

The Journal of the Australian Speleological Federation Inc.

CAVES

AUSTRALIA

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LAOS-VIETNAM
EXPEDITION

UNDERWATER
PALAEOLOGY

CAVING
BENEATH THE
RANGE

CAVES

AUSTRALIA

CAVES AUSTRALIA

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REQUEST FOR ARTICLES 2024

OCTOBER

ISSUE DATES FOR 2024

FEBRUARY, MAY, AUGUST, NOVEMBER

MAGAZINE SUBSCRIPTION

DIGITAL *CAVES AUSTRALIA* IS INCLUDED WITHIN ASF MEMBERSHIP FEES.

COVER: BRIAN EVANS IN (KNI168) SPOOK THE OWL CAVE - NINGBING RANGE WA - GARRY K. SMITH



Shades Of Death, Murrindal - Photo by Nadine Muresan

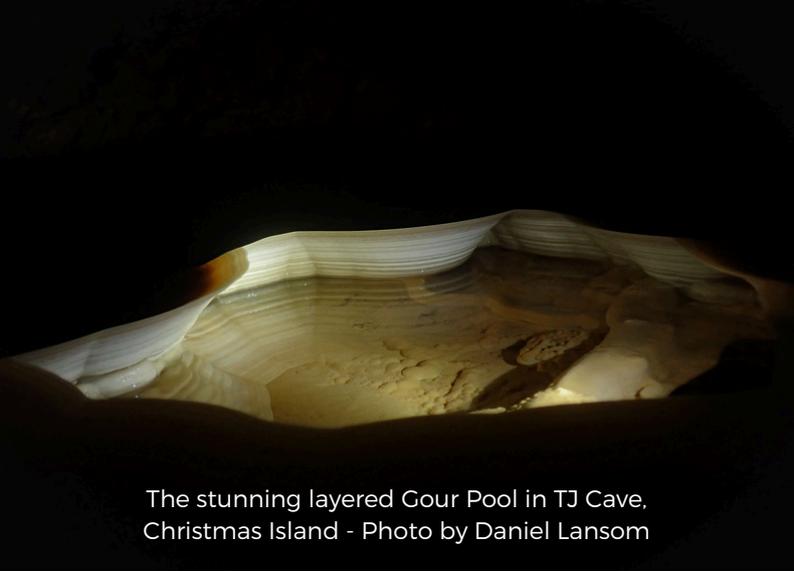


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Lilith Stewart in Westmorland Cave, Mole Creek TAS -
Photo by Nadine Muresan



The stunning layered Gour Pool in TJ Cave,
Christmas Island - Photo by Daniel Lansom

Editor's Note



Nadine pushing through Elk River Cave, Buchan - Photo by Bogdan Muresan

It's great to see so many things happening in the caving world within Australia.

Sarah talks more about the presentations, but the most recent being positive publicity from STC, listening to Henry Garratt talk about working and surveying in Delta Variant. This can be watched at;

<https://www.facebook.com/ciara.smart.9/videos/1034456821477699>

Cave rescue exercises are running in almost every state, which is fantastic to see as it means we have a lot of people with skills should we ever need to call on them in an event. Jemma Herbert is running the annual STC rescue on Saturday, 19 October 2024. Daniel Lansom ran a multi-agency rescue exercise in Margaret River (Witchcliffe Caving area) in WA on 24th August. Bogdan Muresan is running another event in Buchan Victoria over the first weekend of November. Feel free to get in contact with your state to see when the next event is being held.

The conference is coming along with new details coming out regularly. At this stage there is a BIG call for abstracts. Without presentations, a conference is hard to run. So please contact the organisers as soon as possible.

This *Caves Australia* has some brilliant articles and I do love hearing about everything that is happening. Looking forward to the next *Caves Australia*. Until next time, let's go CAVING!

Nadine Muresan

President's Report

The ASF has launched our '[Friends of ASF](#)' which is open to anyone cave-curious - be they scientist, conservationist, outdoor enthusiast, rescuer, overseas caver, retired caver or yet-to-be caver. We welcome anyone wanting to learn more about caving and exploration in Australia, and to keep informed about cave conservation issues.

A recent highlight was the Nullarbor information and awareness raising event held online in June. The session celebrated the caves and untouched landscape of the Nullarbor and their unique scientific values. The event hosted talks by Drs. Majtej, Liz Reed and Clare Buswell and the screening of *On The Line, Nullarbor* produced by Sil Iannello and narrated by Dr. Richard Harris - a film which highlighted the threats to this magnificent karst region from large scale industrialization. The event attracted over 130 participants from a broad section of the general public as well as ASF affiliated cavers. For those that missed it, a recording of the event is available to view [here](#) online.

