

The Journal of the Australian Speleological Federation Inc.

CAVES

AUSTRALIA

VOL. 225 | AUGUST 2023

CONFERENCES

2025 - 1st Circular

EXPEDITION

Vietnam

CONSERVATION

Tilting Activities



AUSTRALIAN
SPELEOLOGICAL
FEDERATION

CAVES

AUSTRALIA

CAVES AUSTRALIA

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COVER: PHOTO BY NADINE MURESAN - BOGDAN MURESAN IN GURA CERULUI - "THE MOUTH OF THE SKY" ROMANIA

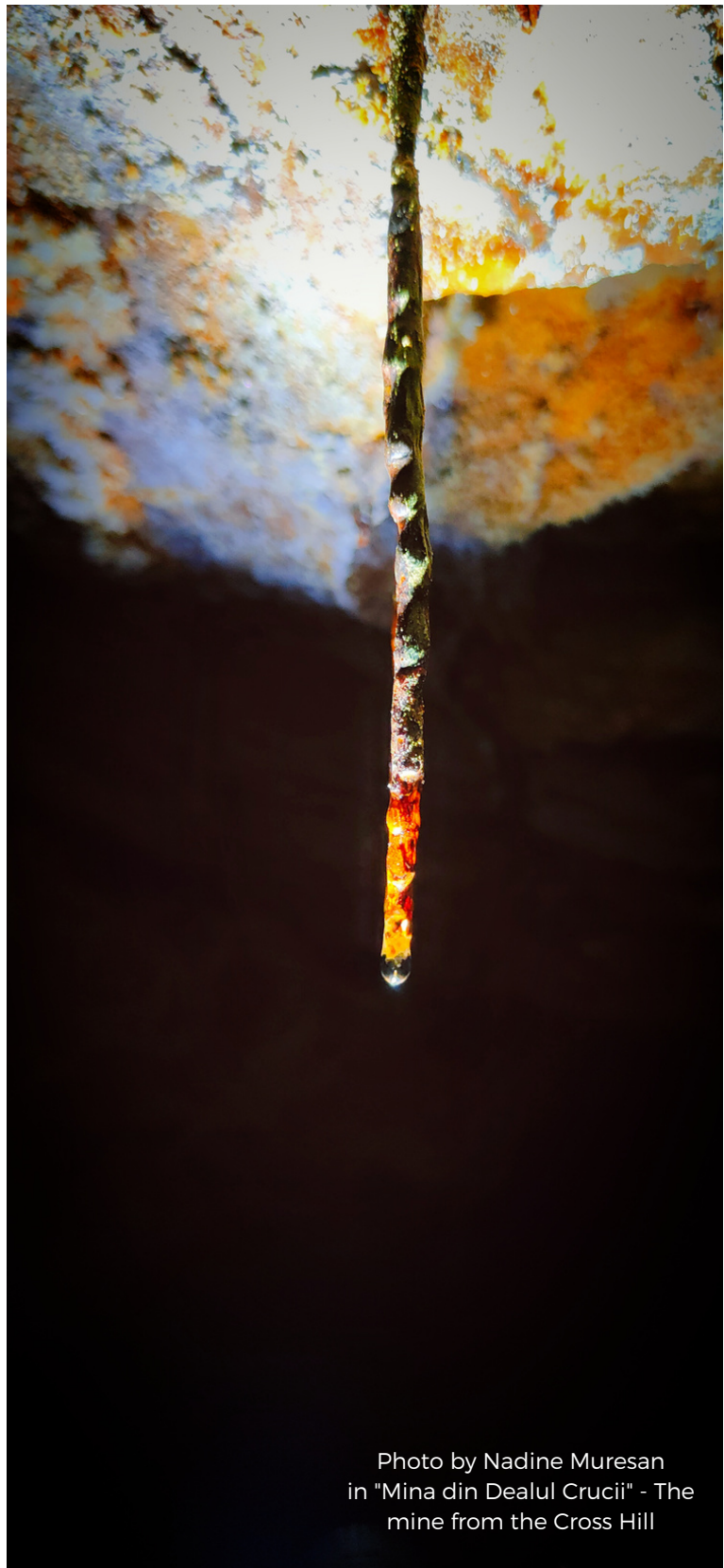


Photo by Nadine Muresan
in "Mina din Dealul Crucii" - The
mine from the Cross Hill

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Side-lit formation in Genghis Khan

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Photo by Stella Nikolaevsky

Editor's Note

Nadine Muresan

With each *Caves Australia* released I gain a better understanding of the Australian caving community. I get more emails, messages and updates about what people are doing and I absolutely love being able to share this with the rest of the caving community.

When I first took on *Caves Australia* the question of whether it was still relevant, still valuable and beneficial, was asked. I am very happy to say that I think it is needed and, thanks to all contributors, is flourishing!

This *Caves Australia* has an amazing range of articles, with loads of information from the Ceduna conference and the first circular for the 2025 ASF Conference in Buchan, to expeditions across the seas.

I am thankful to all those who have contributed articles, ideas, photos, maps and stories for *Caves Australia* but there is always a desire for more. Though articles are now coming in more frequently it is still a small group of contributors providing the majority of input. It would be great to have stories or articles from all of our member clubs to share with the broader caving community. *Caves Australia* is about sharing what you are up to; maps, photography shoots, exploration, expeditions etc. It would be great if each club could make an effort to put together an article sharing some of what you are doing, or have done, with the rest of the caving community.

So, wishing everyone a happy spring caving season and looking forward to the next edition. Till then, let's go CAVING!



PRESIDENT'S REPORT

August 2023

SARAH GILBERT

This edition of *Caves Australia* brings you more highlights from the recent ASF Conference in Ceduna.

The ASF and conference attendees acknowledge the Far West Coast people including the Mirning, the Wirangu and the Kokotha, who are the traditional custodians of the land which we visited around Ceduna and the Nullarbor Plain. We recognize their long and deep connection with the country over the past 60,000 years. It was a privilege to meet and connect with Mirning Elders Anton and Chem who joined us for the field trips to the SA caves. The ASF would also like to thank the support of the Far West Coast Aboriginal Corporation and the rewarding chance for the caving community to foster relationships with the traditional owners.

The conference was 5 days of talks, workshops and social events followed by a second week of caving on the Nullarbor, both on the SA and WA sides of the border.

Workshop highlights were Brian Evans' Cave Rescue Workshops and Clare Buswell's on Conservation & Nullarbor Green Energy Hub. These were great opportunities to get hands on experience and for in depth discussions. A conference with field trips to the Nullarbor was particularly timely for the Green Energy Hub proposal and focusing the work that needs to be done to stop the proposal and the destructive impact it will have on the unique and beautiful landscape the western Nullarbor and its caves.

If you would like to get involved with this campaign or cave conservation in general, please get in contact with Clare or the ASF Executive asf.caves.info@gmail.com.

The ASF would like to welcome Minky Cockshell (CEGSA) to the KCF board of directors. The KCF supports many Club environmental projects including HCG exploration at Yarrangobilly and the Kangaroo Island cave inventory work, university research projects on the critically endangered bent-wing and ghost bats, and the amazing and creative Cave Animal of the Year initiative. Follow [this link](#) to make a tax deductible donation to the fund.

(<https://www.caves.org.au/conservation/karst-conservation-fund/donating-to-the-fund>)

While it's winter caving in south, it's expedition season in northern Australia. Cavers from across the country have headed out on the annual trips to Bullita and Kimberly regions. We wish everyone many kilometers of new cave to explore & survey. We also look forward to hearing about the trips in future editions of *Caves Australia*, along with all the other exciting Club events.



CAVING IN THE **MOONLIGHT**

1st Circular



33rd ASF CONFERENCE 2025

33rd ASF Conference “Caving in the Moonlight”

Dear cavers,

The 33rd ASF Conference *Caving in the Moonlight*, is to be hosted by the Victorian Speleological Association (VSA) and will be held in Buchan, Victoria between 12th and 19th of January of 2025. The ASF Biennial Conferences cover a wide range of subjects related to Speleology, and the conferences themselves serve as an important meeting point for caving enthusiasts, technical caving specialists and scientists with cave-related interests.

Where?

Buchan, Victoria. The primary venue is Buchan Mechanics Hall at 45 Main Rd, Buchan VIC 3885. The hall is positioned in the centre of the town right next to the Buchan Caves Hotel.

What?

Oral-digital presentations of latest research in speleology in Australia.

Poster presentations of research and exploration.

Stands for clubs to present their activity since the previous conference or lifetime activity.

Workshops

Speleosports: SRT challenge course, speed ascent, crawl and squeeze challenge and more.

Cartography salon

Photography salon

Caving trips for all abilities

Where to stay

Buchan is a small town and accommodation options are limited however there's more than enough camping for a true nature lovers experience. Please prioritize camping locations and leave indoor accommodation available for the ones that really need it. Camping has been confirmed in the North arm at Buchan Caves Reserve Campground with powered and unpowered sites. Please contact Leanne on (03) 84272231.

There is another camp site and 8 other cabins, motels, cottages and B&B available. Please find a list of options on the website.

Abstracts and poster submissions

Please go to our website <https://www.asfconference2025.com/> and submit your abstracts on the Abstract Submission page or send us an email at asfconference2025@gmail.com. The deadline for abstracts and poster submission is 1st of December 2024.



2023 ASF Conference, Secrets of the Nullarbor

Sarah Gilbert & Sil Iannello

The ASF and Conference Organising Committee acknowledge the Far West Coast people including the Mirning, the Wirangu and the Kokotha, who are the traditional custodians of the land which we visited around Ceduna and the Nullarbor Plain. We recognize their long and deep connection with the country over the past 60,000 years. It was a privilege to meet and connect with Mirning Elders Anton and Chem who joined us for the field trips to the SA caves. It was a wonderful opportunity to strengthen relationships between caving community and the local Traditional Owners.

In April 2023, South Australia finally hosted the 32nd ASF Conference in Ceduna, after two years postponement due to the pandemic. After organising the conference via many, many Zoom meetings, it was wonderful for everyone to finally gather together in person. The conference was an event that brought together caving enthusiasts and professionals from across Australia and around the globe. There were ~90 attendees, and all but one ASF local, made a considerable effort to reach Ceduna – driving from as far away as far north Queensland, Tasmania & Western Australia, as well as international guests from Europe.

The conference started with a Welcome BBQ on Sunday April 16th and created a warm and welcoming atmosphere for all conference participants. It set the tone for a fantastic week of friendship and shared experiences. Thank you to Foodland Ceduna for sponsoring the BBQ.

The conference was a week of presentations, workshops, and social activities. Some of the highlights include:

Brian Evans gave a series of cave rescue themed talks and workshops, along with Dave Wools-Cobb, Deb Hunter and Ian Collette. Ian and Brian ran a popular hands-on rope rescue skills workshop that were held in conjunction with the Speleo Sports afternoon. Many conference attendees took the opportunity to hone their pick-off rescue skills.

Clare Buswell presented an update on the ASF Conservation Commission, the Kangaroo Island resurvey project and facilitated a workshop and discussion on the proposed Western Green Energy Hub development which will have a huge impact on the Western Australian Nullarbor. This followed on from a series of Nullarbor themed talks which showed the diversity and natural values that would be threatened by the WGEH proposal.

Mateja Ferik travelled all the way from Slovenia to attend the conference and presented the recent work she and Matej Lipar have been doing on the geomorphology of the Nullarbor.

