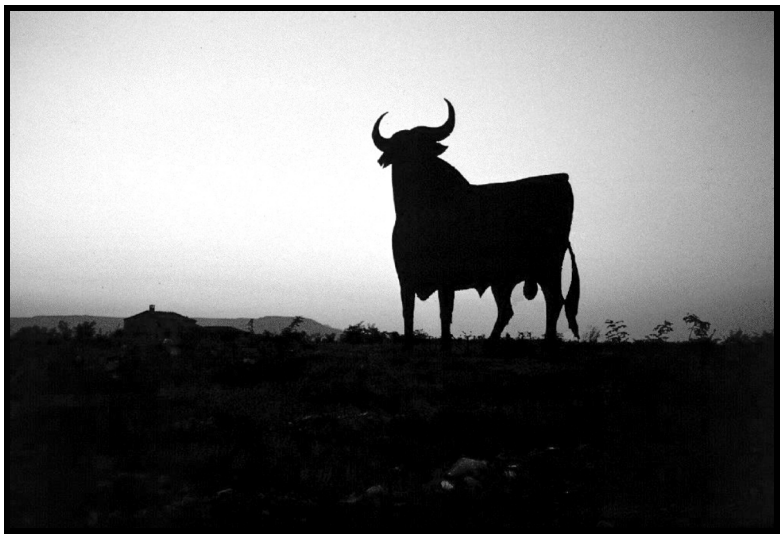
Matt and Michael in Crooked Crevasse Canyon

Photo Alan Pryke



Nice Cave, Wee Jasper

Photo AlanPryke



The End of the Bull

Photo Al Warild

TRIP LIST: OCTOBER 2002

SUSS General Meetings are held on the first Thursday of the month at 7:00pm (for a 7.30pm start) in the Common Room of the Holme Building at the University of Sydney. The Holme Building is close to the Parramatta Rd footbridge on the northern side of campus. The Common room is on the first floor (enter from Science Rd).

For updates to this list, check out the SUSS Website: *http://ee.usyd.edu.au/suss*. Detailed information on each caving area (plus other useful information such as what you will need to bring) can be found in the *Beginner's Handbook* section of the Website.

Please Note: it is YOUR responsibility to inform the trip supervisor of any relevant medical conditions which may in any way affect your fitness, such as asthma, diabetes and the like.

October

5 – 7 Jenolan. Get stuck into that project work over the long weekend. Contact Verity Morris on 9565 5927 (h).

5 – 7 Yarrangobilly. What a wonderful area to go caving. Make the most out of the long weekend and head to the Snowies for some caving. Contact Annalisa Contos at home 9557 9475.

12 Annual Caver's Dinner. Grumpy's Pub at 590 Canterbury Rd (corner Duntroon St), Hurlstone Park. Contact Joe Sydney jsydney@choice.com.au or 9875 1887

12 –13 Walli. Geoff McDonnell leads a trip out to the wonders of Walli. See multiple false floors, do a bit of abseiling and generally have a good time. Contact him on 9385 2077 at work or by e-mail. g.mcdonnell@unsw.edu.au

19 – 20 Narrengullen. Captain Norton sets sail on the seas of Lake Burrinjuck (if there is enough water). To join in ring him at home on 9959 3613.

26 – 27 Canyoning. Martin kicks off the canyoning season – Brrr. If you're interested contact him on 9713 9460 at home.

November

2 – 3 Jenolan. Those monthly trips continue, so if you want to visit this popular area put this date in you diary. Contact Phil Maynard 9908 2272 (home).

7 General Meeting.

9 –10 Bungonia. SRT Training. Own gear required. Contact Annalisa Contos 9372 7898 (w) 9557 9475 (h)

9 –10 Canyoning. Yarramun fun! Exploratory weekend canyoning trip involving swimming with overnight packs (wetsuits and drybags essential) and abseils to see some remote canyons. Contact Phil Maynard 9908 2272 (home).

16 –17 Tuglow. A classic streamway cave with a wonderful campsite. Contact Richard Pfeil 9713 9460 (H).

17 Canyoning. Family Trip. Contact Annalisa Contos 9557 9475 (h).

23 – 24 Kanangra Main. A classic trip. Previous abseiling experience essential. Phil Maynard 9908 2272 (home).

30 –1 Colong. Alan is at it again. If you want to help out on the surveying contact him on 9524 0317 (home).

December

5 General Meeting.

7 –15 Jenolan. The Christmas Party is running on Saturday 7th so put this date in your diary now, followed by a week of glorious caving.

14 –15 Wombeyan. Relax and swim in Mares Forest Creek. Contact Phil Maynard 9908 2272 (home).

21 Butterbox Canyon. Get into a pre Christmas canyon. Michael Fraser Phone (home) 9746 9782.

27 – 2 Jan Canyoning on the Newnes Platau. Spend the best of the summer holidays camped on the ridge and doing some great but otherwise hard to reach canyons including Banks and Luna Park. Contact David Connard on (9428 1608) (h).

January 2003

18 Jan - 2 Feb Waitomo, New Zealand. Two weeks of glorious caving. You've all seen the photos in previous Bulls – and if you haven't been there, it's time to go... Contact Annalisa Contos 9557 9475 (home).