Some of our members have been in the media recently highlighting their exploration projects and underground discoveries. Ciara Smart (STC) featured on ABC Local Radio talking about her passion for cave exploration and the Delta Variant project, which set the Australian cave depth record at 401 m in 2022. Richard Harris (CEGSA) featured in his documentary film *My Underground World* that was screened on Channel 9, showcasing cave diving in the Mt Gambier region of the Limestone Coast, with stunning cave diving footage and uncovering of the fossil treasures within.



Photo by Dee Trewartha

Unfortunately, there have also been a couple of cave rescues in the media also over past few months - in Bungonia and the Rockhampton regions, where local emergency services were called to assist injured cavers. With lots of caving trips planned around the country it's a timely reminder that rockfalls and accidents can happen and to be prepared for the unexpected on trips by having emergency plans in place.

We thank all the emergency services for being there when needed, and for maintaining a high level of cave specific training. The NSW Cave Rescue Squad undertook a training exercise in Bungonia, with their expertise called upon in the recent rescue in the area, and STC members have been assisting with training of cave specific techniques with the Tasmanian Police Search and Rescue team.

Wherever you are in Australia stay safe and have fun on your next caving adventure, or the next best thing, to sit back and enjoy a read of the latest *Caves Australia*.

Sarah Gilbert



The 2025 Caving in the Moonlight 33rd ASF Conference is now OPEN for registration!

Caving options for pre, during and post trips 10th Jan - 20th Jan

We have been working hard on putting together programs, maps and running sheets for the caves we intend to run before, during and after the conference. We will have a range of caving options from the beautiful tourist Buchan Caves, old show caves, easy caves, caves that require SRT and then special advanced caves with roof sniffs and water. A more detailed description will come out in the next circular, however, here is a starters list:

- Fairy Cave
- Federal Cave
- Lilli Pilly
- Murrindal
- Shades of Death
- Wilsons Cave
- Dicksons Cave
- Honeycomb
- Slocombs
- Elk
- Scrubby
- Dalleys

Abstract Submission

The ASF Conference covers a wide range of subjects related to Speleology. Should you wish to participate please add your title and short abstract below OR send directly to asfconference2025@gmail.com attn: Abstract.

Submissions are due by the **1st December 2024**. A conference is only a conference with presentations. So please put forward your abstracts as soon as possible.

The Cartography Salon is an exhibition of cave and karst-related maps. There is no restriction on method of presentation and innovative techniques are encouraged. However, the maps should be presented in printed format at the original scale. There will be a 3D category where maps can be presented digitally if such maps are registered. This category will be judged and rewarded separately from the 2D printed category. Judging occurs at the Conference.

<https://www.asfconference2025.com/general-9>

Registration

Please book your early bird registration online, remembering this pricing includes all the awesome presentations, delicious food, a T-Shirt and much much more!

<https://www.asfconference2025.com/booking>

	THURSDAY 9th	FRIDAY 10th	SATURDAY 11th	SUNDAY 12th Day 1	MONDAY 13th Day 2	TUESDAY 14th Day 3	WEDNESDAY 15th Day 4	THURSDAY 16th Day 5	FRIDAY 17th DAY 6	SATURDAY 18th DAY 7	SUNDAY 19th	MONDAY 20th
Morning 1		PreConference CAVING	PreConference CAVING	PreConference CAVING	Welcome presentation Talks/Posters	Talks/Posters	Activities Day	Talks/Posters	Talks/Posters	SPELEO ACTIVITIES	Post Conference CAVING	Post Conference CAVING
Morning 2												
Afternoon 1				Registration open		CAVING		CAVING	SPELEO ACTIVITIES	CAVE RESCUE		
Afternoon 2				Welcome BBQ	Scientific posters				Cave diving demonstration			
Evening	Debrief for caving				Evening Activity	Evening Activity-Get to know your ASF Exec & Commissioners	Evening Activity	Evening Activity	Evening Activity	Cavers Dinner		

FOOD FOR THOUGHT – ASF ANNUAL COUNCIL

MEETING PROCEDURE

Denis Marsh

To be clear, nothing in this ramble is meant or should be taken as a criticism directed at the Executive Committee of the Federation, but rather is offered in the interest of better governance of the organisation which is seen as a responsibility of the Federation as a whole.

Some 54 years ago, an editorial appeared in an ASF quarterly Newsletter, duplicated below:

“ASF NEWSLETTER – NUMBER 48 – JUNE 1970
EDITORIAL

AT THE LAST COMMITTEE MEETING OF THE ASF IN MELBOURNE A NUMBER OF IMPORTANT PROPOSALS WERE INTRODUCED AND DISCUSSED AND DECISIONS WERE TAKEN WITHOUT ANY PRIOR CIRCULATION.

IT IS THE POLICY OF THE FEDERATION THAT MATTERS NOT ON THE AGENDA MAY BE DISCUSSED BUT NOT VOTED ON. THIS IS A SOUND POLICY FORMULATED TO AVOID JUST THE SITUATION WHICH STILL SEEMS TO BE OCCURRING WITH INCREASING FREQUENCY EVERY YEAR, DUE TO A VERY LIBERAL INTERPRETATION OF STANDING ORDERS.