Cathi Humphrey-Hood and Rod O'Brien organised the very popular 'Library Reading Corner' in a side room to the Conference Hall. They brought with them from storage in NSW a wide range of books and other publications from the ASF Library. It was a fantastic glimpse into resources that the library has to offer.

Other talks included exploration in Australia and international expeditions, conservation projects, Tasmanian hydrology, NZ lava tubes (under residential Auckland), the latest in bat research, and cave crickets biodiversity.

Thursday afternoon was spent at the Ceduna Area School for Speleo Sports and the Prusik Challenge. The Prusik Challenge was a rope obstacle course around the top of the playground shade structure. A shout out to Brian and Ian for their creative use of non-vertical space! The activities provided an exciting and engaging platform for cavers to showcase their rope skills and share knowledge.



2023 Australian Speleological Federation Conference, Secrets of the Nullarbor Committee

Photo Credit: Minky Cockshell. From the left: Sil Iannello, Heather Duff, and Pam Payne, at the back: Heather Heatherez, Sarah Gilbert, David Mansueto, Matt Smith, and Peter Kraehenbuehl; at the front: Kaiah Fisher and Dee Trewartha. Special thanks to: Andrew Stempel, Damien Pilkington, Dan Dingwall, Janice Chan, Minky Cockshell, and Steve Milner for their help and support.



Photo by Dan Dingwall - Cave: Thampana N206
Cavers: Sil Iannello and Janice Chan

Competitors in the Speleo Sports had to negotiate mazes, find a lost key, retrieve a DistoX dropped down a crevasse, safely traverse a pit of snakes, take a cave-spotting flight along the Bunda Cliffs and try not to break any stalas along the way. It was a wonderfully creative course and everyone had a lot of fun on the school play equipment. Thanks Heather & Minky!

A social quiz night was held on Tuesday evening. It was a fun challenge with plenty of laughter as well as furrowed brows testing both general knowledge and cave-related topics.

Thursday evening included a film night, showcasing some of the historic footage that has been digitised through the ASF Library. This included footage from the Mt Etna conservation campaign in the 70s and short films from the UNSWSS archives: 'Crystal Kingdom' filmed at Cliefden caves and Kubla Khan.

There was so much more! The cave photo competition attracted nearly 100 entries and featured new categories such as 'dead animal' and 'smartphone'. There was a silent auction to raise money for the KCF, a mid-week activities day, conference merchandise, bar, and catering - Thank you to all who assisted in making all this happen!! You know who you are.

The conference also attracted the notice of the Eyre Peninsula Advocate who featured an article on the conference and why so many cavers had descended on Ceduna.

(<https://www.epadvocate.com.au/community/nullarb-or-secrets-unlocked-at-conference>)

The Cavers Dinner was held on the Friday night to finish off the formal conference events. It was an enjoyable and memorable evening, all thanks to everyone's enthusiastic participation and creativity. It was heart-warming to see everyone embrace the theme of dressing up as a Cave Animal of the Year, with costumes ranging from the mesmerising ghost bat to the fascinating cave cricket, the radiant glow worm, and the intricate cave beetles, among others. The energy and excitement in the room was contagious, and it created a joyful atmosphere-filled with laughter and shared stories. Thanks to everyone who helped set the tables and to clean up at the end!

The post-conference field trips followed on from the conference, with everyone driving out to various camp sites on the Nullarbor, 22-28th April. The stunning caves in South Australia and Western Australia were a highlight of the event. Those of you who assisted in arranging and leading these trips ensured that cavers had a unique opportunity to explore and appreciate the natural wonders of the Nullarbor region. Thanks Matt Smith! Highlight caves were, White Wells Cave, Murrawijinne caves, Warbla, Weebubbie, Abrakurrie, Webbs, Purple Gorange, Thampana and Old Homestead to name a few. Thank you to the Far West Coast Aboriginal Corporation and SA Nation Parks and Wildlife Service for permits to visit the SA caves. Thanks also to the Campbells on Mundrabilla station for allowing so many cavers to camp and explore the caves on their property.

The Secrets of the Nullarbor Conference couldn't have happened without the help from our amazing sponsors! We extend our sincere thanks to Aspiring Safety, Mt Millar Wind Farms, Scurion, Climbing Anchors, Country Living Camping Fishing, Foodland Ceduna, and TFM Engineering. We are grateful for your support!

A huge thank you also to the local businesses and bodies without whose support so many things, including the post conference caving, could not have taken place. Thanks to Holly and Co for the incredible catering, to Arts Ceduna for the awesome workshops and assistance with local information, Shelley Beach caravan park for accommodating us in such a beautiful environment, National Parks and Wildlife for all their organisational support, storage of gear and the parks permit and SA camping, to Ceduna Area School for use of their playground and facilities for Speleo Sports, and a big thank you to the Far West Coast Aboriginal Corporation for granting permission for us all to access traditional lands.

With regret, we note the sad passing of Dale Furley, who died in early July in a motorcycle accident. He was the coordinator of the Indigenous Rangers program with the FWCAC and was a great supporter of the conference, helped us negotiate the process for permission to cave on Mirning land, was a loving father and cared greatly for the community and Country.

Once again, we cannot thank everyone enough for making the 2023 ASF Conference a success. Your contributions have left an indelible mark on the conference and will be cherished by all cavers for years to come.

Want more pics?

Go to: <https://photos.app.goo.gl/aEkyETiskmBWJPs5>



Photo by Deb Hunter Cave - Thampana N206
Caving Club Members: SA, WA, TAS, NSW, VIC, UK



Photo by Minky Cockshell - Speleo Sports winners. From the left: Deb Hunter, Jack Overhill, Stephen Fordyce, Heather Duff and Heather Heathe. Thanks Minky for making the bat awards.



Photo by Matthew Smith - Minky Cockshell, Heather Siebert & Jim Crockett exploring the bottom of Wombat Cave



Photo by Sil Iannello -
Pick off challenge: Heather Duff and Stephen Fordyce



Photo by Matthew Smith - Minky Cockshell, Heather Siebert and Paul Osborne setting up the rigging for Warbla Cave.



Photo by Matthew Smith - Minky Cockshell under the entrances of Wombat cave

CEDUNA PHOTOGRAPHY WINNERS

External cave

Matej Lipar - Rock Islands through cave



Peoples choices Winner

Winfried Weiss- Smart Phone



Fire and Floods

Matej Lipar - Stranded on the
Nullarbor Plain



Internal Photo & Peoples choices Winner

Nadine Muresan -
I know you are cold but hold still!

People

Stephen Fordyce



Dead Animal

Garry K. Smith - Mummified Quoll
in TR8 Timor

Funny

Bob Kershaw



Smart Phone

Garry K. Smith - Verandah Cave
Borenore





VIETNAM EXPEDITION

ALAN JACKSON STC

Photo by Alan Jackson - Becka emerges from
the misty void in Hang Chả Nghéo

Back in the Habit

In March 2020 I was onboard the COVID rollercoaster, navigating uncharted pandemic waters on my way back to Australia from a Vietnam caving expedition. The ensuing months of lockdown and doomscrolling provided plenty of time to consider the big questions in life, like “Is this the end of civilisation as we know it?” and “Will there ever be international caving expeditions again?”. Some people wouldn't apply equal weighting to those two questions, but the opinions of non-cavers are not of consequence here (or many other places, to be honest). Three years on and the world has adopted a ‘nothing to see here’ policy and we're back to shaking hands, coughing on one another and jumping on airplanes to have self-indulgent, carbon-intensive caving interludes around the globe. Thank goodness for the latter.

2021 and 2022 had seen me become a workaholic who couldn't get motivated to go caving locally (a handful of trips in two years is in stark contrast to the obsessive-compulsive Alan of old). 2023 was shaping up to be equally hectic but sanity prevailed when the expedition invites were circulated in mid-2022 and I remembered to choose fun over mindless capitalism and familial obligations; I set aside the month of March for the joys of jungle horror. When the time finally came to step onto the plane I was concerned at my general level of apathy for the whole thing, but I was confident the spark would be there once I switched my brain to expedition mode. This was my sixth Vietnam expedition and it was a matter of routine for me, but I had Gabriel Kinzler tagging along this time and it was his first international expedition, so he was full of nervous energy and anticipation.

South-East Asia caving expeditions are a different beast to most other areas of the world. Westerners are used to being the masters of their own destiny, calling the shots and having everything planned out (and going to plan). If you're not good at going with the flow then don't bother coming to Vietnam - it'll do your head in. Sometimes the flow takes you to places that annoy you to tears but just frequently enough you wash up on the shores of cave exploration paradise and get your mind blown. But enough philosophical crap; you want to know what happened this expedition.

The Team(s) and First Tours of Duty

There'd been a few people pull out, so we were a small crew: two Aussies, one Kiwi-based Pom and six proper Poms (but four of them live and work in Vietnam most of the year). Once all had made their way to Phong Nha (Quảng Bình province) in central Vietnam, we were given the general expedition plan by Deb Limbert. Deb and Howard Limbert are the glue that has held Vietnam caving together since their pioneering expedition in 1990, becoming experts at navigating the excruciating bureaucracy and nonsense of the place. We would split into two teams, with one group heading off nearby for a three-day trip in the Sơn Trạch district while the other headed out for up to five days, north a couple of hours, to a section of low relief karst not previously looked at in the Lâm Hóa district.

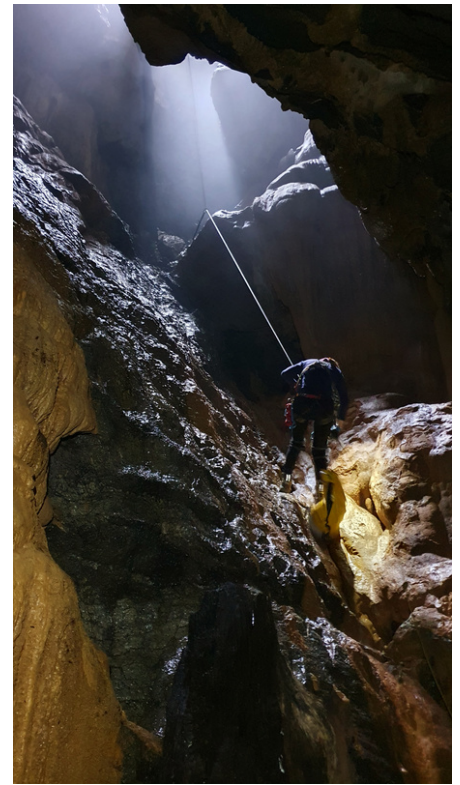


Photo by Alan Jackson - Becca descending the Hang Phá entrance pitch



Photo by Becca Lawson - Dave and Alan enjoy BBQ rat and rice wine

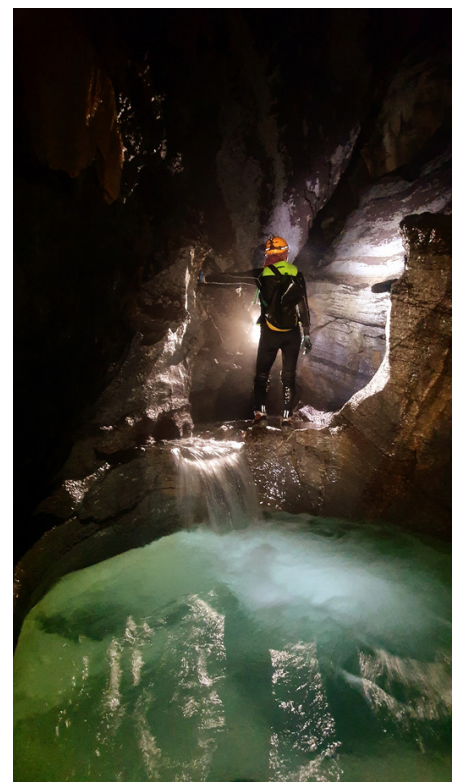


Photo by Alan Jackson - Cascades and circular pools in Hang Phá

Gab and I were on the three-day local trip with Dave Ramsay and Becka Lawson. Dave was an old hand (his first expedition was in 2014 along with me) and Becka was a 'nam-newbie like Gab (but an otherwise very well-travelled international caver). Our trip was a bit of a fizzer. We only got one new cave in the three days out, which was a 200 m through-trip with a 50 m pitch to nothing halfway along. We did get to do some terrifying maneuvers on the surface getting there, though, climbing down cliffs on vines above razor-sharp karst spikes. I generally find in Vietnam that once underground I'm in my comfort zone and it's the outside world that challenges me physically and mentally.

