SUSS BULL 46(2)

JULY — SEPTEMBER 2006

Lumen in Tenebris

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Bulletin of the Sydney University Speleological Society

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PO Box 35 Holme Building, Sydney University 2006

Cover Photo: **Entrance shaft of La Ang Khveng, Cambodia. Photo Andy Herries**

NEWS AND GOSSIP

Rho Hole: Sept Trip

This month's trip saw Alan take photos for The Australian Newspaper [*See over. ed*]. Alan was keen to get an article up for the paper. Struggling around with the work camera gear was a bit awkward, but some nice images were gathered of Megan, Felise, Deborah and Tina. Michael was in there somewhere, too.

Megan had another go at the Rhotisserie lead, and reported that the going is getting harder.. Far Country is very close now.... but no connection yet. A very sweaty Andrew Trafford made it to the Rhotunda and marvelled at the delights therein. Felise Fraser was shoved up an awkward lead above Rho's Roy's streamway, but encountered muddy walls, and retreated. There was a breeze up there, so it may yet go, but will require some sort of protection from any falling mud, as below the lead is a hole to the base of the Rhotunda. The tinyest amount of muddying here would be unacceptable. Meanwhile, Michael Fraser had a go at the vertical lead on one wall. He got up about 10 metres or so, but encountered a dead end, festooned with helictites. Michael then had a look at the other lead 'Acrhobat Aven', but as it was getting late left it til next time. The group were all back at the hut by 9:30PM.

Sunday: Alan returned to the cave with others that had not been in the day before, to do a bit of easy surveying in the older part of the cave. After a bit of fiddly survey, we found a small hole leading on into darkness. We were too large to fit – except for Nina, who was despatched into the void after enlarging the hole slightly. Nina reported back large rooms, which turned out to be Ian Carpenter cave. So now there are three separate ways through to Ian C. cave. Only 15 m of survey done, and still more to do here! *Alan Pryke*

Dogleg Climb

Idn chamber is at the back of Dogleg cave, Wee Jasper. There's an old sketch map showing passages running off from the top of a big climb in the chamber, but when we've been there in recent years, no-one felt game to take on the climb unaided. So, on the 5th of August Alan Pryke led a team with scaling poles into the cave – a major effort, as anyone who knows the cave would appreciate! The poles were used successfully by Mark Lowson to climb into an upper level of the cave and over two weekends the passages were explored and surveyed. There was a fair bit more than was known from the old sketches, making for an impressive addition to an already impressive cave. Not so impressive is the damage caused by general access to the cave during the current drought. *Phil Maynard*

Caves, Craters & Critters

26th Biennial ASF Conference, celebrating 50 years of the Australian Speleological Federation. January 6th – 12th, 2007. Mt Gambier, South Australia. Yes, it's back to South Australia where it all began 50 years ago. Come and celebrate 50 years since the first ASF conference was held at O'Sullivans Beach, south of Adelaide. This time venturing further south to the Limestone Coast. Come explore and learn about the Caves, Craters and Critters of the South East of South Australia and help celebrate this milestone.

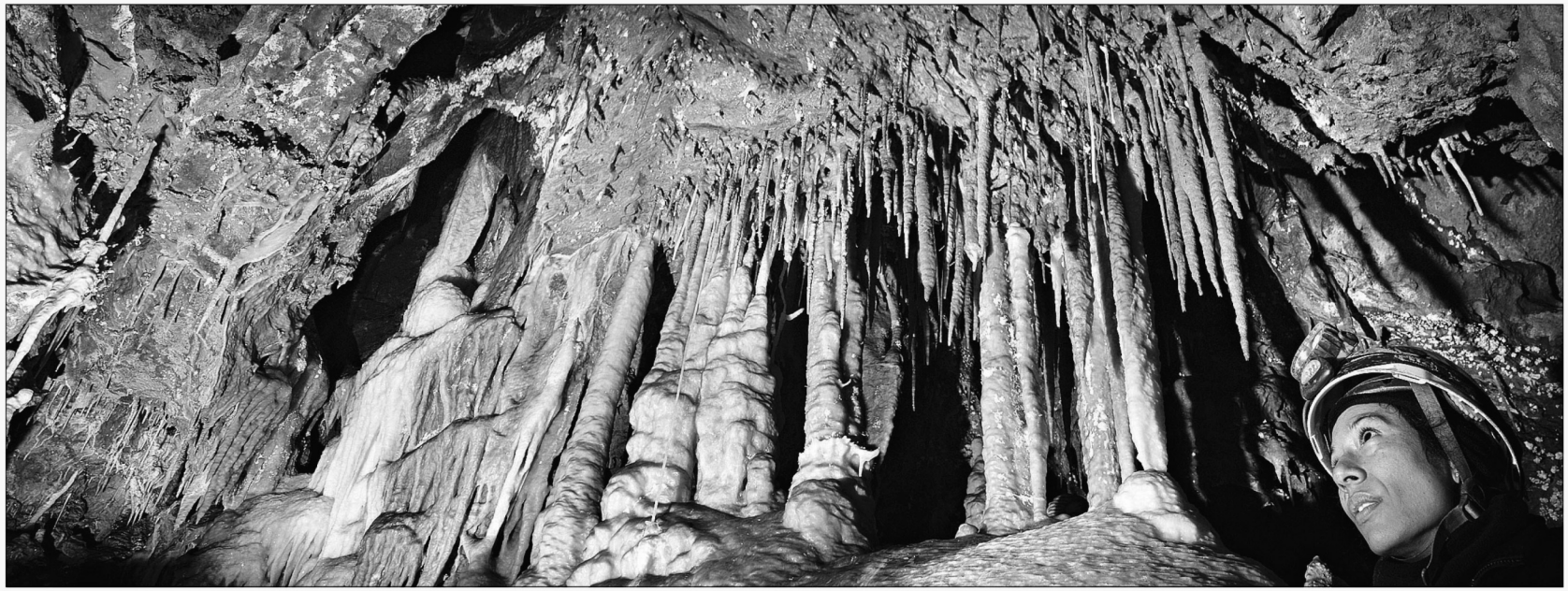
What can you expect:

- A big opening party
- Field Trips to numerous and varied locations
- An Extensive Day trip to Naracoorte caves and all it has to offer
- Interesting presentations on fossils, bats, bugs and everything cave orientated
- Hands on Workshops
- Speleo Sports and SRT events
- Speleo Art and Craft
- Post and Pre Conference Trips
- Activities for Kids
- Wine Tasting
- .....And Much More

Contact: Marie Choi, Conference Coordinator

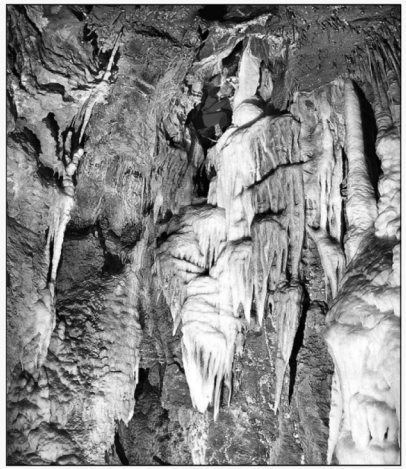
Email: mariechoi@adam.com.au

Huge wonderland found under Jenolan Caves



Awe-struck by the beauty: Caver Felise Fraser of the Sydney University team surveys a highly decorated area called the Rhotunda at the furthest limit of exploration

Pictures: Alan Pryke



Major discovery: Team member in the Rhotunda

John Stapleton
James Madden

DISCOVERING a hidden tunnel that leads to a massive previously unknown cavern is about as good as it gets for a caver.

And when this happens under the nose of millions of tourists at the most trodden-through set of caves in Australia, the Jenolan Caves, it is even more exciting.

Hundreds of metres of spectacular caves have been found by an intrepid team from the Sydney University Speleological Society, the first significant find at the cave system for almost 40 years.

They are hard to reach, but worth the uncomfortable journey. Purple-tinged flowstones and rare red-coloured stalactites and stalagmites paint a vivid underground portrait.

The floors are covered with light-reflecting crystals. Unusually patterned bands of gravity-defying helictites line the walls.

Intricate multi-tiered domes and crystallised streams also form part of the newly discovered network, which is too difficult to access to form part of a future tourist track.

Millions of tourists and thousands of explorers have picked over the cave system since it was discovered in the 1830s, when they were used as a hideout by an escaped convict.

One of the world's leading experts on limestone caves, Armstrong Osborne of Sydney University, said the find filled in significant gaps in the knowledge of the cave system, which was in July named the world's oldest at 340 million years.

''Jenolan is one of the world's most complicated cave systems,'' he said.

''These passages form an important connection between the parts that are used as the show caves, and other parts which are only seen by explorers and specialised caving clubs.

''What is significant is that it is extremely well decorated, with some very fragile mineral deposits and formations. There's some remarkable crystal pools — the floor is covered with calcite crystals which make the floors sparkle. It is very fragile. You cannot walk on it.''

Felisse Fraser, who visited the caves for the first time in July, said she was awe-struck by the beauty of the chambers. ''It was unbelieveable. There was a real sense that you were standing in a sacred spot, witnessing history,'' Ms Fraser said. And although she dared not touch any of the crystals, she said she couldn't help admiring the sparkling features growing from the cave's roof, floor and walls. ''Every woman loves a bit of bling-bling, and it's everywhere. It's gorgeous.''

Speleological Society president Keir Vaughan-Taylor said the find was an ''archetypal discovery''. ''They pulled a piece of rock out and there was this passageway,'' he said. ''We still don't know where the passageways will lead. There is still much more to find.

''These caves take you aback with how spectacular they are. It goes to show that not all has been found in this world, not by a long way.''

Jenolan Caves Trust spokesman Grant Commins said caving experts were astounded by the find. ''The experts all comment on the astonishing beauty of the caves,'' he said.

Alan Pryke, a photographer with *The Weekend Australian*'s and a member of the Speleological Society, said most of the newly discovered passages were extremely tight and the new chambers tortuous to access.

''It is basically an assault course to get to the highly decorated area,'' he said. ''They are very unlikely to ever be tourist caves.''

JENOLAN IN JULY

SATURDAY 8/7/2006 – SUNDAY 16/7/2006

BY IAN COOPER, ALAN PRYKE, MEGAN PRYKE AND MARK STARAJ

Participants: Ian Cooper, Dan Cove, Alison Fenton, Imogen Furlong, Simon Goddard, Hillary Greaves, Tomas Hehnes, Andy Herries, Deborah Johnston, Richard Kennedy, Sasa Kennedy, Steve Kennedy Paul Lewis, Rebecca (a.k.a. Rachel) Lewis, Sarah Lewis, Sharon Lewis, Mark Lowson, Phil Maynard, Megan Philip, Alan Pryke, Megan Pryke, Steve Roy, Kate Russell, James Selles, Mark Staraj, Kevin Welch, Gary Whitby, Jenny Whitby, Tina Wilmore

The mid-year week long trip to Jenolan was planned to concentrate on exploration and mapping of Rho Hole, Mammoth and Wiburds. There was a lot done in these caves as well as work in the Tourist Caves, Water Cavern and a new lead in J168.

Chifley

As part of the survey of the Tourist Caves Phil, Ian, Deborah, and James spent a day in Chifley Cave sketching wall detail. All but a short area between Lucinda Cavern and Imperial Cave was sketched about the theodolite stations along the tourist path. All the side passages remain to be worked on. This project has been 18 years in the making but with new enthusiasm and the driving force of Julia James at least the northern show caves will be done. Map drawers wanted!

Richard Kennedy in the Rhotunda
photo Alan Pryke

Rho Hole

17 – 18 June 2006:

Many people have asked "Did Rho go?" The answer is yes and with surprises.

On Saturday Steven and Megan P. surveyed through the miserable bend at the end of the Rhotisserie. Jenny explored the lead above, but due to the risk of mud falling on the surveyors below Jenny did not venture far. Sometime in the middle of this, Darren had come through the Rhotisserie, needing a pencil to survey the new passage they had just found in the aven leads above. In the end, the other group did not do any surveying that day but had explored options off the rooms above. Garry Whitby's longer limbs were used for some possible climbing leads and one went.

After the climb through a rocky room ("Fair Rho's Tomb") the upper team came to a decorated area (the "Rhotunda") with grey, red, orange and white formation. A place has been designated for removing overalls and boots. Hard spiky calcification makes a pair of soft shoes advisable, or at the very least two pairs of thick socks, with socks turned inside out so that the dirt from inside caving shoes is not transferred on the flowstone. Tina suggested the name

the Rhotunda, and given the ornate nature of the decoration it was a name that pleased all. A flowstone streamway has been coined Rho Roy's streamway. Alan used Darren's camera and got some painting with light pictures. Helictites, crystal pools and many colours adorn the area.

On Sunday, a smaller group returned to survey the newly found rooms. Garry brought in a camera with an off camera flash to take pictures. 120 metres of surveying was completed, the job being about half done.