IT DOES NOT SEEM REASONABLE THAT THE MERE APPEARANCE ON THE AGENDA OF AN ITEM SUCH AS THE REPORT OF AN EXECUTIVE MEMBER SHOULD BE AN OPEN SESAME TO ADHOC DECISIONS WHICH DEPART RADICALLY FROM ESTABLISHED FEDERATION POLICIES. AN INSTITUTION WHICH HOLDS REGULAR COMMITTEE MEETINGS ONLY ONCE A YEAR CANNOT AFFORD TO MAKE HASTY DECISIONS.”

This would appear to be a sound principle for the conduct of AGMs attended by Councillor representatives of the various Corporate member clubs of the Federation. I am unaware and would be surprised if this policy has been deliberately abandoned.

Having attended numerous Council meetings representing my club over the past couple of decades, I have disturbingly witnessed this situation continue to arise on occasions, such as the most recent Council meeting conducted via Zoom last January 2024. I accept that many decisions of the Council are merely procedural and club delegates generally have some discretion to vote in the manner they feel confident represents their respective club's position. However, some matters raised in Council meetings warrant circulation to member clubs for consideration in advance of decision making, so that delegates can be given direction by the club's they represent on how they should vote.

Matters without notice which may affect how the Federation operates or behaves, can place delegates in the uncomfortable situation of second guessing the position of their club members they represent, or are forced to abstain from any decision. Such decisions can lack the benefit of a wider debate by broader club memberships or their committees. All too often ad hoc motions without notice are poorly worded and although well intended, may lead to hasty decisions with potential for unforeseen or unintended consequences.

I was surprised at the last ASF Council meeting that only two club delegates, abstained from a decision of the Council which added an additional unplanned \$10,000 expense line item to ASF's forward budget. The motion was recorded in the Minutes as follows:

Resolution 6: “That ASF put \$10000 towards an honorarium for a National Heritage listing nomination of the entire Nullarbor.”

That resolution was followed shortly thereafter by another ad hoc motion without notice which committed the Federation to an additional, this time unspecified, financial liability:

Resolution 7: "That ASF engage a campaign manager for the Nullarbor campaign."

Both motions had merit and were undoubtedly well intentioned but significant expenditure liabilities as these have implications for ASF's bottom line and budget planning, and potentially on membership fees. With membership fees set at the January Council meeting coming into effect from the following ASF financial year commencing 1 September, forward budget planning is critical. It remains for the ASF Executive now to consider and explain how these unplanned liabilities will impact and be covered in the Federation's forward budget.

It may have been just my confusion but the discussion leading to Resolution 6 appeared to suggest that the ASF commitment of \$10,000 towards an honorarium would be funded from the Karst Conservation Fund (KCF). I may stand corrected if I am wrong, but I am of the understanding that the Council cannot direct how expenditure from the Fund is allocated, rather all project funding must be approved by the Fund Directors following consideration of a formal application. It may well be that the Executive, or an officer of the Federation, has since or will indeed lodge an application to the KCF for funds to meet this financial commitment however the motion does not say this expenditure is contingent on ASF securing such funding. Regardless, it must appear in the Federation's next Annual Financial Statement as a liability. The full extent of the liability associated with Resolution 7 remains to be understood and is a question for the next Council meeting.

I understand that we all lead busy lives and are all volunteers, but all Commissions should endeavour to meet report deadlines for circulation prior to scheduled Council meetings, particularly if any recommendations are included in reports. It is unacceptable when reports, including Annual Financial Statements, are circulated just days before or on the day of a Council meeting.

I would like to call on the Executive Committee of the Federation to reestablish and enforce the principle of not allowing any decision to be taken in Council meetings on significant items raised without prior reasonable notice to the full membership of ASF. It should be incumbent on all members of the Federation to notify all significant agenda items in advance of Council meetings.

Similarly, I request that the Executive circulate a forward budget plan with a recommendation for the subsequent year's membership fees, sufficiently in advance of the next Council meeting to allow consideration by Corporate member clubs. This I consider is a primary function of the Executive.

Decisions on matters raised without notice should always be deferred to the next Council meeting or alternatively at some later time frame which can allow for an electronic vote by Corporate members, following circulation and reasonable consideration of the matter. As the editorial in *ASF Newsletter #48 - June 1970* stated, an Association which holds committee meetings once a year cannot afford to make hasty decisions.