Once we got back to civilisation we heard that the other crew would be staying out their full five days as they had endless going stream caves and their main problem was they were getting a bit cold with all the swimming since they hadn't packed enough neoprene. We felt their pain.

Things Get Serious

We reset and headed out the next morning to an area an hour or so north of our Phong Nha base which had dished up some great caves in recent expeditions and had hardly been looked at in the H \acute{o} a Sơn district. The downside was that it's a tricky area to get into, with long hikes and steep terrain so we had seven days set aside. Day one was tied up driving to the area, getting past the military and national park check points, corralling the local guides, then an afternoon of slippery, leech-infested walking to a camp. Day two saw the uphill come, as we made our way to ~750 m elevation over the course of the day, arriving early afternoon to a spot near our first good lead. The locals had described this cave as 'a vertical shaft with water going in and mist and a one-minute drop'. Presumably they'd just rounded to the nearest minute, but regardless we were expecting a big pitch. We set up camp then headed over to the entrance for a recce while we waited for the rest of the porters to arrive (who had all the rope etc.). Two small streams combined (but would be raging torrents in the wet season) and promptly tumbled into a yawning abyss. Some rock-tossing suggested it was a 70-100 m pitch. In order to avoid the water, we sussed out a traverse accessed via some boulders and logs beside the pit then returned to camp to await the essential gear. It arrived late afternoon and we kitted up in the hope of getting the big first pitch out of the way and working out what (if anything) came next for a continued assault the next day.

At this point, things all went rather to crap. Gab and I reached the entrance and while I started getting my SRT kit on, Gab ferried rope around to our start point. In the process, a boulder (about 1 m long) decided that while it had been happy to tolerate the four of us walking over it an hour early, it wasn't going to play ball anymore and launched itself at Gab. Lots of scary noises were generated and Gab wound up standing in a gap between two large rocks with the offending boulder wedged above him. Thankfully he wasn't pinned but unfortunately he had got his right arm tangled up with it at some stage and it was looking a bit on the floppy side. We pivoted to emergency response mode and gritted our teeth for a long evening. It was about 4:15 pm.



Photo by Alan Jackson - Gab and Dave compete for the sprinter's jersey in the Tour de Phong Nha



Photo by Becka Lawson - Cave rats roasting on an open fire



Photo by Alan Jackson - The offending rock

I won't dwell on all the gory details, for Gabriel's sake, but in a nutshell the rest of the day went like this:

- Injuries were assessed as radius and ulna both snapped clean through just above wrist and an associated deep laceration. X-rays would later show the radius was broken a second time halfway up the arm, also. Otherwise effectively unscathed.
- Drugs, betadine, splint, sling etc.
- Patient reassurance, general banter, inappropriate jokes etc.
- Get on the satellite phone and let Howard know a mercy mission was in-train.
- Pack up and slog out in the dark for six hours with some of the locals who knew the way best.
- Load Gab into an awaiting ambulance at about 1 am and shoot to the nearest medical centre in Đồng Hới.
- Begin the long process of healing physically and mentally ...

All in all, a rather unpleasant experience, particularly for Gab. The route out was more direct than that taken in, but that meant it was steeper and a lot of time was spent on our backsides, sliding down a never-ending clay track being attacked by leeches (which love the cool, moist nocturnal conditions and swell in numbers considerably). Gabriel was amazing, running on adrenaline, and got out under his own steam with a walking stick in one hand and a porter steadying him on the difficult bits (of which there were many). Gabriel was left to the mercy of the Vietnamese medical system (a slightly terrifying concept) while the rest of us collapsed into beds.

Fill in Jobs

After a reasonable sleep in it was plan-hatching day. Gab was in the hands of the surgeons and was obviously out for the rest of the expedition. The other team had returned the previous afternoon with several kilometres of new cave in the bag but Martin Holroyd was flagging with what he thought was an asthma flair up of some kind. A visit to the hospital showed he had developed pneumonia (which lots of cold swimming in caves had no doubt worked wonders on) and he was ordered on to twice-daily IV antibiotics for two weeks. Two down. There was no point having an official mourning period, however, so we sorted a couple of fill in day trips out near Phong Nha for the next day while return journeys to H^oa Sơn and L^âm H^oa areas to continue where the respective teams had left off was organised.

The first day trip was another fizzer. Miscommunication and the usual chicanery of the park rangers (who were our guides for this entrance) saw us make four failed attempts at making it more than 50 m from the road until finally a passable way was found and we made it to the entrance of Hang Cây Sấu. The lead had been described as '10 x 7 m entrance leads to large cave with a pitch' or words to that effect. It proved to be a very simple short climb to nothing and only 100 m of cave. Front page news if you found it in NSW but not worth getting out of bed for in Vietnam! Ah well, it filled the day.

The second trip was essentially a tourist trip to a couple of classy stream caves used by Oxalis for adventure tourism. We enjoyed a nice through-trip in Hang Va and Nước Nut (great river caves) and carried a couple of dive tanks into the upstream sump of Hang Va for a dive Martin had planned.



I think it's broken

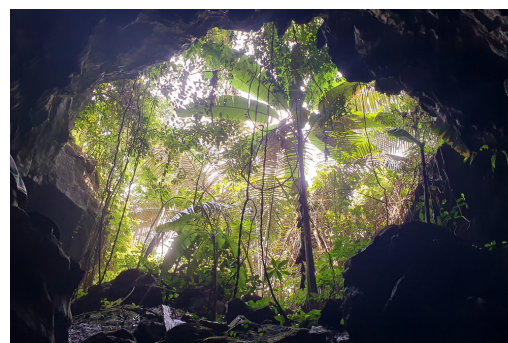


Photo by Alan Jackson - Hang Cây Sấu entrance



Photo by Peter McNab - Streamway waterfalls in Hang Va



Photo by Peter McNab - Streamway waterfalls in Hang Va

Take Two

Hóa Sơn second attempt was now on, sans Gab. With heavy porter loads it again took a day and a half to get back to our entrance (Hang Chả Nghéo). We'd already decided to name the big pitch Hand Job in honour of our fallen comrade. With the luxury of knowing the entrance elevation (750 m!) and the size of the entrance pitch this time round, we had brought a bit more rope. Despite the elevation in this general region, nothing yet had gone to much more than 200 m and most caves had had a mostly horizontal nature (with the occasional small pitch), so we hadn't got carried away and only had 324 m total. The afternoon of the second day we installed the traverse to get out of the water and found a way down that stayed dry till the last ten metres (where a knot-crossing five metres off the floor made for fun times ...). It proved to be an 84 m pitch. The rope landed in a deep pool. Not wanting to swim just yet, I pioneered a technique where I abseiled my legs into the water then kicked my feet to propel me sideways until I could just reach a nubbin to drag myself onto a dry ledge. The others then had the benefit of a tied off rope to pull themselves over. Almost immediately around a corner the water raced down a steep ramp and over a 20 m pitch to wide open (but steeply descending) cave. With only enough rope to partially descend this pitch we retreated to the surface knowing the next day would be an all-in.

The next morning, we took all the gear we had and barreled back in. Some adjustments saw us void the knot crossing on Hand Job and free up more rope for the next pitch. Once down the second pitch we negotiated a series of short pitches and cascades. It was wet, windy, noisy and uncharacteristically cold, but very sporting and lots of fun, trying our best to make a little (rigging gear) go a long way. The short pitches suddenly stopped and it got big again. Consecutive 50 m pitches put paid to much further progress. To save rope we could have gone down the guts, but it was way too wet for that, so we had to employ a rope-wasting traversing rebelay approach on rock that couldn't decide if it wanted to be overhanging or slabby. Eventually I found myself stranded about 30 m off the floor, hard up against the knot in the rope, spinning in free space, trying to see if there was a way on. The chamber was huge and misty, so it was impossible to tell. We'll just have to come back with more rope some other time. The survey data indicated we had a cave that was 352 m long but 278 m deep, so pretty darn vertical.

Days four and five proved to be somewhat disappointing. We progressively moved back towards the village and explored three mostly horizontal caves, but nothing much over 200 m long. It was quite a culinary adventure, though, with anything that moved finding its way onto the menu, including cave-dwelling mega-rats. I can't say eating rat was on my bucket list, but what's done is done.

Day six we had that sinking feeling that we were just marking time. We were taken off on a side jaunt to an alleged deep dry shaft but the guides couldn't find it and it looked like we'd be heading out to the village that afternoon but there was one last roll of the dice and the guide suggested there was another entrance somewhere nearby he could try to take us to. We were soon standing beside a 30 m pitch with the sound of roaring water below. Argh! Why didn't we come here three days ago!

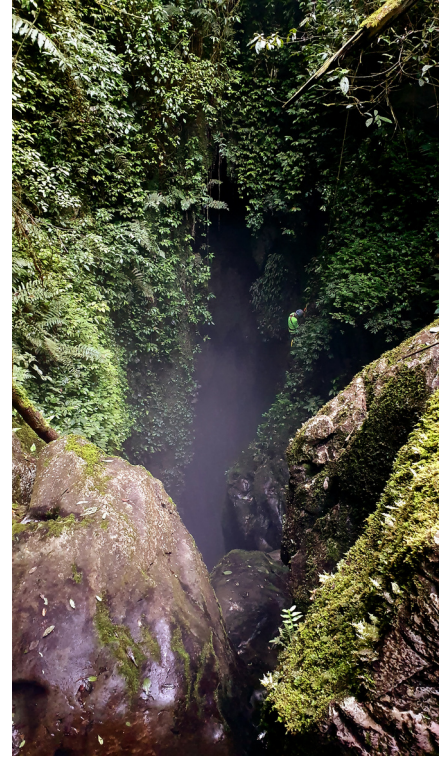


Photo by Alan Jackson - Dave lost in the greenery at the rebelay on the Hang Chả Nghéo entrance pitch

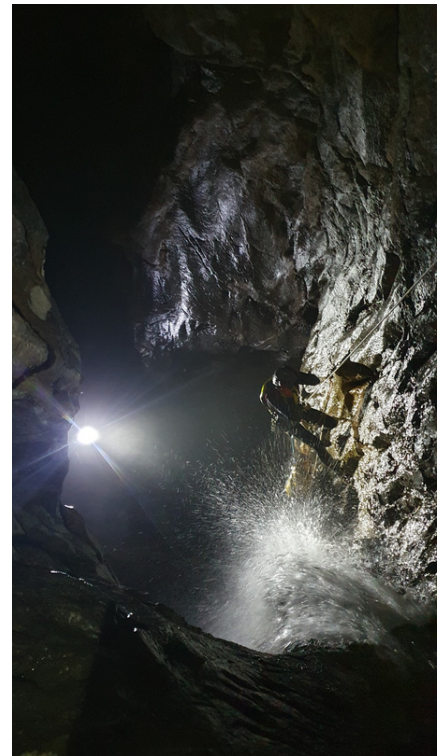


Photo by Alan Jackson - Small waterfall pitches in Hang Chả Nghéo

The entrance was actually terrifying once you abseiled halfway down and looked back up at the hundreds of tonnes of car-sized boulders and logs jammed overhead. But there was active stream cave down below, so some things have to be ignored; no-one ever gets hurt by loose boulders in caves anyway. We gleefully stomped downstream in wonderful sporting stream cave with swims, cascades and short handlines in magical, pale, clean-washed rock. After about 500 m we turned on time and left open passage for one last push in the morning. Spirits were high again and we were buzzing.