July, 2006:

We made a bee line for the Rhotisserie, ending up in a human body pile up as Max decided he was too warm in his furry suit. Megan Pryke, Martin and Tina surveyed another couple of legs in the Rhodeo area. Max, Mark and Alan had in the meantime shimmied up the muddy aven. Ascent proved to be awkward due to there being not enough room to bend knees to get higher footholds. Alan assisted Max with his knee and Mark with his shoulder, resulting in a very muddy ear! Alan recounts:

Max: "It doesn't go Alan"

Alan: "Well look harder"

Max: "Wait, there is a small hole"

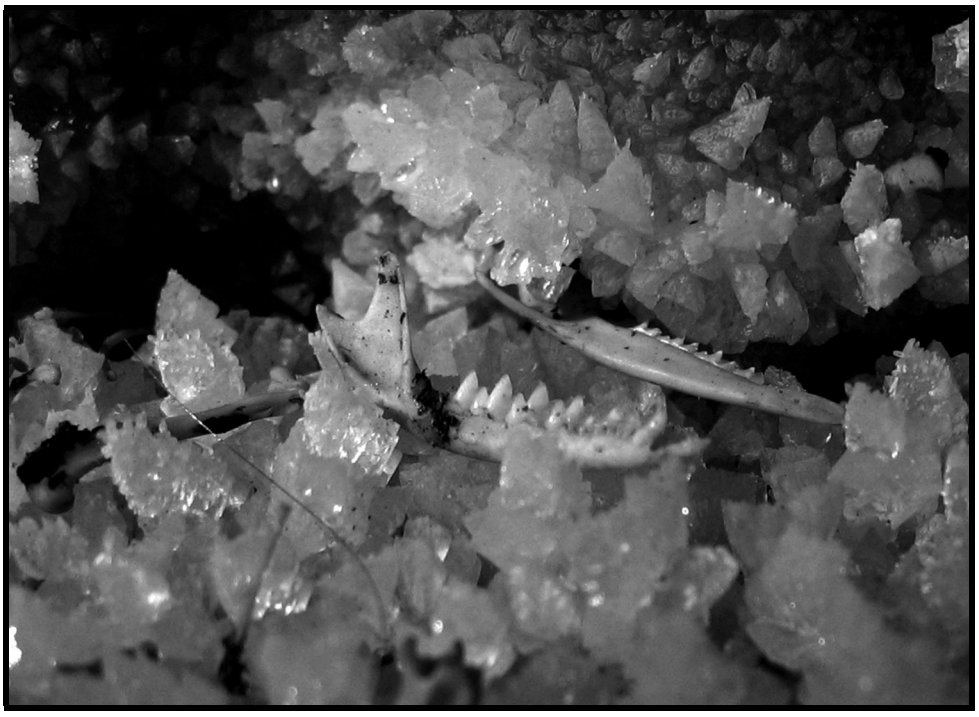
Alan: "Well get in there"

Max had soon disappeared, Mark and Alan following. There were options, all too soon explored as they did not go far, except for of course the tightest one, lined with flowstone and having a crystal floor. They detrogged to get around the corner. Meanwhile, Megan P. sent Martin, Tina and Stephen around to the Rhotunda which Tina was keen to take photos of. Sometime during this, the boys up and round the corner had found more passage. There were options yet again, and in what seemed to be Rho Hole's style the smallest option went. Alan sent Mark through into a small room. Mark reported: "There's a tape here". Alan, deducing it must have been the tape left on the climb to the Rhotunda called back, "Which end?" They had arrived at the base of the tape in the Rhoman Ruins.

On the Sunday, Jenny, Garry, Alan and Megan P. returned to survey the new link. The Whitby's disto was great for completing the job. Due to getting muddy, we did not complete the loop down to the Rhodeo.

July 24, 2006:

The following weekend the trip to Rho involved a few more people with the surprise appearance of Jenolan guides. It was to be a long trip that day, the group was kept moving along by those getting familiar with the route. In the Rhotisserie a plastic bag was used to cover a large rock where the weight from climbing over it had started to crack the calcified surface. A clean tape in the Rhotunda helped in climbing up and down. Alan passed through a small gap heading off from the Rho's Roy's streamway. He had brought in a pair of Tyvek overalls for the job of retrogging. After some investigation Alan reported that there was about 15 metres or so of surveying to be done and he would need a hand. Whoever needed to come in would have to put on their overalls again. Stephen and Simon volunteered and others assisted with collecting and transporting their dirty gear.



Bones in the Rhotunda
photo Alan Pryke

Megan knew it was going to take the surveying team some time and decided to have a look at a lead that Alan had described, with Alison and Dan. It was in the room above the tape climb that I heard Alan's voice quite clearly. The closest corner of the room looked too dodgy to consider going near, so I scouted around for other places through the boulders. Alison and Dan ar-

rived, we all agreed that it was not the best route. On the other side Alan tried to get closer; however it was left as a voice connection only, due to the unstable appearance. Alan reported finding an 8 metre phreatic aven above the detrog area which ends in a formation choke, but has a small space running up. Alan returned to complete the surveying work, including detrogging again. He also had a small snappy camera thus time soon went.

Meanwhile after some snooping Megan located Alan's lead that initially looked too tight. The surface was in fact mud which could be peeled away but I found my enthusiasm damped on closer inspection. Alan's team had still not returned so we decided to have another look at the Rhodeo. Alan claimed we had missed a bit on the survey sketch, which we had. I also moved some of the large pebbles that inevitably roll into the tight part of the Rholy Poly squeeze and collected a bottle that had been left there on the last trip.

Alan, Simon and Stephen remained in the cave as Alan had found the way on in the Rho's Roy's streamway. The back of a crystal pool had a small opening with a breeze pouring out. Alan was soon through, and standing in decorated fossil streamway. After 20 m the lead become difficult, so the passage was surveyed outwards, joining it into the Rhotunda. The lead has a strong breeze, and it was found, after some considerable number crunching, to be only about 35 metres from the Sydney Smith section of Jubilee Cave. The Rhotunda section is at the same level as Sydney Smith section.

So Rho Hole has now passed above and south of Far Country and is about 15 m below Alladin Cave. The closest approach of Rho Hole to Far Country is also about 15 m.

Mammoth

Mark S., Phil and Ian and Gary completed the forestry compass survey in Mammoth. High precision survey now exists from the entrance to the top of Guzova.

Hillary, Imogen and Simon started surveying Infinite Crawl. This was completed as far as the junction with North West Passage. Imogen and Hillary did a sporting push of Infinite Crawl and almost reached the U-tube. Hillary found somewhere to turn around (just) and Imogen and Hillary formed a push-pull team to extricate themselves.

Mark S. and Steve K. spent an unpleasant day surveying The Liquidator – a drought-only prospect visited previously only once back in 1994 by David Jackson. The tight bend proved too risky for Mark S. to negotiate with only Steve for support to get out. This snug and muddy squeeze bends at more than 90 degrees and slopes downwards to the start of a 6 m drop. From here a sloppy muddy tube slopes gently downwards for some metres. A 14 m handline was rigged for this. Steve went on and confirmed what David had reported years before. A solo-surveying technique was invented and Steve sent back in a second time. It was plagued by problems with sighting through the instruments (unknown reason) and by a survey tape that detached from its spool. The result, if reliable, is quite intriguing. It would seem to show the stream continuing to head westwards and downwards after the 6 m drop. Although unexpected it does make some sense. To the west is a streamway glimpsed lying some 2 m underneath North West Passage and in particular there is a hole dropping down to water further to the south in The Overflow. This path is consistent with the route taken by Central River from The Overflow through to Central Lake.

Simon and Mark S. spent a handful of hours exploring North West Passage. A relic streamway was discovered and the virgin mud enjoyed. A choke was opened up at one end leading to some previously pushed passage (not shown in the Mammoth Book) and the result is the "Guzaround" which now bypasses the Guzova. The wet dark brown mud is unlikely to make it a popular route.

Further to the south Simon introduced one of our newest and slimmest members to The Toilet Bowl. A tight rift off Oolite Cavern ends in a constricted floorhole. Water has been heard flushing in this hole in wet weather (hence its name) and stones rolled down the hole make a splash some distance below. A oft questioned report from the 1990s says a slim SUSS member succeeded in getting below the hole and found the climb ended impassably in a pool of water. Since Glenn Smith, a notable SUSS ferret of a few years ago could not pass this floorhole there was some doubt about the claims. Rebecca (or was that Rachel?) was sent to find out!

After slipping into the rift she managed to worm her body down into the floorhole from which she reported: "I can't feel anything with my legs". To which her dad replied: "Spread your legs out!" and Simon, rather simply: "Come back!!". With some support it seems Rebecca may soon put this intriguing question mark to bed.

Watergate Sump

The guides told us that Watergate Sump at the end of Jubilee Cave was open. Much to my chagrin the forecast was for rain on the Friday night so there was no escaping a trip to tidy up some of the survey. Steve R., Mark S., Ian, Andy and Kate ventured through the sump which was as horrible as ever. There were 5 cm pools of water in the lowests parts of the sump (also the squeeziest parts!). But under this water is a soup of gravel and mud that has the consistency of wet concrete. There was a minor trickle through the rockpile which caused Ian some concern. A check visit to Watergate Sump on Saturday afternoon showed that the sump was indeed a sump again.

Mark S has drafted the survey for Kaos Korner and The Strange Attractor. The Strange Attractor with its unsurveyed pitches (and unclimbed pitches for that matter!) is definitely the highest piece of cave north of Elder Entrance. It is possible it will yield a new highest point in the Jenolan System.

Wiburds

Work in Wiburds concentrated on understanding River Section and Time Out to complete the map drawing in this area and exploration of the Yawning Gulches rockpile.

Mark S. and Tina spent a day in River Section to clarify the shape of this complex rockpile area. Some exploration undertaken but nothing noteworthy found. Climbing around in here is a dangerous proposition as the walls are often in a partial state of collapse. Piles of dust and rock splinters indicate where not to hang around. The boulder piles on the floor are not stable and often trigger cascades underfoot. Getting back down without an avalanche takes patience.

Mark S., Steve R., Paul, Rebeeca, Sasa , Richard, and Stephen K. spent a day surveying minor extensions in River Section. Mark S. explored an upwards lead in Time Out while looking for a possible new chamber reported by Ian. With so many people Time Out proved exceedingly dusty. J56 was also pushed by both Steve and Rebecca but this promising streamway cave ends just past the rock obstacle in a dry gravelled sump. Dyke Passage was also looked at. Surveying techniques and tips were taught to the group.

Mark S. and Ian spent a day surveying upper levels above Time Out and in River Section. In May 2005 Alan, Ian, and Megan P. found a sizeable room above Time Out with moderate decoration. Despite some searching this room could not be rediscovered. Yes there is still more to survey in Wiburds!

In the evenings Mark S. and Ian were able to calculate coordinates and complete the drawing up of Time Out and River Section.

In December 2005 a group containing Megan Pryke, Ian and Mark L. explored the rockpile to the east of Yawning Gulches and found their way through to previously unknown areas following a streamway eastwards. During the week Ian, Steve R. and Paul spent a day in this area finding further extensions and surveying. There are still leads to pursue upstream in this area. This streamway may connect to J202 or J56. Both of these caves have reached impassable constrictions as explored from the surface.

The week added 130 m of new survey to Wiburds taking the surveyed length to 4880 m. Currently there is 40 m of known passage to survey so we need another extension to get to 5 km.

J168/169 and J170

On a hot day last February Ian Cooper, Alan Pryke, Megan Pryke, and Max Midlen were prospecting on the surface since recent advances in Rho Hole have inspired the re-examination of other tagged caves in the area. After some scouting the Duckleg Cave tag (J170) was located. Hoping to find the duck body, Alan went down first, then Max. Max had a sore shoulder and decided that I should have a look.

Duckleg has vertical entrance, representing the thigh, a kink, which is also a mid way resting point or a knee, before it drops down, representing the leg, to a horizontal slot at the bottom, I assume representing the foot. It was a very narrow foot, more like a long skinny, single bone narrowing into a claw than a web shaped foot of a duck. Lying on my side, helmet off, I inched as far as I could in. I could see the beyond a narrower bit, a possibility of maybe on. But unfortunately, I could not tell if this was just a wart on the end of the duck's toe or a whether there was more to the left, it did not seem likely. A mirror on a stick or a digital camera could possibly reveal more. The map in the Jenolan blue book was a good representation of the cave and does sort of look like a Duckleg.

The search was on to find J168, a cave that Coops had been to years ago. After some time the group had migrated closer to Rho. It was hot, and given that we had made no progress I decided to look at J169 which I had spotted earlier, I knew nearby there was shade and it was getting past lunchtime. I bent down to have a close look at J169, ripping out offending nettles, it was only then that I felt air conditioned air pumping out. Max arrived and agreed that it was promising noting the gently waving vegetation. Alan arrived, and within 5 minutes he was down into darkness. Max went in next, and then myself. By the time that I got in, Max and Alan had found another entrance higher up. It was the elusive J168 we had been looking for earlier. Ian confirmed this, but at least J168 now has a slightly easier entrance.

J168 has an interesting tale. Many years ago, Rolf Adams, a daring young micro-bod caver, had gone through a tight rift in J168, so tight that it took hours to get him back out. You could understand the rift's potential as beyond is a view of a larger chamber. Rolf got out eventually by rigging tape for a foot hold and having others pull him through – the thought of this makes me say Ouch when I think of the size of this rift.

Alan looked at the rift with much determination and the full knowledge that it should not be attempted. To the

right of the rift he noticed a place containing rocks that were not as well packed as the solid walls of the rift. Alan figured it may be way around the side of the boulder that formed one of the walls of Rolf's rift. Upon inspection and discussion with Max, they soon set about establishing an alternate route. In only an hour, we were on the other side of Rolf's rift. If only Rolf knew that! However, perhaps the large amount of rock redistributed could have posed other threats to Rolf. Without the anxiety that Rolf had about getting out, maybe we would find more. Ian recalled from Rolf's report that there was another chamber and then the leads had petered out. I passed down to the next part, putting aside rocks that had rolled in to the way on. At another tight bit a large rock required just a tad of moving before entering. Meanwhile, a lot of rock crashing behind us indicated that Alan had arrived. Alan thought that we must be thundering through the cave and was surprised to find us not much beyond the first room.