Underwater palaeontology in the Mt Gambier caves and sinkholes

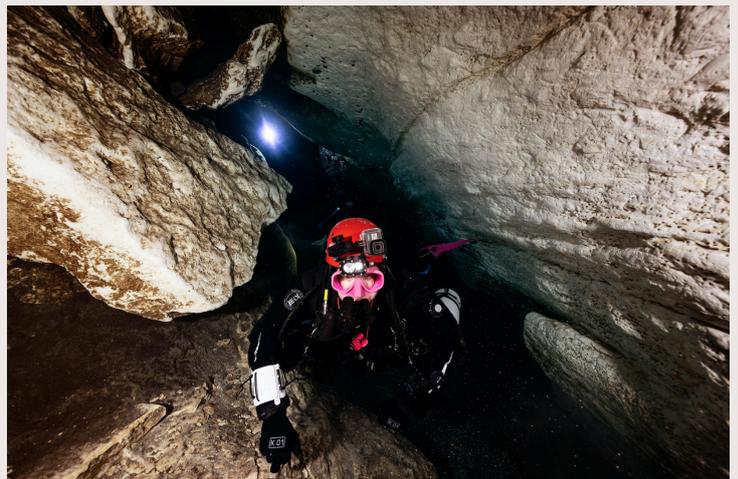
Julien Louys & Joseph Monks

For the last two years, our team of researchers and cave divers have been working in the Mt Gambier caves and sinkholes undertaking cutting-edge underwater palaeontology. Although fossils have been known and collected from these caves for decades, our team has been able to undertake sampling of the critical contextual information associated with those fossils. We were fortunate to receive funding from the Australian Research Council Linkage Project scheme, and our collaboration between Griffith University, University of Adelaide, University of Queensland, the Cave Divers Association of Australia, the South Australian Museum and CENIEH has yielded exciting new discoveries and insights into past ecosystems and the caves that host them. It all started with conversation between palaeontologist and cave diver Julien Louys, and then National Director of the CDAA Pete Wolf. We wanted to know more about the fossils from these underwater contexts, as well as providing more information to the cave divers about what they mean, where we might find more, and the best way to preserve them and the caves in which they're found.

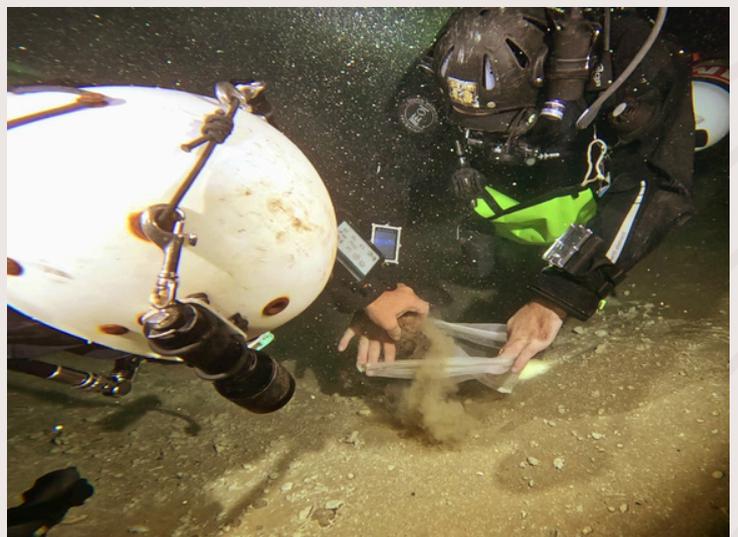
Some of the exciting discoveries we've made have been presented to Cave Divers Association of Australia through presentations at state and national events, as well as their *Guidelines newsletter*, but we welcome the opportunity to share some of our initial results with the wider caving community in Australia. The underwater deposits of Mt Gambier have been known to host a range of Australian megafauna species. These range from the characteristic extinct short-faced kangaroos (sthenurines), as well as the spectacular marsupial lion (*Thylacoleo*), and some of the largest marsupials that ever existed, the diprotodontids. In our last trip, we recovered extremely rare limb bones of the so-called marsupial tapir, *Palorchestes*. We have removed these bones from the surfaces on which they have been resting for tens of thousands of years so we can undertake closer studies of them. This includes trying to recover ancient proteins and DNA from the bones, as well as gathering palaeobiological information through stable isotope and histological analyses. Such analyses will hopefully shed light not only on how these animals lived and why they became extinct, but also how they got into the caves in the first place.



The team in 2023 - Photo by Steve Trewavas



Navigating through cave passages - Photo by Steve Trewavas



Collection of underwater fossils - Photo by Damian Bishop

One of the key questions we have is whether these animals were deposited in wet or dry settings. In other words, did the animals die in flooded settings and have been lying underwater ever since, or were they exposed to repeated wetting and drying events. A PhD student, Meg Walker, is focusing on these taphonomic questions, and will be probing the bones from the macro to the nano scale, using everything from callipers to synchrotrons to examine how water affects bone. Her work has involved looking at more recent (i.e. introduced) mammals in the sinkholes, such as pigs, sheep, and cows. Some unexpected finds came our way even with these species – we have radiocarbon dates of sheep that could date to as early as 1740! We've also recovered 800-year-old dingos that will be genetically analysed.