A highly motivated team got up super early the next day and raced off to the cave (Hang Phá). Alas, it sumped after only another 150 m or so, so we headed back to the entrance pitch and tried our luck in the upstream direction. A couple hundred metres of classy cave ensued before the main water again sumped and a dry side inlet eventually got too steep to get up. In the end a really classy 830 m of cave to lift us out of the doldrums of the previous couple of days. We were back at camp by lunch time, packed up, then slogged out to the village on the hottest day of the expedition (high 30s and >80% humidity ... yuck).

Back in Phong Nha we caught up with the other team. They'd had yet more success in Lâm Hóa, joining new entrances into their caves from the previous trip. They'd gone prepared with wetsuits, buoyancy aids and even some inflatable SUPs that Oxalis (the Phong Nha cave adventure tour company) has in the shed. This made surveying much more pleasant than attempting it while swimming, but also generated some hilarious moments when the airspace got low or there were tight bends in a few spots. SUP cave exploration – it just might catch on.

Retirement Caving

No rest for the wicked, though, so thoughts immediately turned to what was next. Gab had moved to a real hospital in Huế, had his surgery and was awaiting a flight back to Australia. Martin was still moping about doing the antibiotic thing while we charged about having fun. Howard and Deb had some work to do with Oxalis, so the team was extra small (just five of us). We three from 'team 1' decided we were sick of epic jungle walks and vertical caves and that we wanted some of the easy swimming caves the others had been doing, so we banded together for a third assault on the Lâm Hóa area.



We only had four days, as we'd been invited to attend a celebratory dinner at Oxalis with the head of the National Park, the head of Tourism and the local Communist Party leader. They get excited about our expeditions because many of our best finds go on to become adventure tourist caves. The authorities had heard about how well things were going in the Lâm Hóa area and wanted to make a song and dance.

Day one was commute day and we got ourselves set up in a buffalo paddock a short walk from the nearest village. The others had explored multiple river caves in the general area already, but they'd not yet found a way into any cave immediately behind the main resurgence (which is choked with rock fall) beside the village. Day two dawned with rain and constant thunder – great weather for river cave exploration. All we'd heard about this area was easy walks, horizontal/swimming caves, no rope work etc. but our local guide, Mr Ai, had said that this time he had a cave with a pitch in it, so bring some rope. We had chucked in 9, 14 and 34 m ropes only, but no drill or bolts, not really believing him. Mr Ai knew all the river caves because he was a fisherman who regularly dragged 2+ m catfish out of the caves and sold them for a small fortune. Discovering there are fish that big swimming in the caves with us was mildly concerning. We followed him up over a nasty spiky col, very slippery as in the rain, and up another whopping great hill to a large entrance up in the cliff line - Hang Chám Lang. A 10 m pitch presented itself immediately. I delight in creative rigging with insufficient gear, so I grabbed all the gear we had and charged in.

The first pitch consumed the 14 m rope and a tape off some handy naturals. 70 m of huge horizontal passage led to a flowstone blockage, but a human-sized hole presented itself, with a roaring draught, so Dave and I pressed on while the other three surveyed behind. A steep, bat guano-covered flowstone pitch was next. A couple of handy columns got us down that one on the 34 m rope (plus a tape for a rebelay on a micro-stal), with 15 cm of rope to spare. The draught blew us along the next bit of passage to a series of flowstone balconies over large passage with the sound of a healthy stream. The challenge was finding a way down off the balconies that would need 9 m of rope or less! Eventually I tied the last remaining tape to a small stall, extended it out in a single length to a carabiner then tied the 9 m rope in with a rope-saving barrel knot and headed down to see where we could get to. There was just enough rope to get your toes on the ground before the last of the rope pinged through your descender; I'd worry about reaching the rope for the exit later. We were still a long way from the stream and a convoluted zig-zagging route was eventually pioneered which got us to the river. Success!

Upstream was a massive sump pool with no obvious way on. We left a survey sheet with a note as a tie in point for the others and headed off downstream, surveying as we went. No wetsuit, no buoyancy, swimming, trying to survey – character-building. After a few hundred metres of swimming down flatwater canals a boulder choke appeared ahead. Dave then asked me possibly the strangest thing I've been asked while caving – 'can you hear music?' I dismissed his nonsense and suggested it might be his heartbeat. But sure enough, once I caught up, I, too, could hear a distinctive beat.



Photo by Unknown - The expedition team awarded with flowers



Photo by Peter McNab - Steaming hot model (!) in Hang Chám Lang overflow passage



Photo by Peter McNab - Hang Chám Lang stream passage

The choke had tree roots in it, so we knew we were near the surface, so we theorised that maybe we were at the blocked resurgence and the music was coming from the village. The others caught up to us at this stage and we had a good ferret about looking for a way through. The draught was coming from up, so we climbed carefully into unstable rockfall, with the music becoming clearer with every step. Eventually daylight was visible and we could slip out a narrow gap between boulders into jungle. Karaoke was blaring in the distance. Karaoke Chokey and The Sound of Music streamway were named.

Bonus Level

It was now time to draw straws. Some of us could pop out the new entrance, amble across the nearby fields then dawdle over the easy col to camp less than a kilometre away, but someone needed to reverse the whole cave to retrieve the ropes, relieve the guides from the entrance then trudge back out the horrid jungle trail the long way to camp. Becka, Snablet and I took one for the team and started swimming upstream. Part way up the flowstone terraces above the upstream sump Snablet looked left and saw wide open passage barreling off in the upstream direction. Well ... since we're here and it's only early afternoon!

We followed (and surveyed) large wet season overflow passage with occasional glimpses back to the active stream below. We then hit a junction and tried left first. It went a short distance to a ~15 m pitch to large stream passage which we couldn't find a way down without rope. Back at the junction we tried the other way and after half a dozen 30 m legs we left it wide open for the next day and turned our attention to suffering back up the sub-optimally-rigged pitches to the upper entrance. The walk back to camp in the rain and fading light was nasty.

The following day we split into two teams. Three of us headed back in Karaoke Chokey entrance to push the two leads we'd left the previous day while the others took the SUPs to some reported stream sinks. We took the big barreling lead first which went for several hundred metres until it popped out the other side of the hill into some random jungle. We got a GPS waypoint then headed back in. A short way back along the passage a climb into a side passage was pushed and this also led to entrances into the outside world, but this one was small and well-hidden part way up the cliffs. Evidently this made it a good spot to hide, as the chambers inside the entrance were littered with relics from the war – grenades, bullets, cable, fire pits etc. Very interesting. More cave to push though, so we headed in again.

Back at the main junction we were surprised to find a note from the other team at the tie in station. They'd headed round the hill, explored some swimming cave on the SUPS, then found a higher level which eventually intersected Hang Chám Lang not far from the junction. They'd been and gone while we pushed the other passage. We knew they didn't have SRT kits with them, so couldn't have dropped the 15 m pitch, so we headed over there. The excitement was short-lived, though, as we found a survey cairn and a sump not far from the base of the pitch, which proved to be the end of one of the stream caves pushed on the very first trip to this area two weeks prior.



Photo by Peter McNab - Hang Chám Lang overflow passage



Photo by Alan Jackson - Bullets and other war paraphernalia in Hang Chám Lang



Photo by Alan Jackson - A grenade in Hang Chám Lang

That was leads and enthusiasm exhausted for the cave, so we exited via Karaoke Chokey and traded notes with the other team who were already back at camp. The combined Hang Chám Lang system came in at just over 3 km long and 93 m deep.

Frog Soup

Probably the non-caving highlight of the trip occurred that evening, when a random frog jumped through camp and accidentally landed in the middle of one of our dinner bowls. The great thing was that the dish it landed in was frog stew! I'm sure the poor frog felt he was in a horror movie, swimming in a pool full of his friends and relatives' dismembered corpses. He hopped out soon after, probably more because of the chili in the dish rather than the realisation that he was in a frog cemetery.

Being Awarded with flowers (any Fawly Towers fans out there?)

On the fourth day we broke camp and called in to see the local Communist Party registration place where we'd been scrutinised on our arrival (any time you move to a new commune you have to produce passports and pre-arranged government permissions for that specific area). They wanted to show us a few other entrances near the village they thought we should check out on a future trip. We only had a cursory glance but they looked good. We then headed for Phong Nha, crunched some survey data then tarted ourselves up for the gala dinner. Lots of serious cave exploration and economy-stimulating speeches were given by various dignitaries and we were all presented with lovely bouquets of flowers. Hilarious.

Last Roll of the Dice

Adam Spillane and Dave left after the dinner and we were down to three cavers for the last trip out. The target was a cave pushed on the 1995 and 1997 expeditions – Hang Vom. It is a stupidly enormous and long river cave and at its upstream end the main stream emerges from a sump not far in from a dry overflow passage entrance. The sink for that water is about 5 km away, so in theory there's at least 5 km of mega-passage under the hill, so in 2009 it was dived. The sump proved to be short and shallow but the passage quickly terminated in a massive rockpile which the divers weren't keen to push hard in their dive gear. Earlier this year, Martin, who was one of the 2009 divers (and 1997 expedition members) was in the area checking some stuff for the Oxalis adventure tour that passes through the area and he had a poke around and found a sump bypass. It required rope to get down to the sump proper, though. We were to take a rope and have a proper push of the rockpile to see if it goes.

It was a long, leechy walk in, but a very pleasant campsite on sandy ledges atop large gourns overlooking the huge passage just inside the entrance. I can only imagine what it was like to have explored kilometre after kilometre of stonking river cave like this! Considering it was done with carbide, it was probably not as well-illuminated as it could have been. It was early, so we popped down to check the sump that afternoon. The rigging was pretty simple and we sidled down the muddy slopes to the toe of the rockpile. We tried over, through and under but never got any more than about 30 m into it. There was no detectable draught, even in the sump bypass passage, so we cut our losses and headed back to camp. The next day we slogged back out the leech highway and started the clean-up process, then, one by one, jumped on trains and planes etc. back to the reality of home.