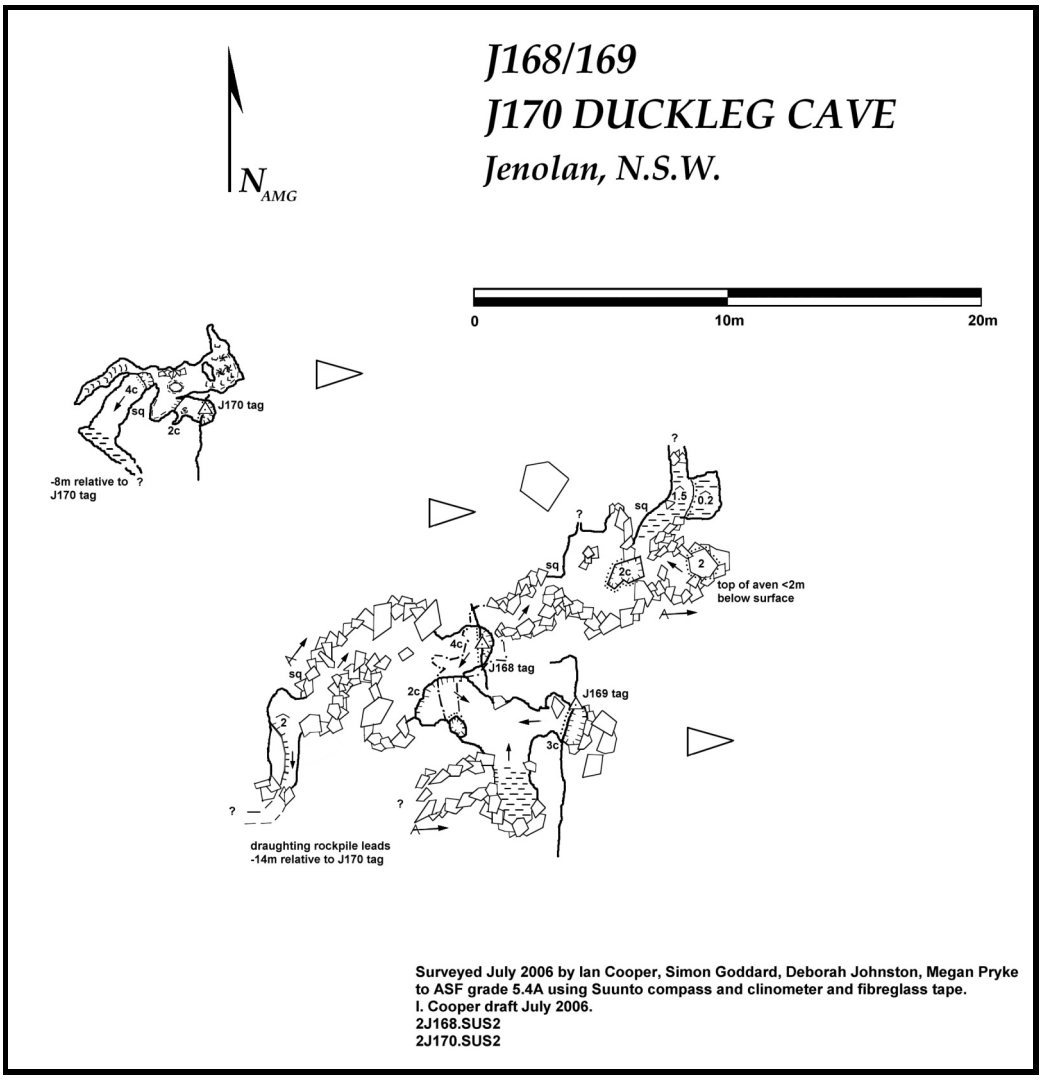
After Max completed his handiwork we could pass comfortably feet first through a sideways squeeze into a small chamber. A pile of dark earth indicated an aven above. It was too much stress on the shoulder muscle for Max to wiggle up, so I went up as Alan and Max peered into a potential choked up way on. The aven went up 7 metres, with a tight part and a slight kink half way up. From the top I could stand and peer into a terminal end another 3 metres higher. I knew that Rolf must have tried this – the foot hold had been used before and the dirt had signs of some prior disturbance. The February assessment was that there were better prospects (in Rho Hole), but J169-168 is certainly not a microbod cave any more.

Now fast forward to July. Ian and Simon decide on an easy day's caving – surveying J168/169 since it bears little resemblance to the existing map. As we surveyed two things become clear; the lower lead in the cave (explored in February) heads northeast and comes back towards the surface and that there are two draughting rockpile leads heading WSW into the hill towards the tourist caves. Simon and I warmed to the task and pushed leads in the lower part of the cave. These leads are probably all dead but there is a rock choked rift in the northernmost part of the cave that warrants another look. The survey shows that the aven in this area reaches to within 2 metres of the surface.

A couple of days later Simon and Imogen spent a day pushing the draughting rockpile near the J168 entrance. The rockpile was penetrated for about 10 m with the lead continuing. The rocks are partially coated in moonmilk indicating airflow from a cave further into the hill. A constant cool draft out of the cave has been detected on all recent visits.

On the last day of the trip Alan, Megan P., Deborah and Ian went back to J168. Deborah and Ian surveyed J170 to get this cave's position whilst Megan P. and Alan further explored the rockpile in J168. Most the new rockpile passage was also surveyed.

Examination of the new map of J168/169 shows that this cave represents a collapsed fossil inlet to the Jenolan Show Cave System. Both of the prospective rockpile leads are converging and are close to connecting. Exploration to the west is likely to lead to upper-level parts of the show caves.

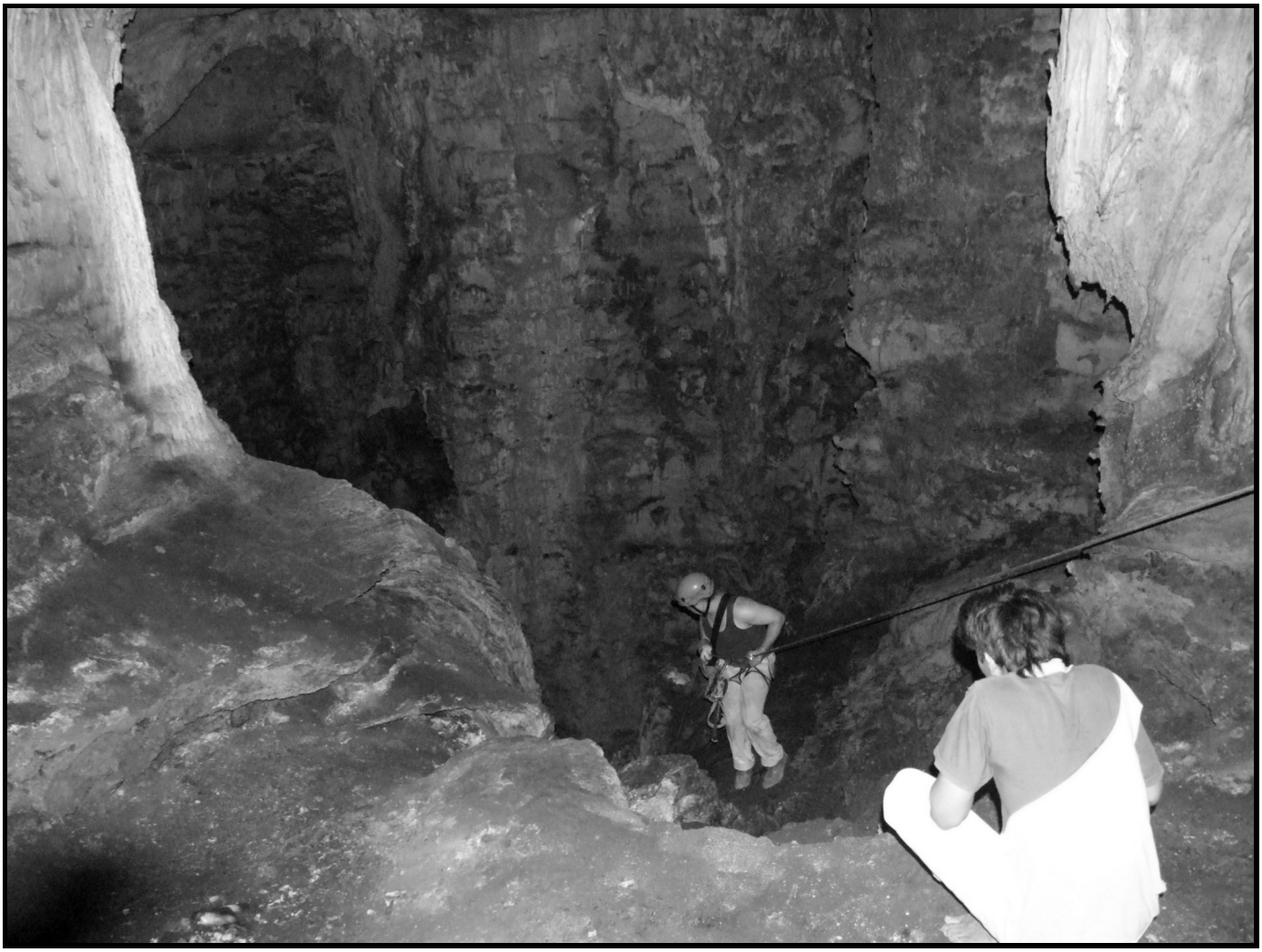


EXPLORATIONS IN CAMBODIAN KARST

Battambang Province, North West Cambodia

by Andrew Herries

Participants: Andrew Herries, Sam Player



Second Pitch of La Ang Khveng, Phnom Sampeau

photo Sam Player

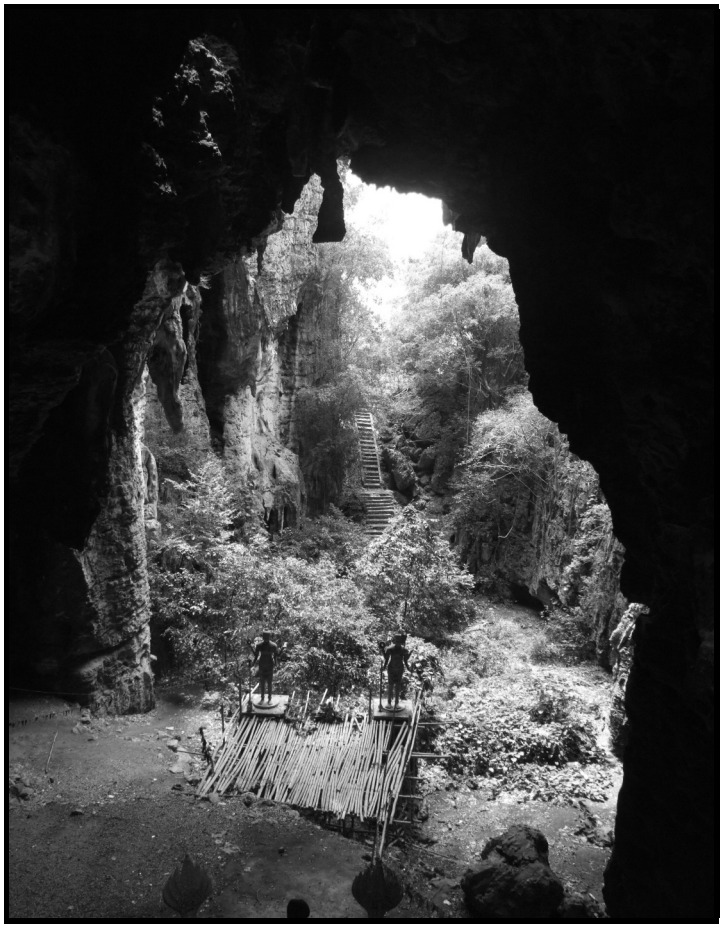
In April 2006 I was invited by the Greater Angkor Project at the University of Sydney to explore the caves and karst of Battambang Province, in north-west Cambodia. The expedition consisted of myself, a graduate student from the University of Sydney (Sam Player), a local taxi driver from Siem Riep (Tung) who came as a translator, and a driver from a local tourist agency off whom we rented a beat up old pick-up. The aim was to identify speleothems that may provide a palaeoclimatic record covering the period represented by the occupation and decline of the archaeological site of Angkor Watt. Unfortunately, the majority of speleothems that were found were very ancient and relict. Small quantities of active speleothems occurred in a few caves but they were too small for palaeoclimatic analysis and consisted mainly of small stalactite straws and nodules.

While landing at Siem Riep airport the flatness of the landscape sent out warning signals about the potential for caves in the region. It turned out they were on the other side of Cambodia, some six hours drive away, but as I am now accustomed to this being the drive to most caving areas in Australia this held no real fear. Problems began almost immediately, when the man at customs decided I was obviously some kind of terrorist suspect, not that unreasonable considering my passport photo. He didn't appear to understand the fact that I was English, lived

and worked in Australia and had come to simply visit Cambodia, travelling via a very nice hotel airport in Kualar Lumpur. After half an hour or so I finally wore him down and I was let loose on Siem Riep.

On leaving the airport terminal I was immediately accosted by a few hundred people wanting to give me a lift to the best hotel in town (all different) by a variety of local transport methods, bike, tuk-tuk (a Cambodian rickshaw), taxi, bus, donkey. Despite my mountain of caving gear laden luggage the bargain basement ride was a dollar (US that is, even ATMs give out US dollars here!) and the driver assured me that with me holding on for dear life at the back and my smaller rucksack shoved between his legs, he could transport me and my luggage safely. Abandoning all sense and wanting to get into the moment I accepted and after a few wobbly starts we were off. Despite the huge weight trying to pull me back off the bike it was rather comfortable and I only worried about stopping safely. Luckily there were no red lights to contend with. On arrival at the Red Piano guesthouse I was escorted to my luxury room and made to feel all incredibly colonial, especially when I went out to eat later. Apparently I was the first to arrive, but I was assured the others were coming. I had not met anyone from the trip yet and by 10 pm I was beginning to wonder if they were coming at all. Eventually Roland (the head honcho) arrived and a day later so did Sam, a little delayed. I spent the time wandering round the temples and sampling the local delights. The drive from Siem Riep to Battambang is a hellish 6 hour potholed one, especially in a beat up old pick-up with very little seat padding. Only occasional stops for coconut rice cooked in bamboo made the journey survivable. On arrival we checked into the local communist-looking hotel and were escorted to the roof top, penthouse suit, giving wonderful views of the city, but distinctly lacking in drainage when a storm came through a few days later. But at least it had a wonderfully powerful air conditioner to keep the oppressive heat and humidity at bay.

In total, around 14 caves were explored in the region to the south-west of Battambang. Numerous small caves occur in the various hills (Phnoms) that scatter the all-but-flat landscape. However, the majority of these are relatively small and consist of heavily eroded, relict systems that consist of one or two interconnected chambers with a few small passages. The caves all show evidence of phreatic solution of the caverns with minimal secondary vadose action. Vadose action is limited to secondary modification of shafts due to water percolation and runoff. The location of many of the caves on the summit of hills means that the caves have a limited catchment area. During the wet months the caves fill with small pools. Spongework like morphology suggests solution by slow moving phreatic waters below a watertable and later solution by water rising from depth. Small chert nodules occur within the dolomite.