We have been collecting various geological samples underwater to try to narrow down the when of the megafauna. This includes classic techniques such as radiocarbon dating, but also techniques that allow us to date things further back in time, such as uranium series dating and luminescence dating. The latter require us to take cores of sediment from the underwater silt beds. Our preliminary ages suggest accumulation of sediment and bones around 100-140 thousand years ago, although that may change as we refine our techniques. The cores are also used to examine changes in pollen and sedimentary DNA through time. Already we've recovered evidence of Europeans in the cores, indicated by the presence of pine pollen as well as helminth eggs – that is, ova of human parasitic worms.

This scientific and caver collaboration is just beginning to bear fruits, and we'll be interrogating the data and samples we've collected for many years to come. We would like to thank all the people who have been involved over the years of this project, divers as well as non-divers, as without their volunteered time this research would have been almost impossible. Our results will hopefully be of interest not just to those who love the underground world and all it may hold, but will also reach the broader public, teaching them about the importance of caves and the natural archives they preserve.



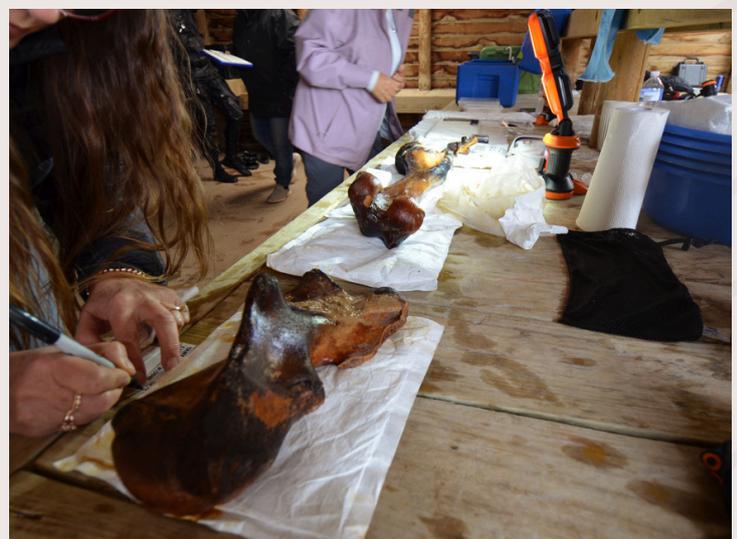
Palorchestes femur resting on the cave surface - Photo by Perry Brandes



Taking dating samples underwater - Photo by Steve Trewavas



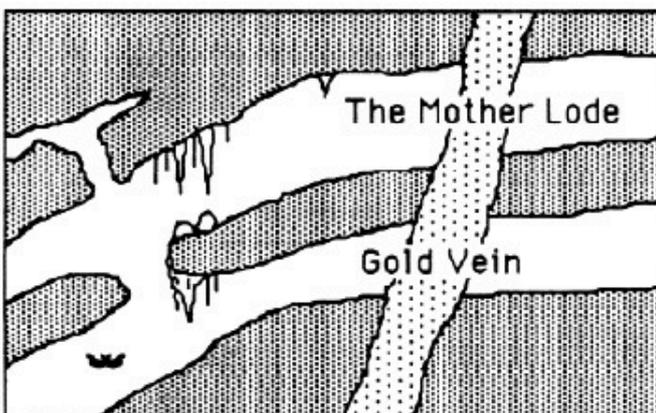
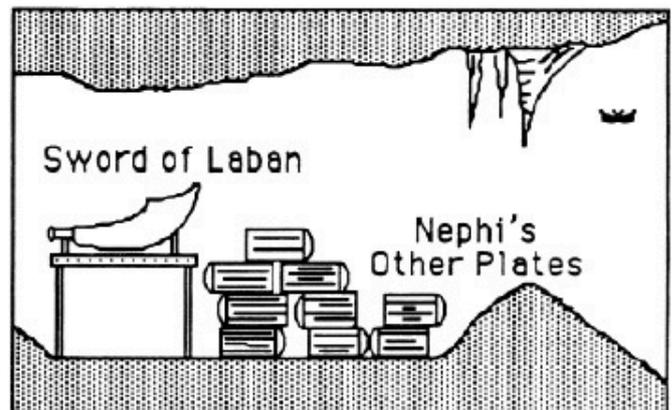
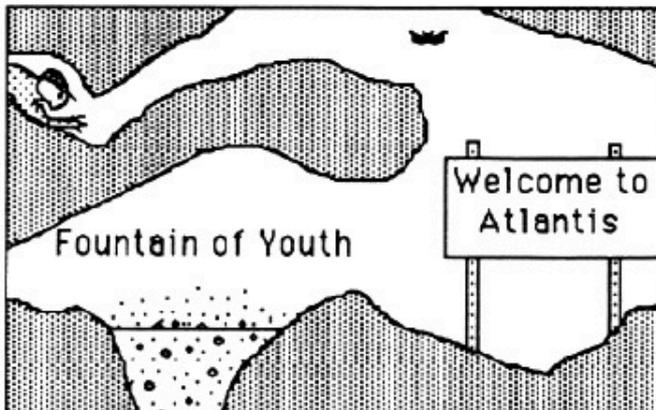
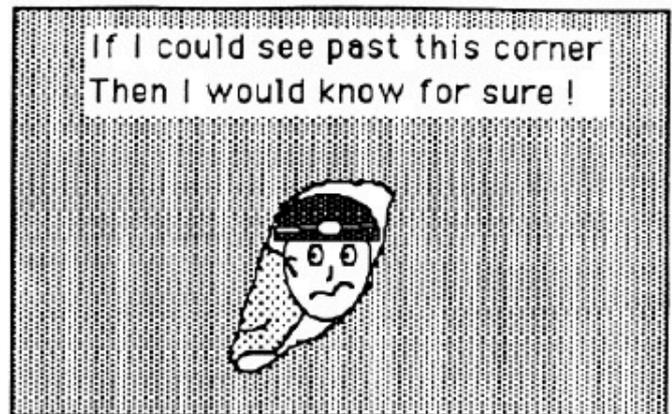
Planning fossil extraction in Tank Cave
- Photo by Joanne Wilkinson