Photo by Peter McNab - An ex-bat

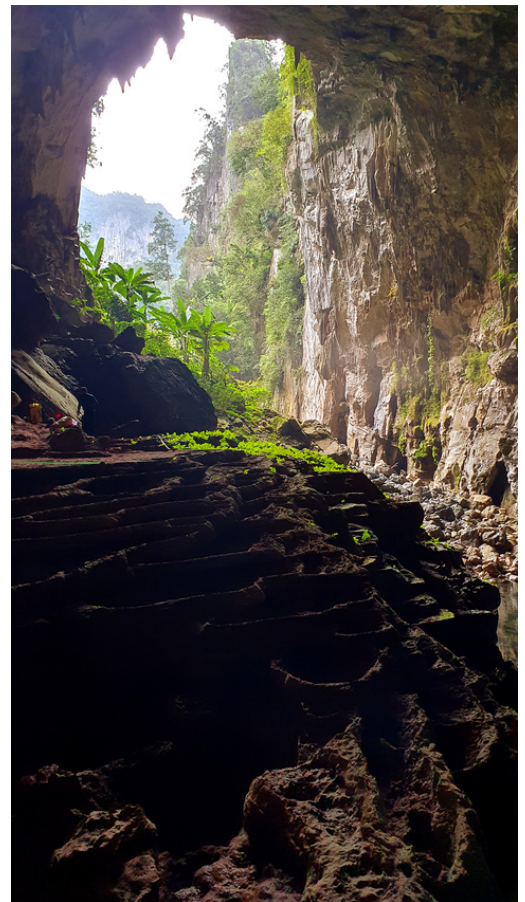


Photo by Alan Jackson - Camp in Hang Vom



Photo by Alan Jackson - Hang Vom - proper cave

The Wash Up

All in all, a successful expedition with 11.5 km of new cave explored in three weeks and I totally got back into the groove of expedition caving. Obviously there were some massive negatives from some team members' perspectives. Martin served his time and shook off his pneumonia but Gab will take longer to mend. He had more surgery back in Australia and had to fight off a serious infection thanks to the big gash. I really hope he heals up fully and gets his mojo back. Hang Chả Nghéo is wide open and waiting for the next expedition – I'd love to finish it with him.



Photo by Peter McNab - Cave exploration by SUP



Photo by Alan Jackson - Classic stream canyon in Hang Phá

Erratum, CA

#224, page 23

Stefan Eberhard

The article on Herberts Pot reported that listing of Herberts Pot and other Mole Creek caves on the register of the National Estate occurred as a result of a government study by Kiernan (1984). In fact the National Estate listing had already happened before Kevin Kiernan commenced his study while employed by the Tasmanian Forestry Commission. The author of the article apologises for the mistake in reporting the historical record, and not including the full citation to Kevin's study, which is:

Kiernan K. 1984 *Land-use in Karst Areas - Forestry Operations and the Mole Creek Caves*. Report to Forestry Commission and National Parks & Wildlife Service, Tasmania. 320pp. An abridged version was later published in 1989 as *Caves, Karst and Management at Mole Creek, Tasmania*. Department of Parks, Wildlife and Heritage, Tasmania, Occasional Paper 22. 130 pp.)

Kevin provided this additional background information as follows. In 1973 before Australia's National Estate system had even been established Steve Harris and Kevin Kiernan prepared a submission from the Southern Caving Society to the Commonwealth Government's Hope Commission of Enquiry in which they recommended greater recognition of karst values and the need for karst areas to be managed as systems rather than as isolated caves, and, that the Mole Creek area might provide a useful pilot site to try integrated planning across multiple land tenures/uses. The National Estate listing which eventually occurred a decade later was important because it was the first formal structural step along the path towards recognising the significance of the area that ultimately culminated in establishment of the Mole Creek Karst National Park.



Photo by Stefan Eberhard - David Butler in Holy Hell

Thampanna Unveiled

New Discoveries, Track and Route Marking

Megan Pryke

In 2018, an eclectic bunch of speleologists, with a copy of Ken Boland's survey [1], set off for a day trip as part of a Nullarbor expedition. After negotiating the pitch and clambering down through the entrance series, we found "The Drain" passage sumped, which was not unfortunate, as it led to the discovery of "Cryptography" by following the breeze. The initial assumption was that we had entered "The Crypt". However, further information revealed that we were in an undocumented passage. The knowledge of new leads motivated us to return. Over multiple expeditions, three kilometres of newly discovered and surveyed routes have been documented, and sensitive areas have been track-marked.

Thampanna's entrance is a pitch of approximately twelve metres, with a longer rope needed for rigging. A three-metre diameter vertical tube opens into a large chamber halfway down the rope or ladder descent. Rigging two routes for efficiency and safety is possible. We have been setting up a belayed ladder route and an SRT route that uses a thread part way down the upper tube. It is vital to secure your rigging at the bottom for safety. Apart from a theoretical risk of someone pulling up your gear while in the cave, you could find your rigging tangled by a strong out-flowing breeze when you exit the cave. Or worse still, find a rope flying above your head.

Apart from the pitch entrance, unless you only want to see part of the cave, you must crawl, stoop, thrutch and slither. Good knee pads are recommended! Although it is not an easily accessible cave, the rewards are a variety of passages with comfortable walking height sections, large chambers, challenging tube mazes and spectacular speleothems. Being in good physical shape and caving fit is advisable. As trips take a long time, kit to carry in and out includes a pee bottle, sufficient drinking water, reliable light sources and awareness of how much energy you need for the exit trip. Like many Nullarbor caves, it can be hot and sweaty, especially when travelling with the breeze.

It would be inappropriate to name one particular ASF club for the discoveries. Graham Pilkington (CEGSA) or Megan Pryke (SUSS) often organised the permit. Alan and Megan Pryke have been regular group participants.



Photo by Alan Pryke - Nullarbor Thampanna
The Cloudburst with Megan Pryke



Photo by Alan Pryke - Nullarbor Thampanna
Megan Pryke The Big Bamboo



Photo by Alan Pryke - Nullarbor Thampanna
Chandelier Fall Room

Alan has a penchant for mazes. He is a skilled cave surveyor. Alan's spatial and sketching skills have made him potentially the most prodigious cave surveyor in Australia. Thampanna was added to Alan's ever increasing list of cave surveying projects.

Cryptography is an approximately four metre wide alley that ends at a big rock pile. Before it terminates, a breezing lower-level tube leads to a maze of tube passages. Various caving manoeuvres are needed. Amongst the labyrinth, a climb up led to upper-level decorated chambers. Alan named the area the Jungle due to the forest of halite. Features include "The Big Bamboo", a chandelier of halite straw columns in "The Jungle". "The Cloud Burst" is another halite column formation with straw columns representing streams of rainwater poking down from a small "cloud" of halite. "The Canopy" is a room with tall, white halite columns each with its own character and is accessed via "The Jungle".

Another Alan-led team located a new southwest, northeast route at drain level. Along the way, there are tight delights. "The Combination Lock" and the "The Code Breaker" may stop larger cavers. Other named passages are the "Rocktopus Room", the "Sandy Slither" and "Pay Dirt Passage", then a pleasant surprise, a significant chamber called the "Bamboozle Breakdown".

Beyond "Bamboozle Breakdown", the route was carefully negotiated to minimise disturbance to "coffee" deposits. A drop down from the rock pile level led to a gypsum-encrusted, mud-cracked floor that continues to the "The Chandelier Fall Room".

There are a lot of wows in this area. Our survey as you go led to a rockpile link to the Boland survey in the aptly named "Muddle" and previously known passage. Even when you know or have a map, it requires muddling.

A route and track marking project has been established to protect cave sediments from unnecessary traffic and delicate areas from breakage. A deposit known as "Coffee and Cream", though sometimes just "Coffee" does not recover from disturbance. The Boland survey notes an unentered room with "coffee" deposits. We surveyed this room using DistoX, set up a barrier and established reflective markers along the more spacious route.

The reflective route marking intent is to assist in navigation and confine impact; however, it should not replace using navigation skills, a compass and a map to negotiate the cave. Any trip will take several hours and requires good caving fitness. The route markers do not start from the entrance chamber, to limit the risk of casual cave visitors venturing far into the cave. There are yellow-in reflectors and white-out, which follow a protocol established in other Nullarbor and West Australian caves. There is a mixture of aluminium discs, plastic pegs, string lines, and guidance signs. We did not establish a reflective route along all the discovery trails (for example, via the "Combination Lock" to the "Bamboozle Breakdown") as it is not easy. Also, track marking along the "Sandy Slither" could be washed away.



Photo by Alan Pryke - Nullarbor Thampanna
Mark Sefton in The Canopy

“The Drain” remains the quickest way to get to the extensive northeast sections of the cave and is the most robust. The first chamber after “The Drain”, I decided to name “Kneely Wear”. This chamber is where reflectors start for the previously established reflector route to and from the eastern most extent, the “Crystal Dome”. We refreshed this reflector route replacing old red reflectors with yellow reflectors.

Navigating new areas requires negotiating small sections with no reflectors. We wanted to ensure other speleologists knew of the new regions rather than find themselves accidentally in these new areas. A reflector route along the Cryptography passage has been set for the highly unlikely event of the Drain filling with water whilst a party is in the cave.

A loop track near the “The Chandelier Fall Room” area guides speleologists past various speleothems, including “Dry Lightning”, a bunch of gypsum stalactites and examples of more familiar calcite stalagmites and stalactites. Beyond the Chandelier Fall Room is a reflector route to “Snowdomia”, a high collapse dome chamber with halite that looks like snow.

Covid19 travel restrictions delayed the project's completion. Plus, I underestimated the in-cave time required. One incomplete listed task currently needs to be completed. Replacing temporary flagging tape track marking to protect a passage containing “fine box work”. If you are up to the challenge and heading to the Nullarbor, contact Alan or Megan Pryke!

It has been a privilege to be amongst the first eyes on the various passages found. Thanks to the Karst Conservation Fund for contributing to the project's track-marking cost. Also, to WASC, who lent their vertical gear and provided additional reflective material and the many cavers who have helped.

[1] Referred to as the “Boland” survey for simplicity.



Photo by Alan Pryke - Nullarbor Thampanna
Megan Pryke track marking 1

"To live will be an awfully big adventure"

J.M. Barrie, Peter Pan



Photo by Nadine Muresan of
Edmund Muresan (4yo)
in "Mina din Dealul Crucii" -
The mine from the Cross Hill

DRIP HOLES (PITS) AND CONULITES (DRIP CONES, SPLASH CUPS)

Article and photos by Garry K. Smith
Newcastle and Hunter Valley Speleological
Society (NHVSS)

Have you ever taken notice of a hole in the cave floor sediments created by water drops falling from a stalactite? Some of these holes are shallow while others may be quite deep, depending on the distance the drops have fallen and the composition of the floor sediments e.g., sand, clay or guano. What do we actually call these structures? Not surprisingly they are typically called 'drip holes' or 'drip pits' (Fig. 1), however if a coating of a secondary mineral is deposited in the hole, then the resulting speleothem is called a 'conulite' (Fig 2). Typically, in limestone caves the secondary deposit is calcium carbonate (CaCO_3) in the form of calcite as this is the most stable polymorph. Conulites have also been recorded in lava tube and sandstone caves with various other secondary deposits coating the inside of the hole (Fig. 3).

If we first consider the creation of drip holes, it is important to realize that if drips are falling and impacting on pebbles or harder, more compact sediments, there is less likelihood that a deep hole will be created (Fig. 4). However, even shallow drip holes with hard surfaces just a centimeter or so below the cave floor, can support the formation of a conulite when displaced sediment particles are cemented together by CaCO_3 deposited from drip solution (Fig 5). On the other hand, the constant drip from a stalactite is likely to create a rather deep hole in soft guano, clay or sand (Fig 1). Typically, deeper drip holes are created by water falling from a high ceiling and the drop impact flings aside loose particles or drills a hole by compaction of the sediments on the cave floor. There may also be other processes involved, such as mechanical abrasion or dissolution by drip or ground water.

Over time conditions (drip rate and solution saturation) may change and deposition from solution may cement some of the sediment particles together and coat the inside of the hole (for part or all of its depth). The secondary deposit may also extend out onto the surrounding cave floor forming part of the conulite (Fig 2). Other names used in publications are drip cone, splash cup, hollow, cone-shaped speleothem, and in some French literature they are called an anti-stalagmite.