Diamond Cave, Phnom Sampeau
photo Andy Herries

Many of the caves have similar local names, derived from the same myths and stories, mostly to do with crocodiles falling in love with young beautiful princesses, as they do! Our efforts at bush bashing were limited due to the constant fear of having to "throw ourselves into the air and scatter ourselves over a wide area". While we were assured that there would be no landmines in the areas that we were going to, a short read of the Lonely Planet guide book, which proved very useful for once, told us that the area was one of the most heavily mined in Cambodia and not to stray from the path! This was mostly due to fighting between the Thais and the Khmer Rouge in the region. Many of the Phnoms we were exploring had been used as defensive positions by one or other side at one point. However, the fact that a few of these were tourist locations helped to reassure us that they would have been cleared of mines and we didn't see too many people wandering round on crutches when we got there.

Phnom Sampeau

The first area that was explored was Phnom Sampeau (aka Sailboat Hill), which consists of two small connected hills of limestone and lies 18 km southwest of Battambang on the NH57 road to Pailan and the Thai boarder. The hill has an imposing limestone cliff-face seen when approaching from Battambang on the rough dirt road and the

Khmer Rouge Killing Cave, Phnom Sampeau
photo Andy Herries

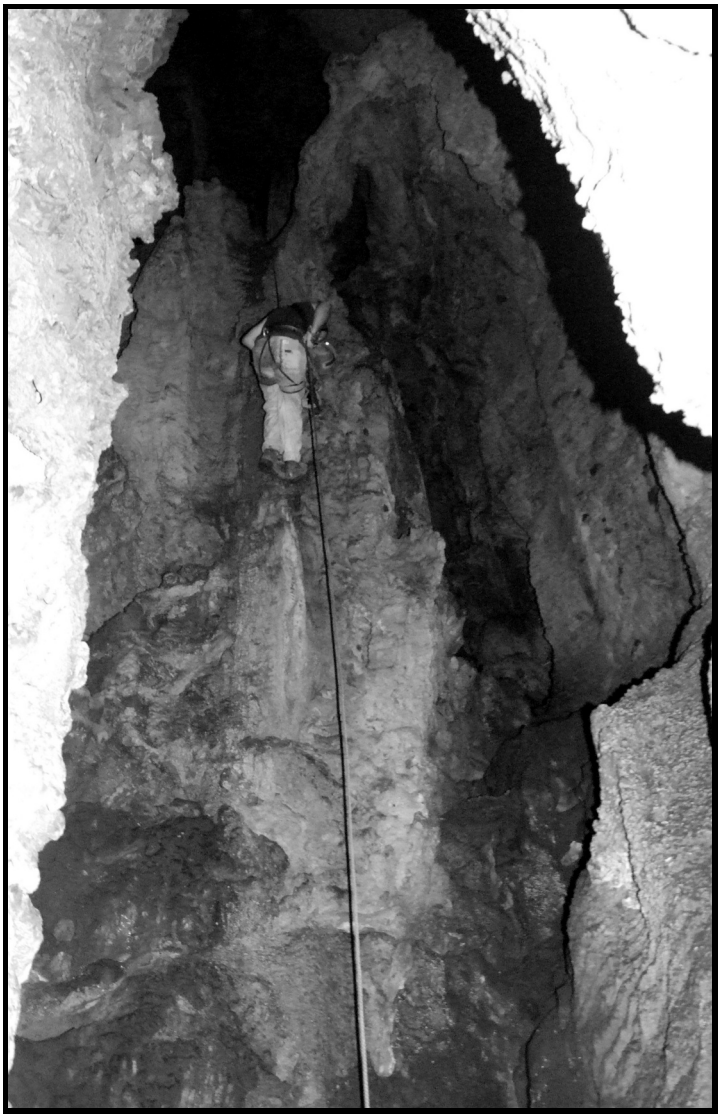
horizontal entrances entered down steep rubble slopes. All 3 caves are very short; the largest has had its floor concreted and contains a golden reclining Buddha. To the left a shallow slope leads to the base of a deep shaft that has broken through to the surface some 15 m above. This shaft is covered by large relict, eroded flowstone curtains. Between this shaft and the Buddha a shallow slope leads down into a low subterranean chamber full of boulders and large, relict and eroded speleothems.

On the southern edge of the eastern hill at Phnom Sampeau another series of caves occur. At the very base of the western hill 3 small holes occur (Diamond Cave) in eroded and relict speleothems. These lead through into a series of steeply dipping rounded chambers. The next cave, La Ang Khveng, is the most extensive cave at Phnom Sampeau. The entrance pothole is 19 m deep and has a ledge at around the midpoint. From this ledge a side rift can be entered that leads to a small chamber with a number of old relict formations. The end chamber is dominated by a large flowstone curtain boss. Around its edges a series of small crystal gour pools occur. The cave can be entered by abseiling the vertical shaft from the large tree that shades the pothole or by climbing down its roots as the locals do. The entrance pothole was once a large subterranean chamber that has broken through to the surface. Numerous large relict speleothems flows occur on the walls of the shaft and date to the period when the cavity was entirely subterranean.

The floor of the shaft is covered in rubble and 5 exits occur. A steep vertical rift leads up to the side chamber that can be reached from the ledge. A short climb leads up into a rounded phreatic tube that soon ends. A small alcove occurs in the southeast corner of the shaft where offerings have been made. The roof lowers

hill is a major religious centre with temples built at both the summit and base of the hillside. The lower, eastern hill contains 3 caves near its summit. These were all used as killing caves by the Khmer Rouge and contain remnants of this violent history. In one of the caves, used by the monks, a large cage holds the bones and numerous skulls of victims of the caves. The people were executed in the local monastery building adjacent to the caves and their bodies thrown into the vertical entrances to the caves. In some cases, peoples' throats were cut and the victims thrown into the caves while still alive and left to bleed to death, often on the rotting carcases of previous victims. In some areas dried blood still smears the walls and remnants of clothing remain.

Most caves have broken through to the surface in a number of places and have 15 m deep vertical entrances, as well as



Base of second pitch of La Ang Kveng, Phnom Sampeau
photo Sam Player

here and ducking under a large rounded tunnel is entered. The tunnel has a mud floor with a fair amount of intermixed guano. Very little roof breakdown occurs and so the tunnel retains its rounded phreatic form. This tunnel ends dramatically in a second 15m deep shaft, the area around the top of which is quite loose. On the left wall a large speleothems column occurs that is attached to the wall. This is covered in a heavily crystalline, modern, but thin calcite covering. Similar thin flows are seen in other areas of the cave but amount to little more than a trickle of reprecipitated calcite. Small clusters of active, very short, stalactite straws occur on the roof in this area. Below these the beginnings of stalagmites occur within the mud or as small, flat, rounded nodules. Another series of these occurs over small older stalagmites at the very edge of the shaft. One of these was used as a belay for abseiling the pitch itself, not being as brave as our local guide, who climbed down the tree roots barefooted. A series of large, heavily rotted speleothem flows occur on the right wall. Between 2 of these ancient flows a side passage is entered that leads back to a small opening on the side of the entrance shaft.

The second shaft drops vertically into a series of large rifts. A short passage chokes almost immediately where a number of small offerings have been made. Back under the pitch and through a rounded narrowing in the rock another passage is entered. This leads gradually up into a series of rounded multi-level mud floored chambers. Large scale rounded sponge-working of the dolomite suggests dissolution under phreatic conditions in a series of fluctuating pools. The dolomite contains numerous small nodules of chert around which the dolomite is preferentially eroded. These nodules act as primary pathways for water with speleothems preferentially precipitating from the cracks eroded around these nodules. In all cases this speleothems is relict and rotted by guano. A series of lower chambers occurs and a larger, single upper chamber occurs. This upper chamber slopes upwards back towards the entrance shaft and is rubble floored. The chamber leads up to a short climb back through a hole into the floor of the entrance shaft. A massive eroded and relict speleothems occurs on the left wall where this upper chamber meets the entrance shaft. Throughout, the roof of the chambers and passages show evidence of phreatic solution.

The higher, western hill contains a large shake-hole system below the summit and a cave in the base of the northern limestone cliff. The system consists of a number of massive open shafts and collapsed dolines that represent a heavily eroded, ancient cave system. From just below the summit of the western hill a large snake hand-railed staircase leads down through a tall rift arch into the base of a large shaft. This cavity represents a huge cavern whose roof has partially collapsed creating the shaft to the surface. In the centre of the cavern, where the roof is still intact, a large bamboo platform has been erected for two statues. Small statues also occur in smaller alcoves around the cavern. In the right wall a low limestone arch leads through into an adjacent open shaft with a number of openings high up on the walls of the shaft. To the right a round passage leads to an alter. On the left wall of this tunnel fluorspar crystals outcrop from the rock where they have been mined out. This fluorspar gives the cave its name, 'Diamond Cave'.

A sharp right hand bend leads after a few metres to a very small round hole in the rock. This small narrow tube leads round a few bends before opening out into a low, wide passage. The floor of this passage is covered in mining debris and has shallow holes where more fluorspar has been mined. To the right the passage soon ends. Old fluorescent lights occur on the ceiling and were no doubt installed for the mining. To the left the passage continues into a low wide chamber which soon chokes in all directions where mining has occurred. The cave contains small white mites (especially in the confined entrance crawl) and huge cockroaches that make the floor appear to move as you walk along. Continuing straight ahead from the snake staircase and out into the open part of the cavern it can be seen that it was once a large subterranean cavity. Relict and eroded speleothems line the walls of the doline and occur on the edge of the current cave mouth. A second staircase leads up and out of the doline on the other side.

The final cave is located at the base of Phnom Sampeau near to where a large Buddha is currently being carved out of the rock-face. A steep 15 m climb is needed to reach the cave mouth beyond which a short passage soon ends. The cave contains lots and lots of bats and was not entered. Three small cave remnants occur in the Phnom So Dong Quarry on the south-east of Phnom Sampeau. These all represent remnants of an ancient cave system that has been eroded away by quarrying.

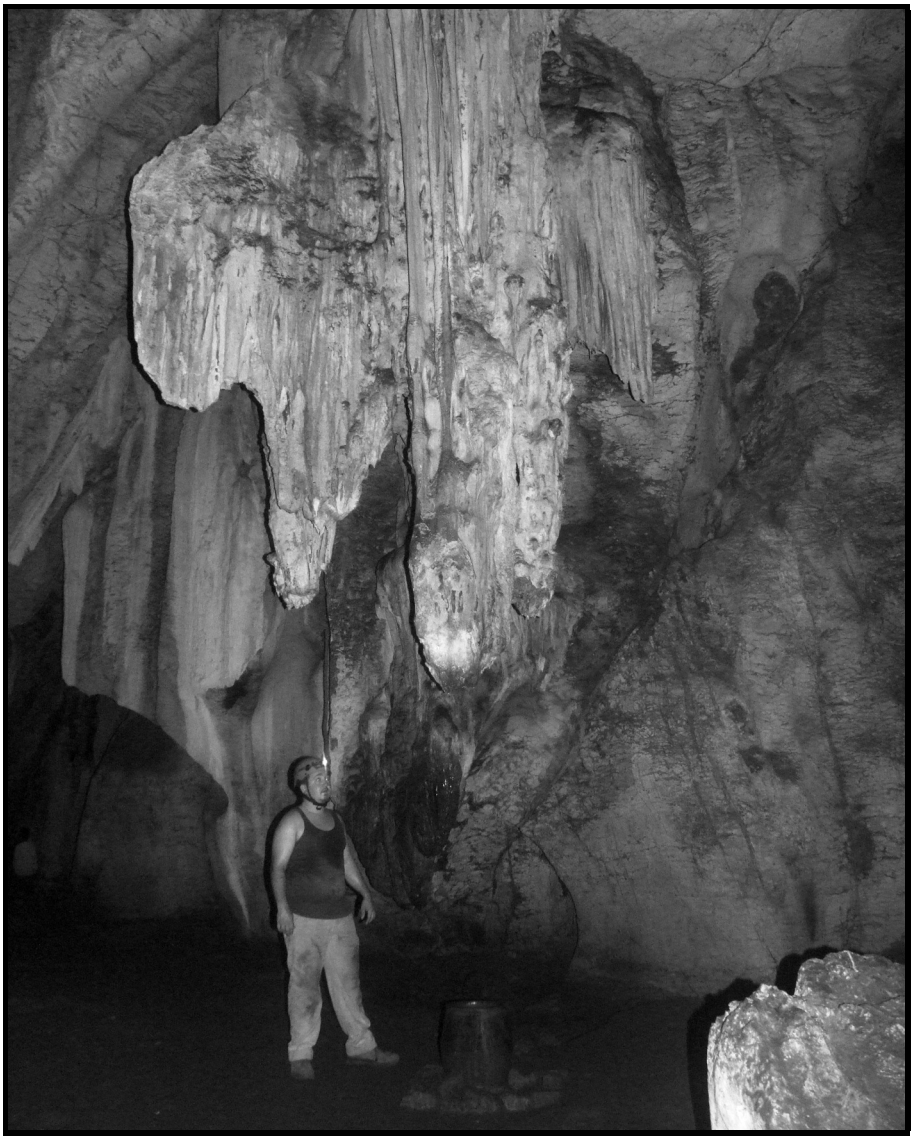
Phnom Banan

Phnom Banan is a small limestone hill at the eastern edge of a small range of hills. Phnom Banan itself is topped by a small temple complex consisting of five towers, Wat Banan. Locals claim the temple was the inspiration for the famous, and much larger Angkor Wat temple near to Siem Riep. The temple was built in the 11th century by Udayadityavarman II, son of Suryavarman I. The hill was used by the government as a defensive position against the Khmer Rouge and was also occupied by the Thais. All the caves occur on the opposite, rear, southern side of the hill from the main staircase up to the Wat. At the front of the hill Laterite outcrops and dips beneath (towards the rear of the hill) the overlying dolomite.

We accosted a small child to show us the caves at the bargain rate of about a dollar. He was very concerned while showing us to the caves that I didn't stand on any ants or while underground didn't bump myself on the head.

Apparently his regard for life was all encompassing. Thai Cave is the largest cave at Phnom Banan and is named after the local legend that the cave went all the way to Thailand. It didn't!