Conservation of the fossils immediately after coming out of the water - Photo by Julien Louys

ONLY A CAVER

David Herron



Laos-Vietnam Expedition 2024

Alan Jackson



Dong Khe Vang stream passage, Laos -
Photo by Darren Mackenzie

The 2024 Vietnam expedition came and went in February-March this year and I was lucky enough to get along to it for another year. This year it was split into two halves with the first two weeks in neighbouring Laos and the second two weeks in Vietnam. The expedition organisers had previously been to Laos in 2020 for a recce and a few caves had been left with ongoing passage and it was time to get back to them.

The area we were targeting was essentially contiguous with the main area of karst that has been the primary target in Vietnam since the 1990s (what is mostly now contained within the Phong Nha Khe Bang National Park). The National Park stops at the border with Laos, but the limestone doesn't. While the location was effectively 'just over the border', as foreigners we were unable to use the direct route (the 'Twenty Road') to access it and instead had to spend a loooooong day in the van heading south to a border crossing where we could get the 'visa on arrival'. The roads in Laos are a bit ordinary and we had great fun nursing the vehicles through bog holes, heavily rutted sections and stream crossings where you could choose between a rickety homemade bridge or fording the wet way. We rocked into the town of Bualapha well after dark, covered in dust, shaken to pieces and sweltering in the evening heat. Welcome to Laos.

We found a restaurant in Bualapha with a most entertaining menu. Someone had obviously done a 'google translate' to produce an English version and the results were hilarious. Items such as 'boil the sea', 'sea urchins included', 'cow dung', 'spread the mango seed', 'I wet the chicken', 'I wet the pork frame' and 'touch the fish sauce' simply had to be ordered so we could determine what they really were. Cave passage names for the trip were sorted before we'd even found any cave!

We suffered some delays in Bualapha dealing with the local bureaucracy. Greedy old pricks in positions of power keen to fleece westerners to the maximum possible extent. Thankfully we had Terry Bolger with us (an American caver who has lived in Laos for years now and speaks the lingo) but it didn't completely avoid us being screwed over. We were planning on caving in what are quite sensitive border areas so we did need some level of official permission so the military wouldn't just turn us away, but it's always frustrating to be had a lend of. Essentially, they insisted that we be supervised (three of them with each of the two parties we intended forming) and we had to pay them, cover their food and travel costs, pay for porters to carry their food and stuff etc. We discussed if we'd roll over or just tell them to stick it and travel back to Vietnam and eventually opted for staying; we'd come this far, we knew the caves were good and it was only money. We split into two groups and left a day later than originally planned.