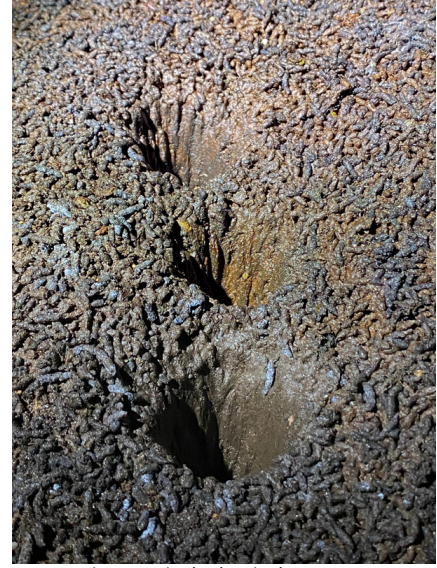


Fig.1 Drip holes in bat guano.
CB4 Cave, Comboyne, NSW

Conulites are usually small, ranging in depth from just 1 cm up to about 15 cm and have a wall thickness of a few millimetres up to 1 cm. However, conulites can be larger with some being documented with depths of 2 and 3 meters (Fernández-Rubio and Eraso 1974, 1975). Shallow depth conulites are just depressions coated in calcium carbonate and could contain cave pearls. An individual pearl may sit in its own 'cup' or a group of pearls may sit in a 'nest', so called because the cave pearls look like birds' eggs in a nest (Fig. 6).

Conulites often form as funnels or parallel shaped holes that become coated in successive layers of secondary deposit (e.g. calcite). Some conulites may have smooth calcite surfaces (Fig. 7) while others may be lined with jagged crystals or fluted erosion grooves. The cave floor directly surrounding the conulite may have miniature gour pools (Fig. 2). The layering of calcite inside the conulite may extend out and over the sediment or enclosing material surface (cave floor) surrounding the drip hole (Fig. 8), thus creating a flared trumpet shaped conulite. Sometimes, the mud or other sediments around a formed conulite is washed away and leaves the cone structure sitting proud of the lowered sediment surface (Figs 9 & 10). The conulite may then resemble a mushroom or tube and look out of place in a cave.

Variants to this may include conulites formed in sediment near a flowstone cave wall, then as the surrounding sediment is eroded away, the flowstone attaches to and cements the conulite to the growing flowstone (Fig. 11). This may leave a conulite looking rather out of place, attached to a flowstone wall some distance above the present cave floor.

Occasionally as a result of changes in drip water chemistry, a conulite may be eroded away by dissolution to create an unusual structure as in Fig. 12. However, these should not be confused with stalagmites that have been eroded away by changes in drip water chemistry causing dissolution of stalagmites (Fig. 13).

While conulites are not overly common it is worth keeping an eye out for them when next in a cave, so as to avoid accidentally stepping on one. Being aware of these speleothems can help to protect them.

Origin of the term Conulite

The term conulite was first introduced by Thayer (1967) who defined them as “simple drip-drilled mud pits... lined with calcite”.

Then Monroe (1970) described a conulite as, “A hollow, cone-shaped speleothem formed when a conical depression is drilled in cave mud by falling water. Subsequent erosion may remove the mud, isolating the calcite lining of the depression”.



Fig. 5 A shallow conulite with displaced sediment cemented together around the drip hole. Nice Cave (KNI050), Ningbing Range WA



Fig. 2 A 300mm deep conulite created in bat guano at Main Cave -Timor, NSW. It is lined with jagged calcite crystals, indicating the drip hole has been filled with water for a period of time



Fig. 6 A shallow conulite 'cup' or 'nest' containing cave pearls in Hennings Cave, Jenolan, NSW



Fig. 3 Iron oxides/hydroxides lined dripcup (Conulite) in a quartz sandstone cave near Horseshoe Falls, Hazelbrook, NSW



Fig. 7 A smooth sided calcite conulite is coarse sediment Bullita Caves NT



Fig. 4 Although the drips have fallen from some height, the resulting splash cup is only as deep as the mud coating on the underlying solid rock. Spider Cave, Jenolan NSW



Fig. 8 A small diameter 100 mm deep conulite drip hole in sandy sediment coated with calcite. Note the ring created by the droplets splashing back out of the hole after the drop impact. Woolshed Cave, Takaka , NZ

The definition was later expanded by Peck (1976) to include pits drilled in sand and gravel, then subsequently lined with calcite. Later authors found similar forms in moonmilk (Hill 1984), bat guano and massive gypsum.

The definition published in *Cave Minerals of the World*, 2nd edition (Hill and Forti 1997) describes a conulite as “a speleothem type which is hollow and conical and which forms as a drill-hole lining in mud, sand, or other soft material; subsequent erosion can isolate the crystalline lining from the enclosing sediment leaving it free-standing.”

Other possible conulite variants

If we look more closely at these definitions, it soon becomes apparent that there is scope for a wide range of possibilities. For instance, a stagnant cave pool could be coated in floating calcite rafts and a single drip keeps sinking the rafts under a drip point. A pile of rafts builds up as the pool evaporates or seepage drains the pool, leaving a mound of raft flakes. A hole can be created in the raft mound (raft cone) by a constant drip and subsequently lined with calcite deposition, including fusing together of the rafts to create a conulite. Hence one can imagine that there may be many other enclosing sediments which can be involved in conulite formation than those specifically mentioned in the definition provided above. Figure 14 is an example of a raft cone with a drip hole in the top, which given the right conditions could form a conulite inside (Fig. 14).

Another rather unusual occurrence is where corrosive drip solution creates a drip hole in limestone bedrock and then over time the drip chemistry has changed and deposits CaCO_3 to line the hole and surrounding splash area. Figure 15 depicts an example where corrosive drip solution has penetrated a crack in the bedrock to create a 10 cm deep drip hole, that has been subsequently CaCO_3 lined and created coralloids on the rock surface within the splash zone.

Other variants to conulites as detailed by Hill and Forti (1997) are ‘Cave Birdbaths’ and ‘Cave Fans’.

Birdbaths are conulites that have a low angle bowl-shaped lining of calcite formed like a conulite in a drip depression in soft mud. Their shape and growth are also influenced by water overflowing the conulite rim as occurs with rimstone dams.

Yongi (2001) reported that Rat’s Nest Cave near Canmore, Canada, “possesses ideal sites for conulites as it is floored with fine glacial mud and has high ceilings up to 40 m. The chasm below the High Point chamber has excellent conulites of the “bird-bath” variety. The long fall of drips causes a flattening and convoluting of the more typical conical form, and some have diameters of up to 20 cm.”



Fig. 9 A flared cone shape conulite with sediments eroded away Neighbours Cave, Bullita, NT



Fig. 10 A near parallel shaped conulite (≈50 mm diameter) with surrounding sediments eroded away. Note a new drip hole next to it. Liang Luar Cave, Indonesia



Fig. 11 A conulite originally formed in sediment, now attached to flowstone wall, 1 m above the present cave floor. KN1046 at Ningbing Range WA



Fig. 12 A conulite which has formed, then surrounding sediments eroded away while water chemistry has changed, causing erosion on one side. The present water chemistry appears to be again depositing calcite



Fig. 13 A stalagmite that is being eroded away by a change in water chemistry causing aggressive dissolution. This is NOT a Conulite.



Fig. 14 A cone of calcite rafts in Lake Cave, Timor NSW, with a drip hole drilled in the top. Given the right conditions this drilled hole could become a conulite. i.e. Fusion of rafts down hole and coating with calcite.



Fig. 15 A conulite in solid bed rock with coralloids in splash area. KN1195 at Ningbing Range WA.

Cave fans are typically developed in a high pit near a strong upward wind that contributes to evaporation of splash water forming the cave fans along subvertical walls (Grupo Espeleológico Esparta 1992). They have been recorded in a number of caves around the world including, Gua Ajais (Wonder Cave) and Tiger Foot Caves in Mulu National Park, Sarawak, Malaysia and Txomin VIII Cave in northern Spain (Brook and Waltham 1978, Grupo Espeleológico Esparta 1992).

Acknowledgement

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The Tilting Activities of the Conservation Commission

Clare Buswell

Is it simply the confinements of winter that gives thinking space so that those in power to dream up what else can be done to impact the caves and karst that we all love? These impacts, over the past few months, have included changes to the size and types of renewable energy developments, to thinking that shotcrete is the best way of holding eroding entrances of caves together, and germ warfare.

Here then is a short roundup of the current state of affairs.

Arrowsmith Wind, solar and now ammonia development.

This development I have mentioned previously (*Caves Australia 221*, Sept 2022). The proponent, Infinite Green Energy (IGE), has been told by the WA Environmental Protection Authority that it has to consult and address the issues raised in the submissions of the speleological community re the problems and impacts on the karst at Arrowsmith. In early July 2023, IGE contacted WASG asking them to attend a meeting, whilst at the same time, stating that cavers were the last on their list of stakeholders to consult, that time for consultation was running out, and, by the way, here is a map of what we now intend to do. The map had no scale or key, but lots of pretty colours, purporting to represent wind turbines, solar panels and processing plant infrastructure.

Ian Collette, and the WASG committee, very politely told them to come back with a written list of what IGE wanted to talk about. What is very clear, is that IGE have no understanding of the structural integrity or lack thereof, of the land they are going to dig up to place:

- 23 turbines, (no height of tower or generating power provided),
- An electrolysis plant, and liquid hydrogen storage facility,
- An ammonia production plant (this is was not in the original development proposal),
- Solar panel areas,
- Off-loading areas, and

The construction of a wastewater/salt emissions evaporation pond close to the entrance of River cave.

Further, this green renewable development will mean native vegetation clearing of 139.31ha, and with a total disturbance foot print of 242.28ha. This is all on karst, with impacts on known and unknown caves, cavities and drainage systems. This of course, doesn't matter.

What will matter - to IGE - is the possible loss of machinery and cost of its extraction, if or when it opens up a cavity! Only then will IGE begin to understand that they should have consulted speleologists before it even purchased the place. The WA Conservation Commission is also following up, but this is more about the above ground impacts, loss of vegetation, and associated habitats and water drawdowns.

Again, the Conservation Commission watches this development as, if it gains approval, then an awful precedent will have been set, no doubt influencing the Nullarbor industrialisation plans.

Senate Standing Committee and Green Washing

Whilst remaining in the washing machine of politics (it's never green), the Senate Standing Committee on Environment and Communications held an inquiry into green washing in relation to, amongst other issues, the environmental and sustainability claims made by companies in industries including energy, vehicles, household products and appliances, food and drink packaging, cosmetics, clothing and footwear.

The Conservation Commission made a submission to the committee, with reference to hydrogen energy developments on the Nullarbor, stating that its natural values will be destroyed, the construction of a massive renewable energy development. Such a development can only be a green washing exercise, given its location, in an area so far removed from any transport hubs and electrical grid infrastructure.

The Senate Standing Committee has retired to review the submissions.

Western Australia Aboriginal Heritage Act

The new WA Aboriginal Heritage Act, 2021 came into law, as of July 1, 2023 and the kick back from farmers and some of the corporate world is, as per usual, along the lines of the sky falling in. There is now talk, according to the *Weekend Financial Review*, of the WA government reassessing some sections of the new Act and its regulations, as the public outcry is supposedly affecting its re-election chances.[1]

Be that as it may, the Act applies to any land in WA bigger in area than 1100 sq metres, and uses a three tiered level of impact in assessing developments, each of which have set management regulations. The tier levels relate to the potential level of disturbance, from walking on defined tracks (low level, Tier one) to digging for construction or extraction of minerals, (high level impact, Tier three). Each level requires a permit and a management plan.