A small rift in the broken rock face leads into a small round chamber. This chamber was obviously once infilled with sediment, remanents of which remain round the edges. A sharp right turn through a short crawl leads to a walking size rift passage. On the right a short climb up into a small upper chamber can be seen. The walls are covered in ancient flowstone. The passage leads after about 30 m to a huge chamber. The chamber is separated into two parts by a massive dividing block of limestone. High up in the ceiling of the chamber the cave breaks out to the surface. The locals told us that this entrance was once blocked by the Thais to stop people being able to climb up through the cave to the summit, defended by the Thai army. The block can be bypassed either to the right by a low, short crawl or on the left by a narrow rift. This brings you out into the larger section of the chamber that is dominated by a massive stalactite flowstone that drapes down on its left edge. The 4 main ends of the flowstone drape are covered by a series of small stalactite straws in an early developmental stage. A small straw was sampled from the end of this drape. The walls are also covered by large flowstone drapes. Water drips off the lowest end of the large stalactite and into a large bowl on the floor. This is the most active cave of any explored at Banan. The entire cave is covered by a solid, flattened mud floor.



Andy in the main chamber of Thai Cave, Phnom Banan photo Sam Player

To the left the cave leads round a small corner to a slope where a number of offerings have been made. A short climb leads up a flowstone slope and into an unexplored rift from here. Straight ahead from the large stalagmite a short, and lowering passage is entered. It is this passage that was pointed out to us as being the way to Thailand. The kid who showed us the cave told us that the Thais had sealed the way to Thailand with a concrete barrier, which has since been broken. The barrier he showed us was a natural false flowstone floor. Up over this floor the passage continues through a small round hole. The passage soon ends and a short climb up ends in a rounded solution tube. Through the hole and back underneath the floor to the right a small hole leads into a parallel solution tube. Climbing up and over through a hole brings you to the same point. No evidence of Thailand unfortunately.

Buddha Cave was the second cave we were shown at Phnom Banan. A path leads through an entrance area of shattered and fallen blocks from the cliff face on the rear side of the hill. The entrance to the cave is up and over a series of boulders where a wooden staircase has been erected. This leads down through a tall, narrow opening into a large high single chamber. The floor of the chamber has been paved and contains several statues and an altar. The chamber has broken through to the surface at its highest point to create a small vertical shaft entrance. No major speleothems are noted in the cave.

Scorpion cave lies on the opposite hill-slope to the other two caves and occurs in a low and narrow rib of rock that runs in an arc from the main Phnom Banan summit, rather than in the main part of the Phnom itself. As with the other two caves here the cave entrance is at the base of the cliff-line. A series of small entrances lead onto a shelf overlooking a series of lower chambers. The shelf is covered in relict speleothems, both flowstones and stalagmites.

This cave is one of the most well decorated caves in the area. While the formations here appear to be more recent than many of the formations in the caves of Phnom Sampeau they are still mostly relict and many are broken. From the ledge you can either climb down into the lower main chamber directly on the left or you can drop down into a hole on the right. From here a limestone arch leads via a dirt slope into the base of the lower main chamber. A passage leads off to the right from the main chamber and leads into a series of small, low chambers. These passages are again well decorated with both small stalagmites and flowstone curtains. Coralloid speleothems (cave popcorn) also occur on the walls in a number of areas. The coralloid forms show black and red staining from iron and manganese. The short series of passages ends in a shallow flowstone slope covered in small stalagmites.

Phnom Ta Khoeu

Phnom Ta Khoeu is part of the same series of hills as Phnom Banan. The hill is interesting as it is topped by sharp pinnacle karst features. The three caves visited all lie on the northern side of the hill. Crocodile Cave consists of a large chamber with two main entrances. The right hand entrance leads down a short climb onto a small boulder covered slope. This leads to the main flat floor area of the chamber that was used for dancing by the local people during festivals. A relatively thick tree root comes in through the roof on the right and into the floor of the cavern. The farmer who showed us the cave said that when he was a kid the root was not there and has grown since that time.

To the left and under a series of limestone arches the second shaft entrance is reached. Right from here leads via a rift back into the rear of the main chamber. A series of breccia deposits occur on the edges of the chamber but with no archaeological or palaeontological remains. A thin root drapes out of a hole in the flat roof at this point. The hole is a long solution tube that appears to lead up to an overlying cave that must also have an entrance as light can be seen. The tube could not be climbed as the hole is on the ceiling of the cavity. A number of small stalagmites also occur in this area but are relict. Many of the speleothems have suffered dissolution. The limestone here is very different from the more dolomite-like rock at Phnom Banan and Sampeau. The whiter limestone that forms the flat ceiling at the rear of the cavern is very different from the chert rich limestone into which the cavern has mainly been eroded. This morphology explains the formation of this large chamber at this contact between different lithologies. Climbing back over large blocks in the centre of the chamber the main flat area near the first entrance is reached again.

Snail Cave is simply a small rift in the limestone that forms a small overhang. The rift is filled with snail shells and tree roots and the walls are covered in coralloid speleothems that appears to have grown in a more open, evaporative environment, similar to tufa. Shaft Pot consists of a choked solution shaft.

Phnom Krorpoeu

Phnom Krorpoeu is a small isolated hill between Phnom Sampeau and the large range of hills that lie to the north west. A monastery containing a small cave with Buddhas lies at the very base on the northern side of the hill. A staircase with snake handrails leads up the hill but as yet nothing has been built on the summit. Crocodile Cave is named after a traditional story about a crocodile that fell in love with a Princess called Neang Keo Rom Sai Sok, who used to feed the crocodile. One day the Princess was to be married. The crocodile became angry about this and while the Princess was feeding him, the crocodile ate the Princess. This story is very popular and many of the caves or hills in the region are named after the story, eg Crocodile cave at Phnom Ta Khoeu. A man at Phnom Ta Khoeu told us about a cave named after the princess in hills to the south that is apparently well decorated.

The cave has two lateral entrances and a small shaft entrance and has concrete on the floor in all but one chamber. A large bat colony is present and bat guano occurs all over the floor. Large cave crickets also occur. The lower entrance is smaller and has paintings of a number of eyes on the right wall. A monk told us that these were about 500 years old and showed that the cave was used for rituals. After the entrance the narrow winding passage leads after about 10 m to a cross junction, where a tall shaft leads up to the small upper entrance. To the right the passage soon ends after 3 m. To the left the cave opens up into a 5 m^2 chamber with a Buddha and steps leading up to a larger entrance. Straight on at the cross-junction leads to a small wooden door after 3 m. The passage turns sharp right once through the door and a narrow, vertical squeeze leads into a small chamber. The chamber shows evidence of a palaeokarstic fill on its walls, now re-eroded into the walls of the chamber.

The monks told us of a second cave on the summit of the hill but said that it was a difficult to reach and contained very little. We visited a range of hills northwest of Phnom Sampeau and Phnom Krorpeau called Phnom Ampeau. The hills are quite low and are sparsely vegetated. The hills have shallower slopes than the other hills in the region. Locals all talked of one cave that was located on the top of one of the hills, but nothing more. We tried to locate this but with no success.

All in all a delightful trip, although I don't think that I have eaten noodles since, especially for breakfast.

KEVIN BARELY MAKES IT THROUGH

MANGAWHITIKAU, WAITOMO

17TH APRIL 2006

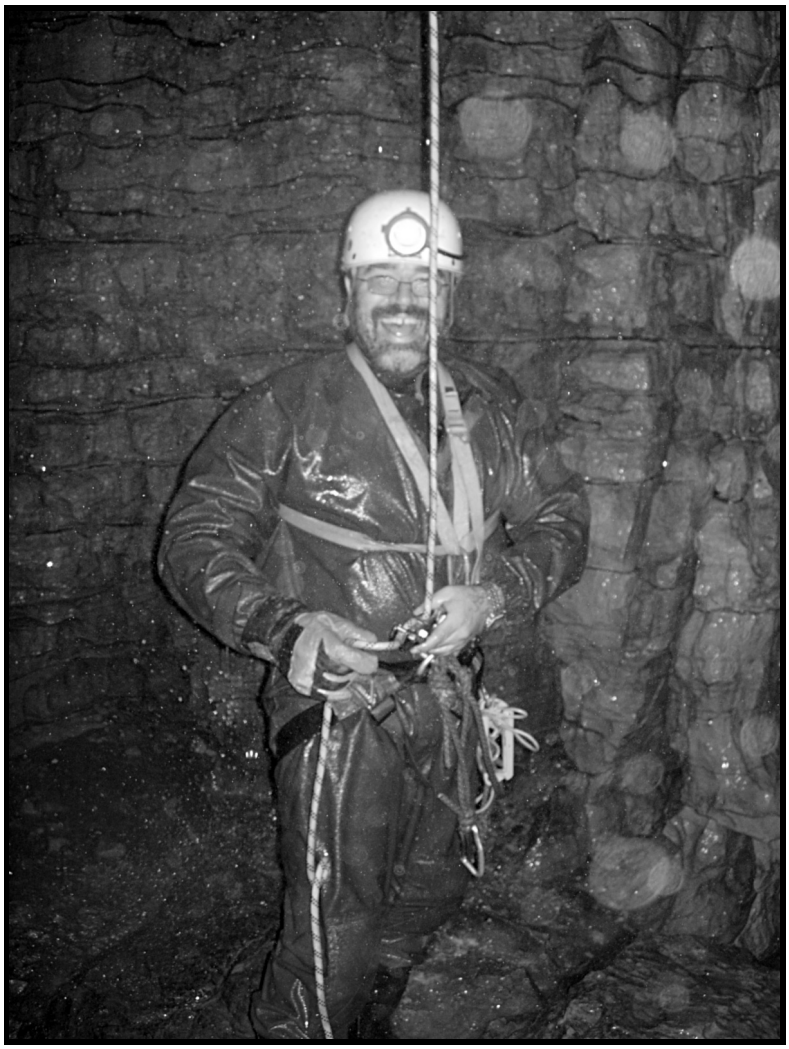
TEXT AND SKETCHES KEVIN MOORE

Participants: Kevin Moore, Michael Fraser, Simon Goddard, Phil Maynard, Chris Norton

Phil had been building up for this cave for months: it was the one he wanted us all to do, but Brett and Simon C had piked regardless, citing such impressive excuses as vertigo, and not wanting to get their feet wet, so Phil wasn't going to accept my infected toe as an excuse. There was a small amount of water flowing into the entrance, but not enough to deter Phil and Chris, so Chris went in to rig the de-odouriser pitch. An interesting start to the pitch, leaning out on a dodgy boulder, but once on the pitch, it was a classic: a beautiful clean shaft with a waterfall, and a dead goat at the bottom of the pitch to add a bit of flavour.

The way on is a nice spacious passage that meanders a bit before being transformed into a nasty tight rifty thing, that was only moderately Kevin-unfriendly, and on getting through Chris advised me that it was the tightest bit of the cave. So encouraged, the climb down to the river was easily managed. At the river, Chris had released Duckie, who was swimming in a pool posing for Michael, who had foolishly brought a camera.

Photographical silliness completed, the magnificent streamway presented itself as the next obstacle. The water was "up a bit" according to the resident sages who had been there before, but the flow wasn't enough to cause any issues, so we blundered on up the passage in water ranging from knee deep to neck deep, climbing over the occasional sculptured waterfall, until we reached a passage heading off to the right. The sages conferred, muttering such pieces of wisdom as "I thought the Grinstead levels were on the left" and "Well, if we get to the sump we'll know we've gone too far".

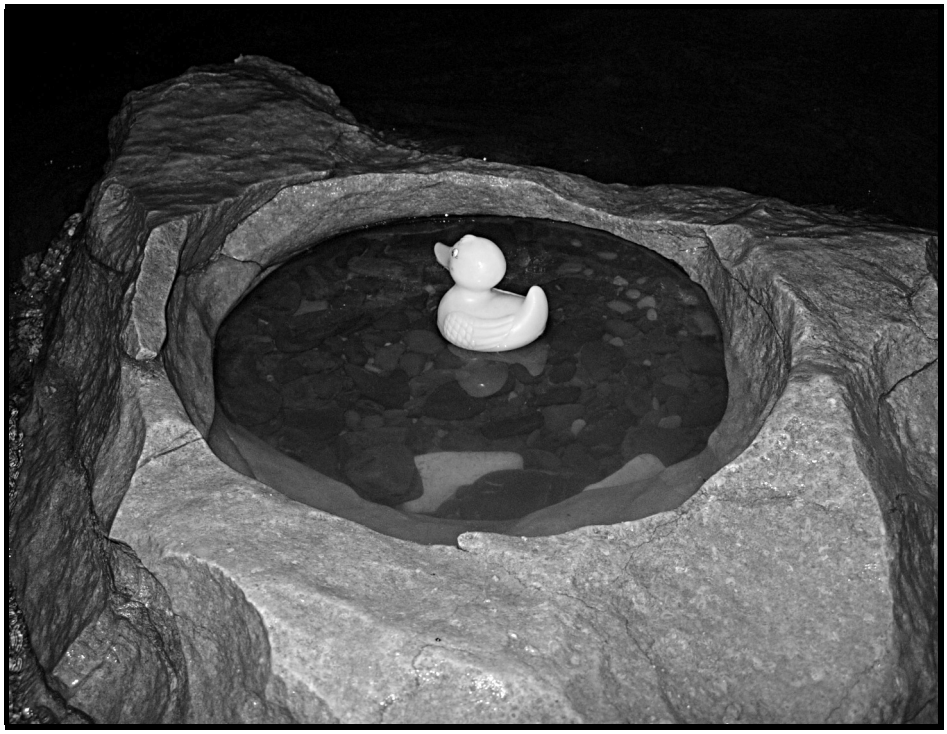


Kevin gets wet in the Deodouriser pitch
photo Michael Fraser

A few hundred metres further along the streamway, Chris returned to the group, announcing that he had reached the sump, and, conveniently, the passage on our left went up to the Grinstead levels. The passage was, as advertised, tight and rifty, and required and 'interesting' climb, but I remained assured that there was nothing too nasty ahead, Chris having assured me in good lawyerly fashion that there was nothing tighter than Gollum's passage, so I'd have no trouble.