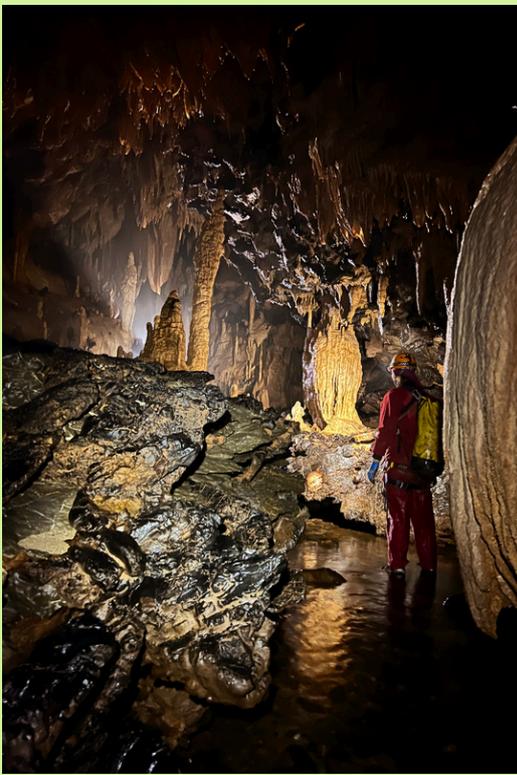
One group would be targeting areas closer to 'civilisation' and they were lumped with the higher ranking, older, greedier bureaucrats. The second group were heading into the mountains nearest the border, and we got the younger and more likable bureaucrats. I was in group two, and it was a full day on the 'road' (goat track?) to get to a small subsistence village called Nong Ma. Many sections of the road were still surfaced in the original limestone cobbles laid during the war (Ho Chi Minh Trail) - still holding up after 60+ years! The next day we bounced our way to an even smaller village (whatever the next level below subsistence is), Lang Uy, and walked off into the jungle. The first hill was a minor epic and one of our tagalongs didn't make the cut, returning to the creature comforts of Nong Ma.



The epic Xe Bang Fai in Laos - Photo by Lizzie Caisley



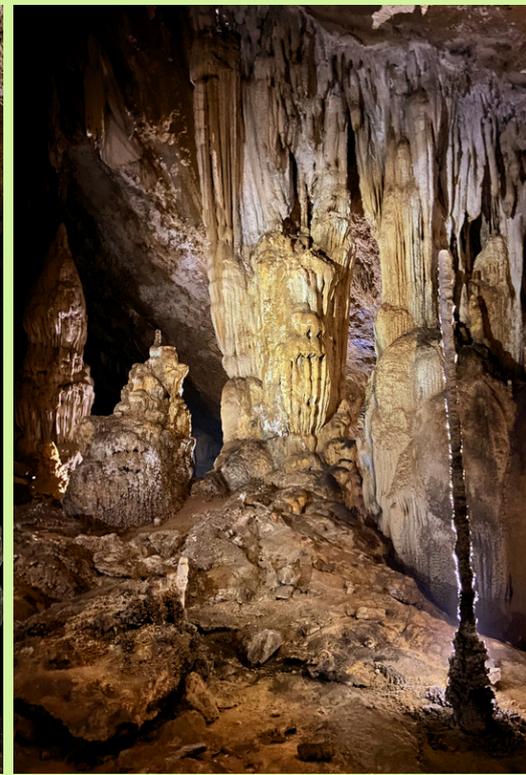
Darren rigging Spanners Away Pitch in Dong Khe Vang, Laos - Photo by Alan Jackson



Dong Khe Vang stream passage, Laos
- Photo by Darren Mackenzie



Hang Vuc Hung decoration
- Photo by Lizzie Caisley



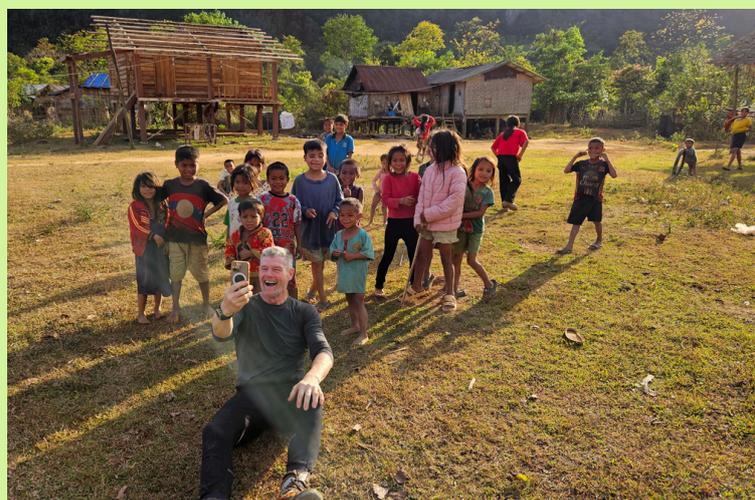
Hang Vuc Hung decoration
- Photo by Lizzie Caisley

We made our target campsite at the top of a ~100 m waterfall which tumbles into the massive entrance of Hang Khe Vang. 2020 exploration in HKV had been stopped by an 18 m pitch at 1448 m long and 168 m depth. The next morning we finally got to go caving! A massive double entrance doline bottoms out in a boulder choke but the average size of the boulders meant there are plenty of human-sized gaps and we wound our way through it until solid passage is encountered again. We soon hit the 18 m pitch and set about rigging it; Darren only threw one spanner down it in the process. At the bottom of the pitch the cave widened and flattened out; after ~500 m it sumped. A few side passages increased the metres surveyed and the cave now sits at 2090 m long and 174 m deep. Not as far as we'd hoped, but a good day's caving, nonetheless.