One of the most important changes to the Act is the inclusion of cultural landscapes, this makes the definition of Aboriginal Heritage more inclusive than only that of hard or tangible artefacts, as now both are included. Aboriginal people will determine what constitutes Aboriginal heritage.

The previous overseeing body, known as the Aboriginal Cultural Material Committee, has been replaced by a new entity, the Aboriginal Cultural Heritage Council. This council organises permits, consultation processes, management plans of sites found, and makes recommendations to the Minister. All parties can appeal to the Minister in relation to permits and plans. This deletes the notorious Section 18 of the previous Act that allowed everybody to appeal to the Minister, except those Aboriginal people whose heritage was involved.

This Act will have serious implications for the Nullarbor development as Aboriginal Heritage,- rockholes, flint, handprints - are scattered widely across it.

[1] Thompson, B. 'WA to Feds: Stay out of Aboriginal Heritage'. *Australian Financial Review*, 29-30 July 2023. p. 8.



Photo by Clare Buswell - Nullarbor Gems

Dipping into Shotcrete

Concerns over the stability of the slope leading to the Rubbish Tip entrance area of Dip Cave has resulted in consultants recommending the use of shotcrete to address the issue. This, slope instability combined with asbestos being found amongst the human detritus of bottles, boots and rubbish in the immediate entrance area, has closed the cave to all visitors. This latter action is reasonable, however, consultation requests from the NSWSC to offer alternatives have been consistently ignored.

Recently, the ASF supported the NSWSC's freedom of information request, or Government Information Public Access, (GIPA) as it is known in NSW, to obtain documents pertaining to the decision-making process followed by the management authority, NSW Crownlands. The resulting official papers included a geotechnical report that assessed the risks and costs involved from doing nothing, to analysing multiple shoring methods such as hydrophobic polyurethane grout, to galvanised steel wire mesh, to fibrecrete, to rock bolting, to stabilise the slope and hand extract the asbestos[2].

Whatever method is used to address these two issues will, of course, be dictated by cost, and as shotcrete comes out cheapest, expect to see it around the Rubbish Tip entrance of Dip Cave. One can only hope that they don't make the same mess of it as they did in a section of Kelly Hill Cave, South Australia, where they could not even be bothered to colour match it with the light colour of the rocks they supposedly wanted to stabilize.

Nullarbor

To conclude this summary of the Commissions activities, and in a moment of post COVID hilarity, I suggest you take a trip to your chemist and treat yourself to a rub of something Nullaborish. But when you do, send me a 3 word maximum slogan to save it from destruction by turbines and solar panels. The winner gets a prize. Can you guess what it will be?

[2]Peer Review and Risk Management Options, Wee Jasper 'The Dips' Cave. Unpublished Report prepared by SLR Consulting, for NSW Crownlands SDR Team. Crownlands, Department of Planning and Environment. NSW. SLR Ref: 660.30275-R01 Version No: -v1.0 March 2023.

NUCC TAKES ON THE JEWELS OF MOLE CREEK

Story and photos by Brittany Meers



Damien peering further
into Croesus

From the 22nd to the 26th of April, NUCC took a small trip to Mole Creek. Our team consisted of myself, Alex Motyka, Martyna Judd, Matthew Tobolov and some Tasmanian locals to be our guides: Damien Ivereigh, Bob Pennington and Jess Bayles.

Day 1

Around 8am, Damien showed up at the door of our air bnb, we worked out our plan to do Lynds and Croesus caves. We drove out to the river in the national park and hopped to it. After a bit of a walk, we waded across the river to the cave entrance.

As soon as I got into the cave, it was unlike anything I had been in thus far. Walking through some fantastic dark limestone streamway with a flowing river around your knees. There was a small pool that was quite deep in the middle. We had two choices, climb around the walls on the side or swim straight through the middle. Most of us chose to climb the walls but the waterfall that was running still made us a bit wet. After this was where the true sights began. There began to be more and more formation along the walls, we entered some large rockfall chambers that we thought were absolutely massive and worth all of the "woah's"... little did we know what we would be seeing over the next few days.

The ceiling in a small room was the first part that got me excited with beautiful straws around one metre long, and it kept getting better. Out came the cameras. We entered a room with a big flowstone bank where I thought, I'll take some quick happy snaps. Cue Alex posing in front of the flowstone.

Wandering upstream, we kept finding more decorations and were severely impressed. Matt decided to go for a slight swim in the river as he explored under some flowstone. We got all the way to the rock pile where the cave begins to constrict and we decided it best to turn around here and head out, we had more caves to go in. On the way back out, Alex brought out his nifty little 360 camera to test it out and how well it could capture a cave environment... alas... it would take us a little more practice with lighting to get a good picture. We then exited the cave for some lunch.

Croesus was the cave on the agenda for the afternoon. We were warned it would be a wet one and so we all prepared for this. Little did we know we should have brought more torches and batteries. When we entered, we found the huge streamway tunnels to be quite stunning. We tried out lighting up all the pools with head torches which would turn out some spectacular photos, but the process of setting it up took at least 30-45 minutes to get lights right and wait for the water to settle again. And once we would finish with one section, we'd walk around the bend to the next section only to stop and do it all over again. I think after the amount of times I yelled at everyone to freeze and not to move a muscle, everyone was about ready to take my camera and drown it. After we reached the "end" of the cave (continues in tighter passages) we decided to head back out as some of us were getting cold and batteries were running low. A successful first day was had with more to come.



Alex enjoying the ambience of the lit pools in Croesus

Day 2

First up for the day was Marakoopa 1 and 2. To this date, I'm still a bit confused as to which is which but, we had a good time regardless. We met up with Bob and Damien nice and early and headed out to the parks office to coordinate the timing with the tour group. We headed in before them and stood at the edge of the platform to look down at the rift we would be climbing down. To say I found it a bit daunting was probably accurate. Once we had moved through that, it was just some scrambling to the sump which we found silted up after the water flow through the cave. As was standard practice, we spent an hour shifting dirt and rocks to make a gap big enough to squeeze through and pushed onwards.

The main area of the Marakoopa streamway was very different to the other caves we had been in the day before. Lots of big rockfall chambers with large, but at times, fragile mud banks. There wasn't as much formation in this section of the cave but I suspect its still much more active than the other areas. We continued walking through the passages and we noticed it was quite wet... we asked Bob how high the water would be and he said there's not usually anything super deep as he and Matt stepped into a pool that ended up being waist deep. "Well... usually its not that deep", we decided that we could push on a little further before considering it too cold. We turned around after finding a nice little patch of shawls to get some good photos. The climb back up the rift was a lot easier than the climb down. Sadly, the national parks permit didn't allow us to see the rest of the tourist section so we headed back out, taking some happy snaps on the way. We all gathered back at the car for some lunch and to take off our wet suits for the drive to Genghis Khan.



Alex, Martynna, Matt and Damien admiring the formation in one of the large chambers in Croesus

The main chamber of Genghis Khan was very impressive with a big Stalactite hanging from the ceiling dripping down to the stalagmite growing up to meet it from the ground. I choreographed our lights and took some photos from the boot wash station and then we pushed on. On the way down in the chamber, Bob pointed out a small section behind a rock. What was there was something more akin to hoar frost on a small shrub! There were bright white tendrils growing in all directions, all culminating in a structure closer to an icicle than a stal. It was beautiful! It was difficult to get good photos but I managed to get a few to suffice, though they certainly don't do it justice. After some oohs and ahhs we continued to an equally impressive section, more helictites in the corners of the ceiling, bright white columns covered in coral bordering the path like pillars. Suffice to say, I was now very impressed. I did my best to capture photos but, you really just had to be there.

After more photos, we continued up a big slab that had dropped from the ceiling at some point... it was quite a flat passage, requiring hands and knees. It might have been a little daunting to think you were under a big slab that had already dropped a section off it but, the tell-tale signs of it being solid for a long time were visible as patches of bright straws and fragile columns reaching from floor to ceiling. The more you looked, the more details you found. After testing everyone's patience with photography, it was time to head out. Someone mentioned 'pub' and we were sold. A nice way to wind up a good day.

Day 3 – the beast of Kubla Khan

We were eagerly up early, prepared for a huge day underground. We met up with our guide, Jess, who generously took up her ANZAC day to take us through the cave. Alex and Damien headed off to rig our exit pitch and the rest of us started the walk up the hill to the entrance. One at a time we abseiled down the first pitch. I had my first encounter with a Tasmanian Cave spider which was easily the size of my face.



Reflections in the pools at the top of the Pleasure Dome in Kubla Khan

I soon forgot the giant spiders when I looked at the size of the first chamber. It was MASSIVE! They clearly make things big down in Tassie. The walls were lined with intricate flowstone and fine pillar-like stalagmites littered the rock pile floor. Jess laughed as I exclaimed that it was so bloody cool, "you're not even at the good parts yet" she replied. I knew my mind was going to be blown.

The funny part about Kubla Khan is that, everywhere you look, there is a feature that, on the mainland, would seem like the main attraction of a cave system, but not here, it was just a regular passageway. Continuing further down the final entrance pitch, we started the proper journey walking and scrambling our way along the roped path. We ended up at a section called the Khyber Pass, a crack going through a section of rock that has a good five meter slope below us, if you slipped, you were going to keep going for a while. We all got across without a hitch and Jess then pointed us in the direction of the Opium Den. Relax, we didn't do drugs, in fact, you really didn't need drugs here. The formations on the ceilings were more than enough. The sparkled like little black stars. Next to them were delicate stals that hung from the ceiling, covered in small pieces of cave coral, they almost resembled upside down Christmas Trees! After much ogling, we decided to move on, we still had LOTS of cave to see.

We followed the marked path and often detoured as it diverged to different 'look-out' sections. The next place we would come to was the Hall of Kings. A chamber your torch couldn't reach from one end to the other with stalagmites growing up all over the floor. Photos truly don't do this place justice, though we tried our best. Here we left our packs for a little while and headed down to the 'Silk Shop' and detrogged to have a look around. To date, the shawls here are the best I have seen in a cave. We changed into our clean clothes and walked across to an area of pristine gours and sparkling flowstone. There was no possible way to capture this in a photo as you were surrounded by things that glittered. As with every point in this cave, we could have stayed longer but time management is important in a cave with so much to see.



The Pleasure Dome in Kubla Khan, the last stop before the swim in the River Alph

Kubla Khan is like walking through a museum if it were super dark and required climbing. The journeys between 'exhibits' were just as fun as the displays themselves. The climb out of the Hall of Kings was aided by a handline, although a well-placed knee didn't go unappreciated. We were then told to sit and take a few minutes while Jess showed us one at a time, a place we could stand and stick our heads around a corner to see the 'Jade Pool'. The pool was only small but every wall surrounding the four square metre space was covered in untouched flowstone, with it trickling down and creating glittering borders around the green crystal pool.