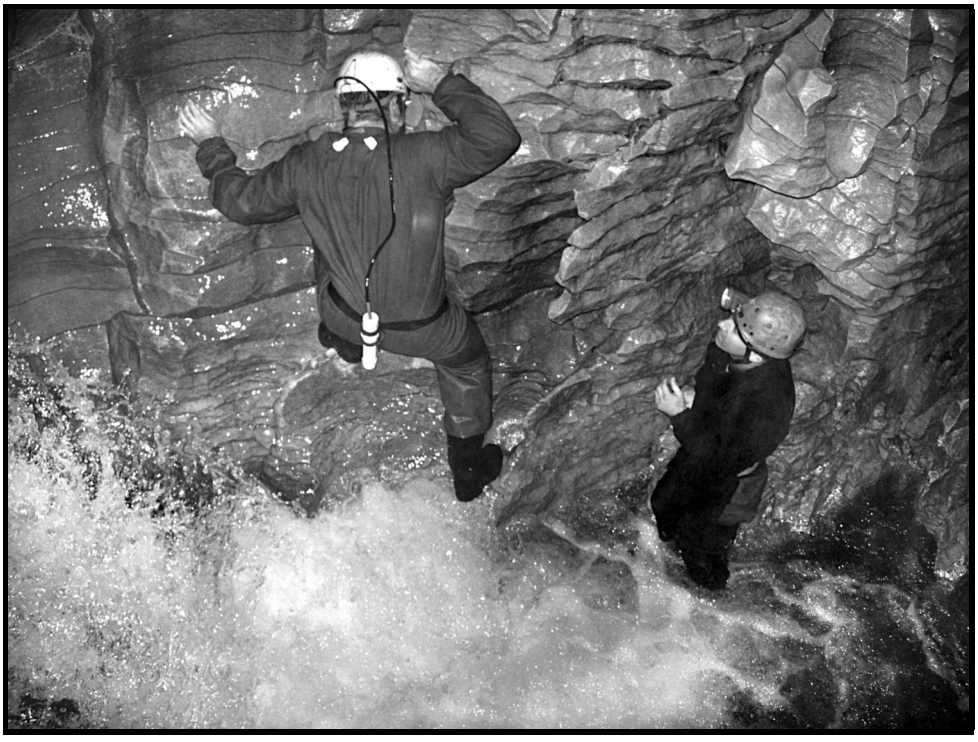
Further into the Grinstead levels, the sages consulted again. "I remember this bit, but I don't remember that stuff at all....." and other such reassuring phrases soon floated back to those of us who were here for the first time. Eventually the sages agreed that this was, indeed the way on and that the extra swimming was due to the amount of water coming into the cave.

After a little more rifty labyrinth, Phil said "I didn't remember this being this tight". Chris said "Ah yes, I'd forgotten about that bit. Kevin's not going to like that bit, is he?" The first I knew of 'that bit' was seeing Simon struggling out of a small slot in the wall. Simon is somewhat smaller than I, so this didn't fill me with confidence. Chris apologised profusely: "I really didn't remember this, Kevin, but... you're going to have to come through here". A couple of tries at various places indicated that I wasn't going to, at least, not wearing a wetsuit I wasn't, and given the prospect of going back and doing the prussik past the goat did not appeal, there was only one thing for it: nude up. Fortunately, my chest is larger than my hips, and I was at least able to retain the dignity of wearing underpants, so with Michael holding my legs at the right angle I dove into the wide part of the squeeze, scraped around a bit, swore a bit, and I was free.



Duckie does Mangawhitikau
photo Michael Fraser

The subsequent passage wasn't too bad, and we soon reached a room where I could put the wetsuit back on before the chimney back down to the river. The chimney looks a lot worse than it actually is: the rock is nice and grippy, and you can wedge yourself into it nicely. Phil belayed us down with a tape, which probably wasn't necessary as it turned out, and it was a decision we'd regret later.



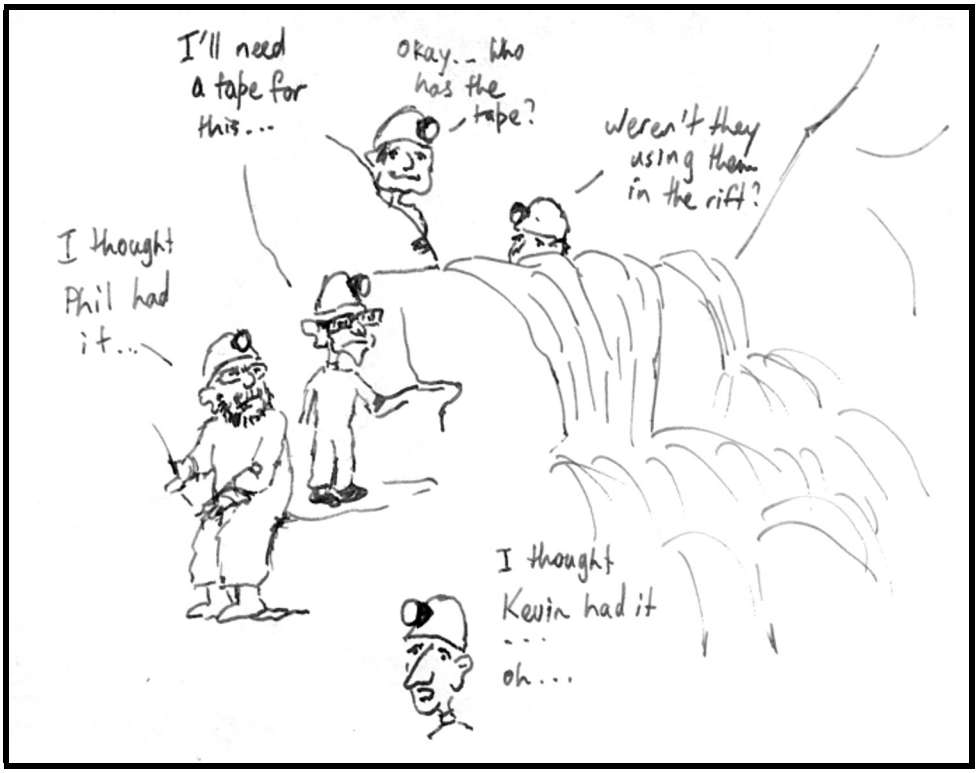
Kevin and Phil get to grips with the river
photo Michael Fraser

Now back in the river, it was more of the Mangawhitikau madness: wading upstream against the current, and getting up the walls in the narrow sections to keep out of the main current, although the clown pants made this difficult. The next obstacle was to free climb a seven metre waterfall.

Chris opted not to use the obvious jughandle on the left, and crossed to the right, under the full flood of the water, and with a bit of a struggle mantled the waterfall and was up. Michael liked the jughandle, and was soon joining Chris at the top. Simon thought the juggy route was better, but wanted a handline so Chris asked who had the tapes that we'd used in the rift. The conversation went something like this:

"Simon wants a tape. Have you got it?" "Kevin has them, doesn't he?" "No I don't. We were using


ARE YOU GETTING A PHOTO, MICHAEL?


I'll need a tape for this...
Okay.. Who has the tape?
Weren't they using them in the rift?
I thought Phil had it...
I thought Kevin had it ... oh...

them in the rift and I left them for Phil to put in the pack." "I'm not carrying a pack. I thought you had them." "I thought you had them." "Oh.... I'll go and get them."

With these words, Phil left to retrieve the tape. While waiting, Simon had been looking at the route, and it didn't look that bad, so he gave it a go, and with a few of the swear words that the Navy teaches youto use in situations like these, he was up. I, feeling guilty about the tapes, decided to give it a shot, and after an aborted effort at going entirely the wrong way, succeeded at the second attempt. Excellent! Simon and I continued ahead so as to minimize the delay, but I was soon caught by Chris, Michael and a tired Phil, who managed to be philosophical about the whole incident.

Phil slowed down to my pace and kept me company for the rest of the cave: mostly a slog through streamway, encumbered by clown pants. Near the exit we ran into a tour group whose guide was showing them a lead up in the left of the passage: later, at the surface, we speculated as to which doline it might have been connected to. The most obvious candidate had a little hut built on top of it, of the kind commonly found in the country.

The final obstacle was before us, the climb out of the tomo, 25 m up the wall, which the tour guide had thoughtfully rigged and allowed us to use. Phil free climbed it, and belayed the rest of us up: it had been well-gardened, but was slippery enough to require a bit of care. We surfaced to a cold sunset and chocolate, grateful to be out and grateful the cave was – barely – Kevin-friendly.

Michael, Kevin, Simon, Phil and Chris at Long Tomo

photo Michael Fraser

KARSTAWAYS IN EUROPE

MARCH 20 – JULY 18 2005

TEXT AND PHOTOS MARK STARAJ

Present: Staraj Clan – Mark , Wendy, Matthew, Claudia.

The rationale for this trip was really to go on a big adventure in Europe lasting as far as the money would go. There is so much karst in Europe you would have to work strenuously to avoid it. We didn't. The trip covered the following countries in order: USA, Germany, Switzerland, Italy, France, Monaco, Germany again, Austria, Slovenia, Croatia, England, Singapore. This article is essentially a scenic presentation of some the better karst we saw plus notes on the handful of caves actually visited.

USA

There were holes of a sort in LA, ranging from Disneyland to LAX airport but it hardly counted for karst. However, underground landscapes worthy of a visit would include Indiana Jones and the Temple of Doom, Pirates of the Carribean, Splash Mountain and Van Helsing (at UA).

Switzerland

The first noteworthy limestone seen was without doubt the massif of the Eiger, Monch and Jungfrau near Interlaken in Switzerland. The ride up to Jungfraujoch from Interlaken is breathtaking scenery rising from around 500 m asl to 3,500 m asl. The highest railway station in Europe and certainly high enough to induce some altitude sickness as Wendy discovered. It was a stunningly sunny day and the air temp. a brisk -10 °C. The breeze ensured no one stood outside for more than a minute.

The Way of the Gods

Italy

The next eyecatching karst landform was the famous marble quarries of Carrara in the Apuan Alps – source of some of the Ancient world's edifices (eg. The Pantheon in Rome) and sculptures including Michelangelo's David seen in nearby Florence. Looking from the train to the Cinque Terre the quarries stood out as giant white bites taken out of the ridges and peaks of the marble range. There are too apparently some quite deep systems in these mountains.

More limestone would have to await until we reached southern Italy – the famed Amalfi Coast to the south of the Bay of Naples and an easy day trip from the haunted ruins of Pompeii. I had no idea we would be spending a week perched on the edge of a massive range of limestone mountains plunging from 1200 m into the sea. I had heard of a 12 km walk between the town of Praiano where we were staying to its more famous neighbour Positano. As it transpired I did this walk solo and it was one of the highlights of a month in Italy. It goes by the name of 'The Way of the Gods' and on this perfectly sunny but cool day it lived up to it.

An extremely steep path climbs an endless stair to reach the San Domenico convent perched high above and 1/2 way up. There had been no signs showing which steep path I needed to go up so after bemusing the locals and walking two extra kilometres it was with some relief I found the steep track which from then on was signposted every 5 minutes of climbing. As I was behind schedule I powered up to the monastery where I took a breather and admired the view. The peaks higher up were shrouded in cloud but as I watched the sun burned these off and left me with a flawless view of this stupendous coastline. The Way of the Gods (Sentiero Degli Dei) proper was higher

Blue Grotto of Capri

up where a limestone bench skirted the higher peaks at around 600 m asl. The bare pavement the track followed was loomed over by mountains on the right and dropped precipitiously into the ocean far below on the left. It clung to a narrow strip in between. This degree of exposure would have been unthinkably dangerous in any bad weather such as high wind, rain or fog but this day it was simply breathtaking. For 3 hours I travelled this stunning route and saw absolutely no one.

Caves could be seen at the bench level, the sides of the ravine on the way up and dropping into the ocean. Also one or more deeply incised canyons. One cave was also a local attraction on the Way of The Gods but in the opposite direction I took (back towards Amalfi). However I have not found any speleo references to systems in this range although it appears there should be something. Anyone want to check it out?

The first cave we entered was the famous Blue Grotto of Capri. Justly famed for the intense blue light radiated from its sandy bottom but more likely for the cost of the 5 minutes spent in it. Poled through a very low opening by our 'gondolier', you float around in the wash of twenty other boats in this 60 m long cavern. If you are unlucky he will also sing. One of those things which you do because you are there. Capri itself is an incredibly beautiful limestone island rearing out of the sea and was the 'playground of ill-repute' for an aging Emperor Tiberius who had a jaded appetite for youths. The Villa Spelunca of Italy, I suppose.

A lovely walk along the seaside cliffs takes one past Arco Naturale (think of Carlotta Arch overlooking a Blue Sea instead of Blue Lake), a cave with a restaurant built into it, and a large shelter cave (Matermania Grotto) containing some Roman ruins.

France

Subject of recent lengthy, entertaining and illustrated articles in the SUSS Bulletin it would come as no surprise that there are remarkable caves in France. In three weeks we didn't see any of them. However we did visit a museum in Avignon featuring nearby Fontaine de Vaucluse. And we did photograph domesticated caves in Amboise.

Austria

Overdue for a proper cave – Austria was the tonic. Based in picturesque Salzburg it is but a short distance away to visit one of the premiere tourist cave attractions in Europe – Eisriesenwelt (translated: World of the Ice Giants). Matthew and I abandoned the girls to their 'Sound of Music' tour and took a train for a half hour or so trip to Werfen. Here a small bus wends its way steeply upwards for a few kilometres and then it was out in the rain for the quarter hour walk to the bottom of the cable car. The car lifts you a giddy 500 m almost vertically to where another kilometre walk awaits. Sections of this are under cover owing to the threat of stone bombardment from the snowy flanks higher still. At an altitude of over 1600 m the large circular cave entrance beckons from a formidable cliff face. Unfortunately there are no photos as the girls had commandeered the camera.

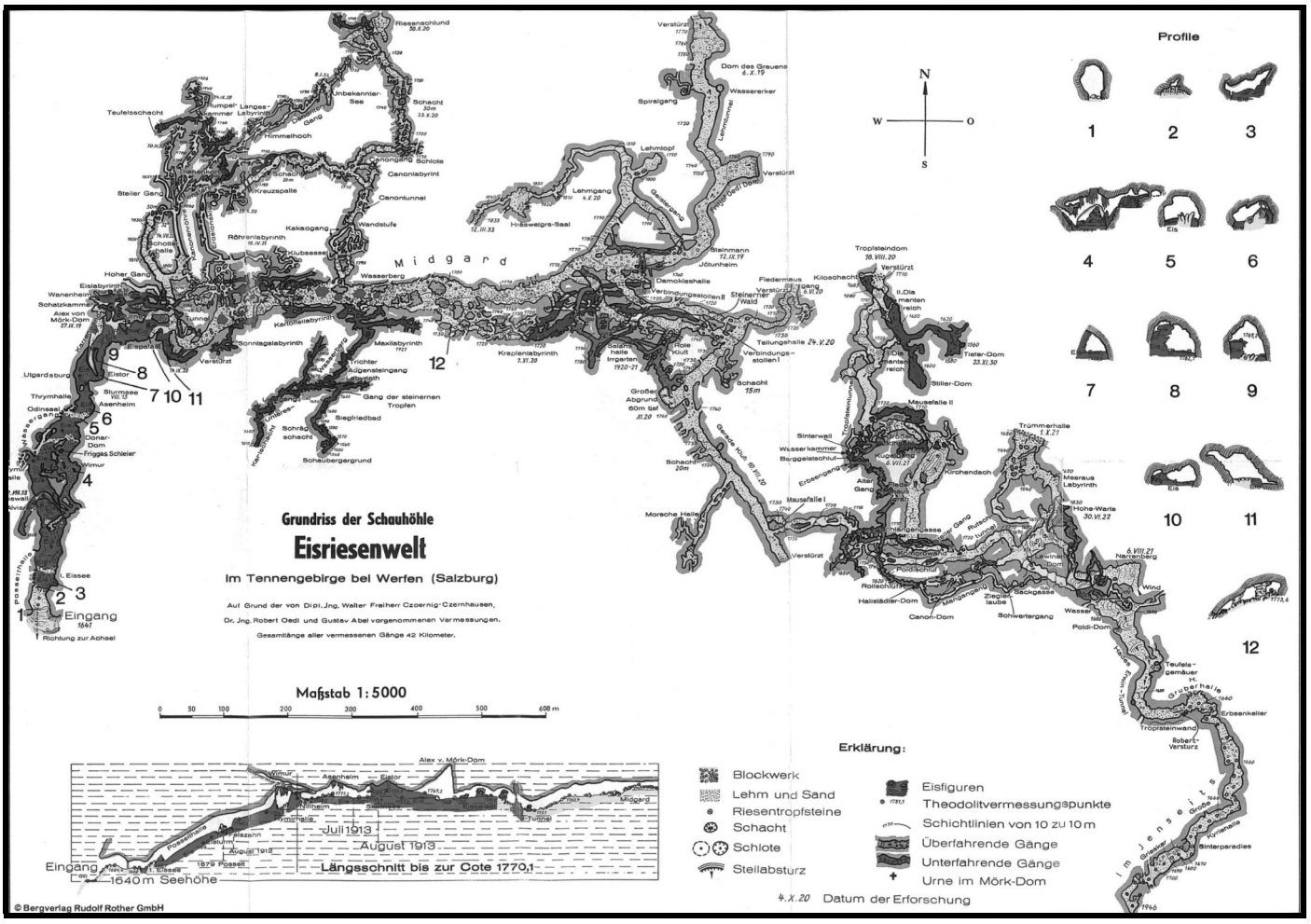
Standing in the entrance as we awaited our turn I had to question the wisdom of wearing but a T-shirt and jumper. Like – Hello! This is an ice cave! The cold breath of the cave underscored the chilly ambient temperature of the cave of just zero degrees. Later – armed with carbide lamps – the group filed in through the doorway. Here a wind gusted so strongly as to push you back out again and the temperature plummeted alarmingly due to the wind chill. Luckily for me the gale died within 10 m. Windspeeds of up to 100 km per hour have been recorded in summer. Within, the track climbed to a height of 134 m and the group never paused for more than a minute.

The trip traverses over a kilometre up a wide tunnel reminiscent of Railway Tunnel in Eagles Nest at Yarrangobilly some 30 m across and 30 m high. A map we bought later shows the cave to be over 40 km long! A short way in the steep climb begins. Peering up the steep ice slope you can see a pillar of ice rearing out of the gloom and many metres higher and beyond the spooky outline of a second Ice Giant stood guard. Awesome stuff!

By the time we reached Mork Dom – one of the largest chambers and the tour turnaround point, we could fully appreciate the celebrated achievements of Alexander von Mork in getting this far. Apart from the kilometre climb up the mountain range over rock and snow to the cave's mouth, the tedious climb of the long ice slope with crampons, he had conquered both a first ascent of the formidable ice wall crowning the climb and a swim in a diver's suit of the frigid lake behind it (Sturmsee). Unsurprisingly a channel was cut to drain the lake for further visits. Alex himself would not long benefit from his bold achievements – he was drafted into the Austro-Hungarian army and perished during World War One.

In the upper level are a number of remarkable ice formations which the guide lights up by burning magnesium strips to reveal the fantastic shapes carved in iceberg-blue, fringed in translucent icicles. The formations do vary over time of course so names have changed over the years to keep up with the shapes.

The tour is given in German but English notes are available.



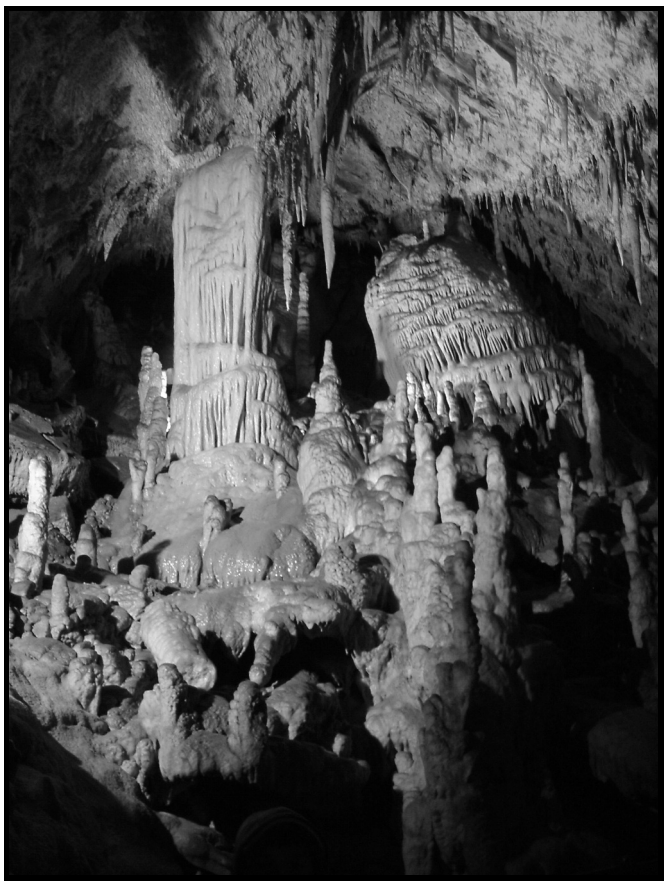
Slovenia

Slovenia is literally the home of Karst. Virtually the whole country is riddled with caves. Although cavers would be more familiar with the names of systems elsewhere in Europe for longer and deeper caves there is probably little doubt that Slovenia boasts some of the best known tourist caves.

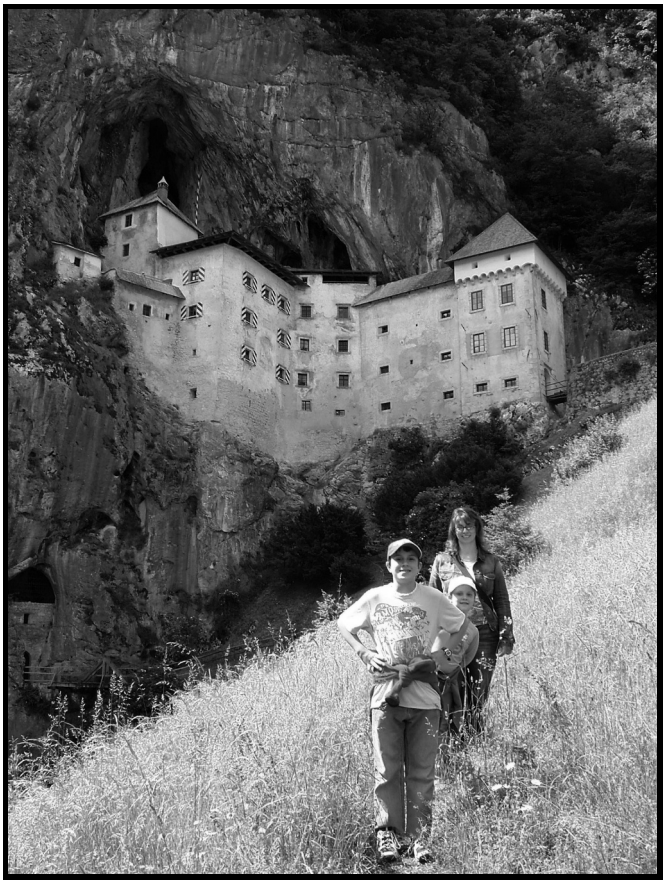
The first to be visited was Postojnska Jama – now seen by almost 30 million visitors! Here was a cave to rival Disneyland – just inside the entrance tourists board a train. We shared ours with a detachment of the Slovenian army. Once seated two abreast the train sets forth at a sobering rate. No throwing arms up in the air here unless you wish to leave them behind. Taller people should remember to duck. The train rattles on a track down the main tunnel of the cave for two kilometres. This tunnel is not man-made but rather is well-decorated fossil river passage. Occasional rooms are traversed including one cavern replete with lit chandelier.

At the end of the track is large rambling chamber floored in a mountain of rockpile covered top and bottom in the best colourful traditions of stalagmites, stalactites and flowstone. The tour divides up into groups according to native language and then your guide tells you something of the history of the cave and allows you to head off along the path for a kilometre crossing Ruski Most (a bridge built by russian POWs in WW1). There is little supervision – many give the formations a grope on their way through and I reflexively admonished a couple. The guides didn't care and I had to say there was no real evidence of deterioration. The cave was a cool 8 degrees and perhaps this was why the tourists stormed along the track or perhaps we were in danger of missing the train back. Certainly there was no dawdling. Pictures were taken with a quick point of the digital camera despite the signs showing camera with a cross through them. The guides saw them and merely shrugged their shoulders.

All along the way was a profusion of stals – very attractive cave. However I saw no sign of the more delicate stuff familar to Jenolan such as dogtooth spar, helictites or aragonite. The track finished at a large dome-like chamber with a flat floor – obviously perfect as a field for Ultimate Frisbee matches but utilised instead for a kiosk and orchestral hall. Of course there was also the obligitaory Proteus display (see France article by Norton et al.). A short separate cave near the entrance has been converted into a museum cum laboratory for studying and exhibiting the cave fauna. The Proteus was first discovered in the Postojna System.