Continuing, we entered a big collapse chamber with lots of scrambling over boulders, rivalling the best gym workouts you could have. We came upon 'Lunch Rock', the spot to sit and take a break, almost half way. As we sat, we looked over and were in the presence of 'the Khan' himself, a massive stalagmite, glittering with the calcite crystals in its stone walls. Alex decided to bring his disto along out of curiosity to check the size of some structures. With some very crude maths, he estimated the Khan to be standing around 20-25m tall. Jess then pointed out just past the Khan a taller "waterfall" of flowstone coming from the ceiling. She told us it was named the Begum, after the Khan's favourite concubine as it resembled her hair. We were then presented with an option, we could either follow the main path and spend extra time photographing the 'Pleasure Dome' at the end of the cave, or we could shorten that and take a trip to Xanadu. Needless to say we opted to see as much as possible, and I'm also a fan of the Coleridge poem that starts in Xanadu.

The scramble out to Xanadu on a bad ankle was not the easiest thing I've done, and I moved slowly. It was a large chamber filled with Stalactites, stalagmites, columns, straws, basically something to look at in every direction! Whilst the rest of the country has all these formations, the one thing that you can't be prepared for in Kubla Kahn is the size of everything. Every photo I took, I tried to have a person in it to show the scale, but even then, it doesn't portray the endless voids of the halls. We headed back onto the highway route and got to Sally's Folly pitch in the middle of the cave, which Alex rigged, in true canyon style, with a Munter Mule Overhand.

This led us down to Sally's Folly, a passage way filled with water in places and thick mud in others. There was a section requiring a bit of a climb around the edge of a pool to avoid getting wet and cold. We got to the climb up out of the passage, you could choose a squeeze or to step around the outside of a stal over the three meter drop to the rift below. We managed this and entered 'The Forest'. Containing similar structures to those in Xanadu, the Forest was just in a smaller room, making you think you were walking through trees upon trees, very hard to capture as a photo sadly.

We came out of the Forest into the top of Cairn Hall, with the mighty Cairn Pitch looming below us. Standing on the platform, we could hear the healthy churn of the River Alph below. For some, it was a nice sign we were on the exit path, for others, a large reminder of how long they had been holding a full bladder for the past several hours. Once we were all down the pitch and the rope was pulled, we headed on to the last sight-seeing stop for the cave.

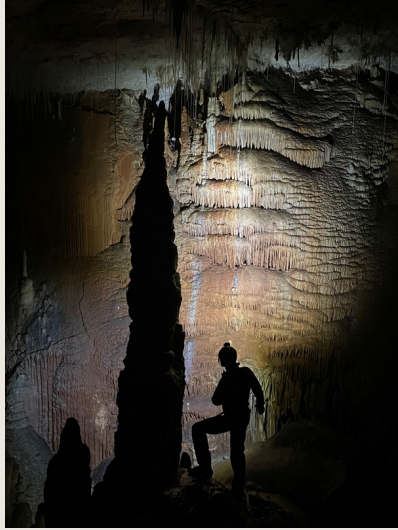
We scrambled up onto a rock and did the carefully planned dance of getting muddy gear off and stepping onto the clean mat to put the clean shoes on we had carried from earlier. Once done, we scrambled up several gours to a large room filled with rimstone as far as the eye could see, The Pleasure Dome. The wall on the right was covered in flowstone and presented some small shawls on an overhang to a small pool. I have been told we were lucky to see water in the Pleasure Dome as it's usually quite dry. I am happy to report that several of the pools were filled with water. As the rest of the group started exploring up the back corners, I started scoping out some potential photos. Trying to be respectful of everyone having their chances for their own photos and sights I finally asked if I could shout some directions.

"Yep, Jess, stay right there, headtorch just a little higher.. YUP DON'T MOVE!"

"Matt, can you make your torch brighter please and stop it riiiiiiight THERE!"

"Damien! Look away from me! Yes, better."

"Martyyna, perfect where you are and Alex can you light that back corner... little more to the right... yup that's it! Alright everyone, DON'T. MOVE. A. MUSCLE."



Alex making his way down from the Ridgeway to the Silk Shop in Kubla Khan



A shawl pool in the Pleasure Dome, Kubla Khan

Matt enjoying the beauty of the Croesus streamway

This was the dialogue that was most used for this whole trip. Once I had waned everyone's patience, we decided it was time to move on.

We got back to the detrog rock and prepared for the less pleasant part of this trip. Past groups had always used the Stalagmite Shuffle route that went along the walls a fair way above the River Alph, but it was a very exposed and sketchy route that isn't recommended anymore. We planned for this and had all brought a wetsuit for a more refreshing swim to the exit gate. The climb up to the gate was quite a steep flat one with not many features at the end, so a handline is permanently rigged to help. We exited the gate and the thought occurred to us that, in this large cave that is a pull-through trip, you would not want to forget or lose your key, apparently there had been an incident of that type in the past.

We were on the way out now. We had hoped we'd be lucky enough to catch some daylight in the exit chamber as the large staircase would make a very impressive photo being lit by rays of sun. Alas, we had spent around 9-10 hours underground and we could see the tiniest tinge of dusk. We got to the rope at the bottom of the pitch. I looked down and had a moment of startle as there was a nice stripey, scaled creature at my feet... a snake, but the poor thing had clearly fallen in the entrance and succumbed to the cold and dark. The pitch was uneventful, though we all took the time to navigate and then poke fun at Alex's rigging. I got to the top and watched the last of the daylight fade from the sky to the point I had to turn my torch back on... it flashed several times. Sweet! The second-hand Scurion had lasted the full day without a battery change. We all wandered back to the cars and chowed down on some celebratory chocolate. The rest of the trip was the standard packing up and flights home.

NUCC would love to thank our local guides who were so kind to show us their stomping ground, Damien, you put up with our nonsense for 3 days and still seemed to enjoy our company. Bob, thanks for taking us through Marakoopa and Genghis. Finally, to Jess, who took her public holiday to put up with our faff and awful jokes and singing to take us through Kubla Khan, what I can now say, is the most impressive cave I have done to date. (Also, a big thanks to David WC for putting us in touch with Jess whilst everyone was over in Ceduna for the ASF Conference).

We also would love to thank the larger bodies that made the trip possible: The Northern Caverneers for our guides and letting us use your equipment, and to Tasmania Parks and Wildlife Services for approving our permits and for the continual management to protect the stunning caves of Mole Creek.



The beautiful collection of shawls in the Silk Shop, Kubla Khan

PROJECT: PANNIKIN PLAINS PUSH

Story and Photos by Ryan Kaczowski

A quick glance at this title might make you think I like a little bit of alliteration, and you would be right. I thought it might be of interest to some to write up a short article about Pannikin Plains Cave as there has been plenty of dive activity in that cave more recently. What is it like and what about current exploration?

Pannikin Plains Cave is (by far) my favourite high plains dive site and for good reason. The water is the typical, clear, Nullarbor blue that you experience across the Nullarbor cave diving sites, and with seemingly endless visibility (as far as your torch can handle). To say that the passages are massive is an understatement, and I doubt that a single person isn't blown away when diving it for the first time – even within the first 100 meter of sump one. Plus, it just gets bigger! These things aside, the real gem for me is the vast amount of more complex side/perpendicular passages that seem to intersect the main conduit and become worthwhile dives on their own. 10 days diving there isn't enough.

Many of the high plains caves were known about very early on, but it wasn't until the early 1970's that pioneer explorers began to use the equipment of the time to explore these amazing sites, and Pannikin was one of them. A small amount of line was run and the early trips proved that this cave wasn't going to end too soon. Most notable was the 1988 trip led by the late Andrew Wight who, with a team of experienced divers, put in an amazing effort to push the cave beyond the 'Concorde Landing' dry chamber to its diveable penetration limit. This trip ended with a very unfortunate storm which funnelled millions of litres of water into the cave – while the team was still inside. Rocks were loosened and the cave collapsed at an internal choke causing 15 cavers to be trapped inside.

Fortunately, no one was seriously injured and two cavers were able to find their way out, to assemble a team that would safely rescue all members of the team unharmed. Andrew captured much of this expedition on film and subsequently made a documentary about it entitled 'Nullarbor Dreaming'. It is a great watch (45 minutes), and can be viewed online at <https://caves.org/avlibrary/nullarbor-dreaming/>.

This documentary helped launch his career in film, which included working with people like James Cameron. It was in fact his experience in Pannikin which inspired parts of the 'Sanctum' movie narrative. She goes!





Surfacing at Concorde Landing after a kilometer of sump 1 magic.



Bruce peering into massive tunnel. It just sucks up your light!

Unfortunately, after this event, the cave was deemed unstable and too dangerous for the general cave diver and was closed until further notice. Limited exceptions with strict permit conditions were made for particular dive teams that had the necessary skills and research interests. During this time, huge efforts were put in over many years to extend, map and survey the cave by teams led by the likes of Chris Brown, Tim Payne and Dave Fielder. Research into cave flora and fauna as well as the stability of the cave was also done by Stefan Eberhard. The effort by these individuals and others helped lead the way for the cave to be reopened to cave divers with suitable qualifications.

After entering the doline, you carefully wind your way down through rockpile via an SRT pitch to a small plughole before it opens up into a large long lake chamber. Care must be taken to minimize disturbance to bat colonies and string lines ensure you keep to a common trail, maintaining cave conservation as much as possible.

The dive begins by a descending straight down to 20 m where you are met by a large right then left-hand bend. You find yourself in a big 'canyon' like passage with a ceiling at around 20 m (water depth) and a floor near 40 m. After several hundred metres the cave heads upward through various collapses and small air bells, into 'Concorde Landing' - a large dry chamber around 1 km in from the entrance lake. From here you portage your dive gear a couple of hundred metres over to sump 2 including floating across lake in the middle. Sump 2 definitely does not disappoint. It is huge, and even with mega hi-lumen video lights supplied by TFM Engineering, rooms like the Giga-Passage are still left dark. The original 'end of cave' terminated at a boulder collapse where the still large passage abruptly ended.

In 2016, I was fortunate enough to be invited to join a trip with Dave Fielder, Chris Brown and Chris Edwards and my mind was blown by this incredible cave. While the cave has so much passage to explore, my mind was fixed on extending sump 2 past its end, either wet or dry. It turned out to be the latter. I was able to 'maneuver' my way through a series of small restrictions to surface in a rather small lake. Initially a little disappointed,

I climbed out and through a rockpile which opened straight up into a big dry chamber, with a large pyramid like hill to climb over. It was named 'Chapel Hill' and immediately I went to work looking for water on the other side. It wasn't easy but a small sump 3 lake was found and I squeezed through into a small room at about 12 m water depth.

In 2017, myself, Stephen Fordyce and Stefan Eberhard put in a big effort to push this third sump down into a fissured passage with small side leads. Not the booming passage we had hoped for.

Both myself and Steve had too many other projects and obstacles over the coming years to return, but Steve decided it was time to organize another push. That brings us to this April just gone. Steve had crunched the survey data and thought that we may be looking in the wrong spot to find the continuation of the big stuff - the 'Holy Grail' passage. Together with Aussie divers (Stewart Donn, Andrea Russo, Chris and Aimee McCran) and internationals (Bruce Clulow and Skanda Coffield-Feith) we gave it another crack.

Over the next two weeks we sent pairs of push divers forward to Sump 3. Steve did the lion's share of pushing, laying a couple of hundred metres of line in nasty, silty, windy passage. A sterling effort indeed! However, we were still unable to break through into the big ongoing tunnel... Yet. The cave does not stop. We just need more time out there.

All push divers used differently configured KISS Rebreathers to get to Chapel Hill and open circuit for the sump 3 push. All diluent, safety tanks and bail out cylinders were filled with 32% nitrox.

Is it there? Who knows?

Will we find it on a future trip? Hopefully.

These questions are unknown but one thing is for sure, it won't be our last trip. It is waiting for someone for whom the darkness beckons.