Postojnska Jama

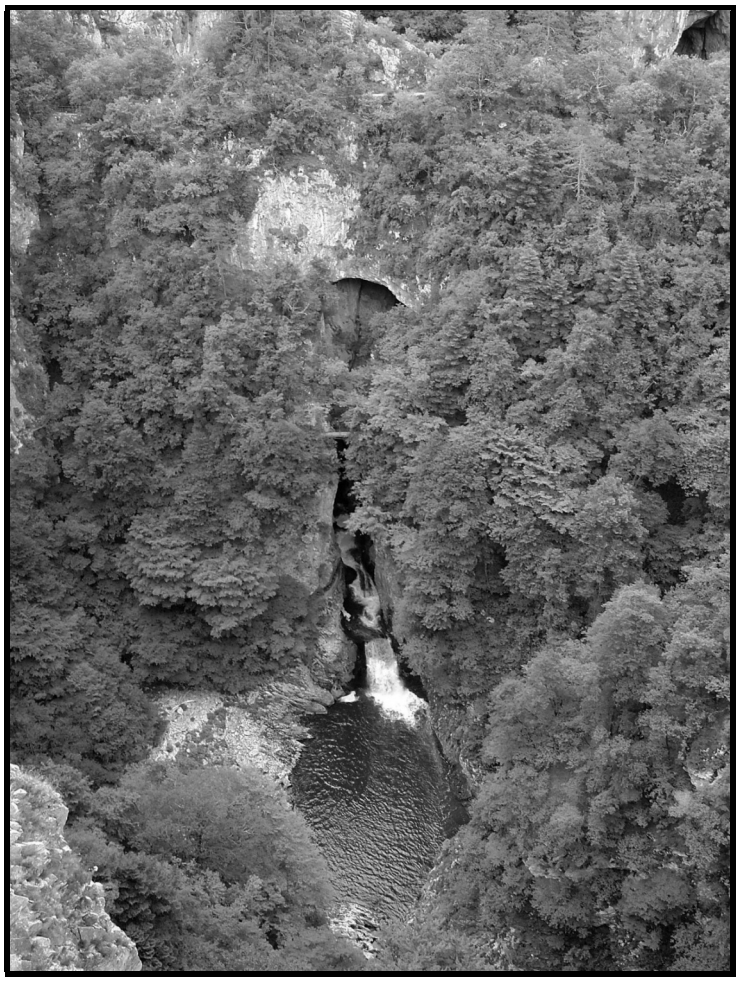


Predjama, with Long Drop

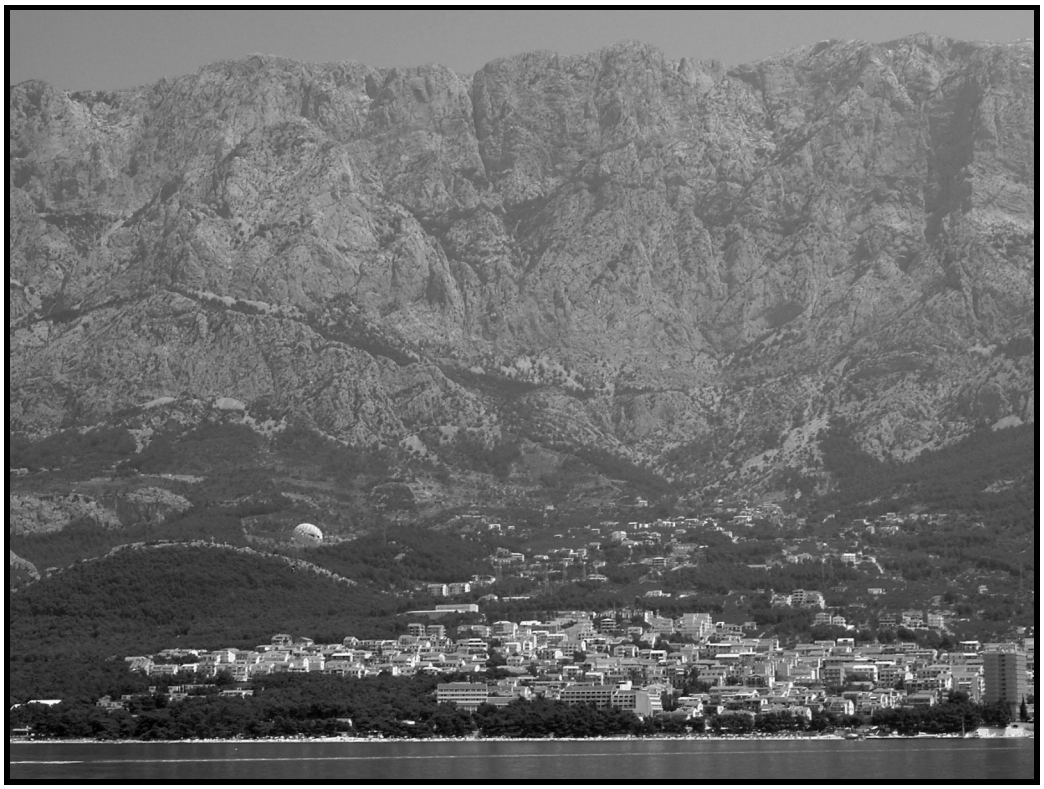
The next day we travelled 11 km by taxi to another part of the 20+ km Postojna System (a number of nearby showcaves were connected over the years by cavers to the Postojna System. This one is Predjama – a photo of which has also featured in an earlier SUSS Bulletin). The most remarkable feature of this cave is the impressive castle built into the entrance. The castle is genuine and was famously the haunt of a popular and charismatic rogue named Erazem. The cave under the castle ensured Erazem could always escape and that the castle could never be successfully beseiged. There were stories of Erazem taunting his beseigers with gifts of roast fowl leftovers while they starved. Legend has it he was betrayed. When using the privy in the tower a traitor signalled his enemies who fired their cannon. Erazem took the Long Drop.

Not only is there a back passage from the castle but it overlies a swallet. We took a tour through the dry abandoned river passages using lead-acid headlamps. It very much had a feel like 'real' caving back home – brown mud, dirt tracks, rocky chambers and some small bats. We exited on the bluff above the castle. The kids certainly felt more like having done a real cave trip compared with touring by train the day before and finished with a big grin on their faces.

Now we came to a day I had been long looking forward to – Skocjan Jama. There is an incredible photo of this cave on a poster in the guides' office at Jenolan, looking very much like a scene from the Bridge of Kazad-Dûm in Fellowship of the Ring. A bridge spans a deep underground chasm and an exposed winding path clings to the side of the canyon.

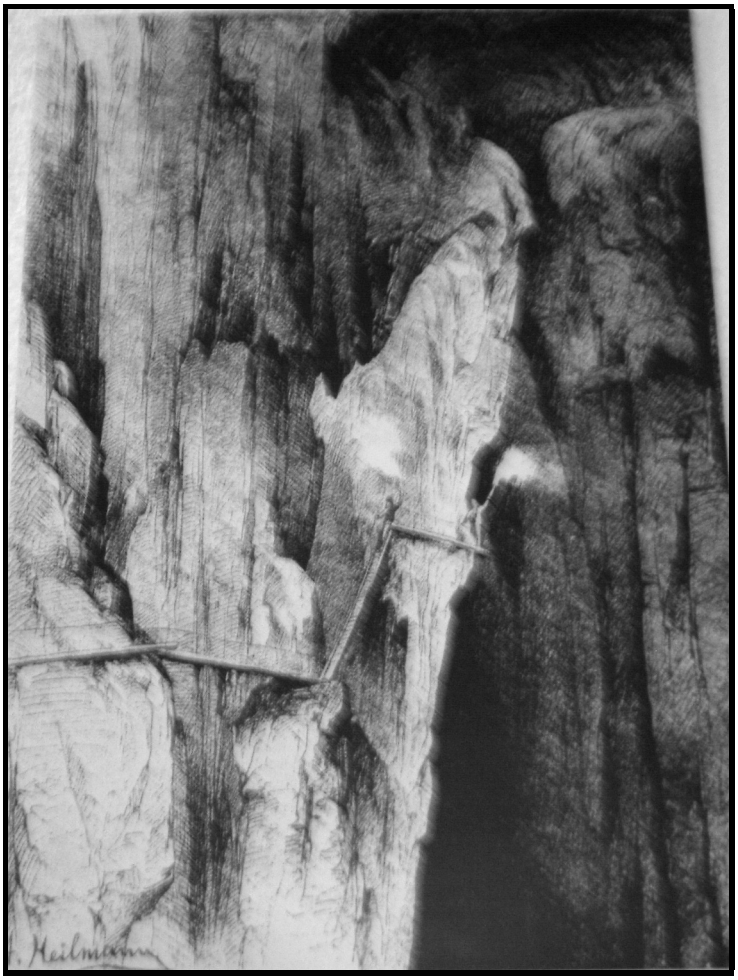


Velika Doline, Skocjan Jama



Dinaric mountains, Croatia – entirely limestone

As a supreme example of karst processes and in recognition of its place in early speleology and exploration in the early 19th Century the cave system was put on the UNESCO World Heritage list in 1986.



Print showing early exploration in Skocjan Jama

Unfortunately all the rest of my family had become ill and decided to have an easy day in the Postojna version of Caves House (a classic 1970s concrete edifice). I walked into Postojna and after some brief conversations in German discovered the railway station was on the outskirts of town. Luckily for me the train to Divaca was late. By further chance the compartment I shared was with two other visitors to Skocjan – an Englishman and his Australian partner. From the station at Divaca it was an easy 45 min walk to the caves.

The first glimpse of the cave system is a stunning view into the massive Velika Doline. Opposite the lookout a church sits on a precipitous cliff. Below the cliff a gigantic arch offers an obsucred view of the first part of this cave and out of its base thunders the Reka River. It crosses the doline to disappear under the lookout where it enters a vast subterranean canyon averaging 100 m in height and extending some 3 km to a sump. This is the main and most distant headwaters for the Timavo Springs some 35 km away near Trieste, Italy. The route is still almost totally unknown.

The tour begins through a man-made tunnel to reach the 'Silent Cave' – an extensive upper level found in 1904 by scaling a 60 m wall nearby to the present day bridge. This section is an old river channel and is a series of chambers, some very large, with attractive but inactive examples of flowstones, stals, columns and gours. After a time the passage reaches a point where the floor slopes away into darkness and the rumbling of a river far below can be heard. Here our guide, who had been toiling womanfully by giving the same spiel each stop in 3 different languages, pointed a little way downslope and told of how during floods in 1965 the siphons blocked up and the system filled with water, almost lapping into the Silent Cave. With a practically unimaginable pressure of water behind it the blockage finally succumbed and the 5400 million litres (my estimate) drained away.

With no flood evident I could see into the this large canyon and down to the Reka's many waterfalls below. The canyon was floodlit at various points and the combination of roaring river, soaring cliff walls, lofty and shadowy heights – the whole of this stretching for more than a kilometre out of sight into inky dark was a humbling awe-struck experience. It was like walking through a dream. I paused like all the others on the bridge which is situated where the cave takes a right angled bend towards the siphon and stared in vain into the gloom with the thoughts of a cave explorer – somewhere down there is one of the longest cave river systems in Europe. Out of sight is the mammoth chamber named for that most famous of cave explorers Martel when he bottomed the cave in 1890. After a while it is possible to spy out climbing ropes and cut steps snaking up into the roof – how game were these explorers! Eventually we wandered out into Velika Doline and walked around this towards the waterfall and the bottom of a funicular railway to take us comfortably out of easily the most impressive tourist cave in Europe.

Croatia

No caves were visited in this country but again we were witness to some massive karst. The Dinaric Mountains are Europe's longest limestone mountain range extending over 650 km along the Dalmation coast of the Adriatic Sea. They include the Velebit range – now the location of some of Europe's deepest caves (over 1300 m deep). The section we saw was further south between Split and Dubrovnik. This was nowhere more impressive than the mountain backdrop to Makarska as we crossed in a ferry from the island of Brac. The photos speak for themselves – this limestone wall rises up to 1700 m from the sea.

Diamond cave, Battambang province Cambodia

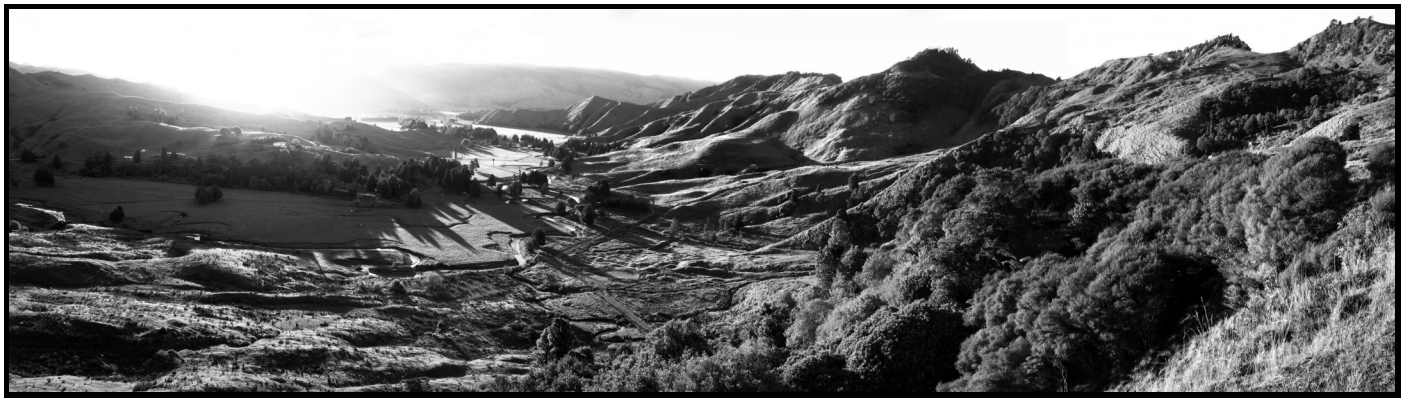
Photo Andy Herries

Long Tomo exit, Mangawhitikau, Waitomo

Photo Michael Fraser

Velika Doline, Skocjan Jama, Slovenia

Photo Mark Staraj



Kairimu Karst, New Zealand

Photo Alan Pryke

TRIP LIST: OCTOBER 2006

SUSS General Meetings are held on the first Thursday of the month at 7:00pm (for a 7.30pm start) in the Reading 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 Reading 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

14 – 15 Jenolan. Dual permit diving and caving. As the diving exploration continue at Jenolan. Need to lose weight or get fit for summer. Go exploring, take photos, if you are up to it, help with diving kit. Contact Michael Collins michaelc@trimixdivers.com or 0425 210 361.

21 – 22 Bungonia. Lets do some of the obscure caves out of the Bungonia book. Also check out Spewing Water Cave on the other side of the gorge – contact Keir Vaughan-Taylor keirvt@optusnet.com.au or 9816 5210 (home).

21 – 22 Borenore. Eliminate the caving and just do the Wine Festival bit. Contact Phil Maynard (home) 9908 2272 or philip.maynard@uts.edu.au.

28 – 29 Hartley Vale Mines. See the escarpment of the old late 1800s oil/shale feniculae railway. One very short mine to survey. Search for mines filled with water to supplement a local farmer's water supply. Contact Guy McKanna Guy_McKanna@mlc.com.au

November

2 General Meeting. Holme Building 7:30pm.

4 – 5 Bungonia. Vertical caving in Drum and others. (Vertical experience required). Contact Michael Fraser michaelfraser172@hotmail.com or 0419 236 576.

11 – 12 Tuglow. Underground waterfalls, rivers and perhaps cave yet to find. Contact Mark Lowson 0415 338 601 or m.troglodyte@gmail.com.

18 – 19 Jenolan. Many finds to further explore and many new leads. Contact Tina Willmore tinaw@chw.edu.au or 9845 2325 (work).

25 – 26 Narrow Neck Mine. Take a short cut through Narrow Neck, in one side and out the other. Slaven cave, the cave that could stop a power station. Locate the other rumoured Lithgow sandstone caves and escape into the dark zone. Also explore a mystery doline. The smoking gun that transformed a gold mine into a water supply. All unexplored. Stay on Ian Cooper's floor. Contact Phil Maynard (home) 9908 2272 or Keir Vaughan-Taylor 9816 5210 (home).

December

2 – 10 Jenolan Caves. Christmas trip, everyone welcome. Sausage sizzle party, many finds to further explore and many new leads. Contact Phil Maynard philip.maynard@uts.edu.au or (home) 9908 2272.

7 General Meeting. Holme Building 7:30pm.

16 – 17 Kanangra Main. Waterfalls (big ones) rivers and awesome vistas (for the vertically experienced). Mark Lowson m.troglodyte@gmail.com or 0415 338 601.

January

16 – 17 ASF Conference Mt Gambier. Every two years the Australian Speleological Federation has a caving conference. Generally they are pretty good. Hang out with speleos from all over Australia. See a town built around dolines. See Australia's most recent volcano. Take your swimming costume to snorkle in some resurgences. Contact: Marie Choi, Conference Coordinator, mariechoi@adam.com.au