The next day we shifted camp to be closer to the other cave with going passage from 2020, Dong Khe Xoong (1050 m long and 110 m deep after 2020). We were taken to a new entrance near a stream sink which wasn't the entrance to DKX used in 2020. It proved to be a 40 m pitch which joined into the upstream most explored point of DKX. The caving down to the exploration front was fabulously sporty stream canyon. Again, it had been pitches that had stopped the 2020 crew and we were suitably armed to tackle them. A series of short pitches ensued, and we again found ourselves at base level for what proved to be a brief bit of pleasant base level stream passage terminating in a sump.



Easier than walking - Photo by Lizzie Caisley



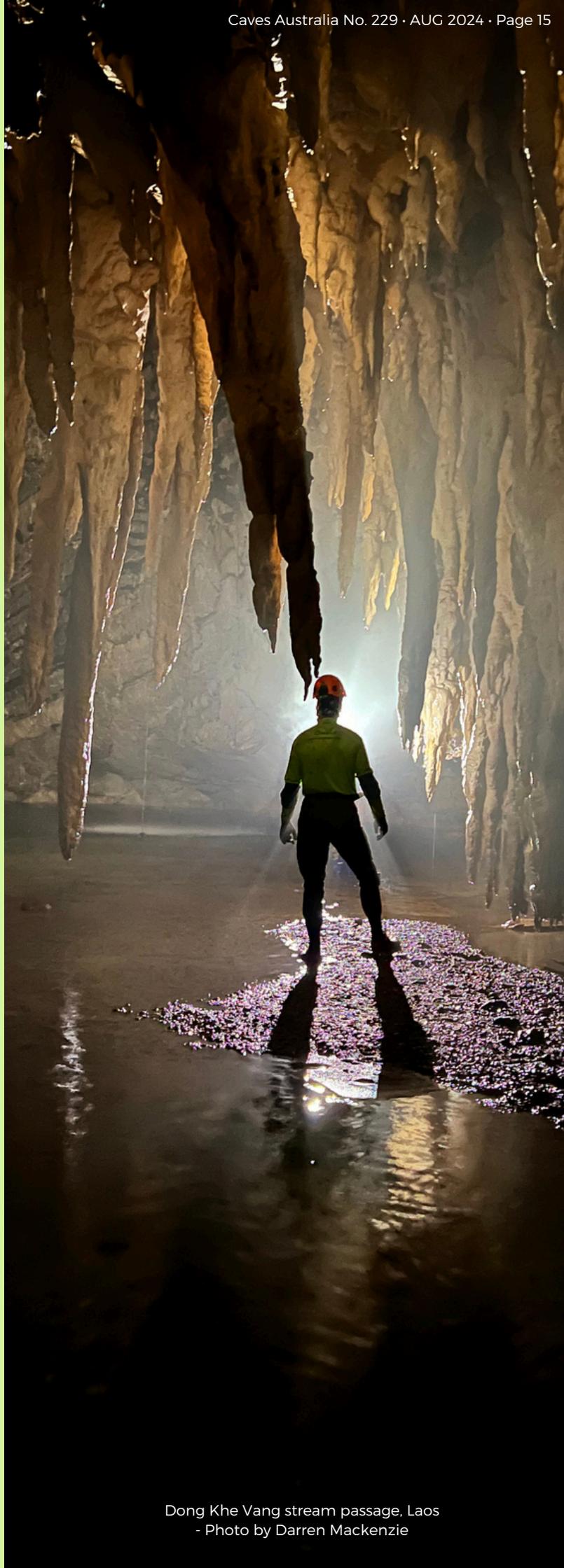
Darren terrorising the local kids in Nong Ma, Laos - Photo by Alan Jackson



Dong Khe Vang sump, Laos
- Photo by Darren Mackenzie

While surveying this last section I was wondering if we'd stumbled across some gravitational anomaly as despite the apparent observation of heading downstream all the clino readings were between positive 1 and positive 3. When questioned on the matter, Darren (on instruments) confessed to having been forgetting to acknowledge the negative sign in front of the DistoX2 inclination values. A riotous bollocking was dished out, obviously. We had another DistoX2 hiccup in the same passage, when my Disto spat the dummy and the back-up Disto we swapped to turned out to have been most previously used by an American caver and he'd changed the settings to 'metric feet'. It pretty much tells you everything you need to know about Americans that although some of them are smart enough to realise that surveying in feet and inches is utterly stupid, they are still too proud to fully adopt the perfectly functional metric system and instead devise a compromised system like decimal feet. HKX was all over but it had been a fun day's caving and it now stood at 1411 m long and 162 m deep.

There were no more known targets in this area, so we headed out the next day to Nong Ma. We contacted the other group to see how they were going, and it wasn't good news. Their extortionist tagalongs were wreaking havoc on their attempts to go caving and coming up with ever-inventive ways to demand more money. After a few minor extensions to 2020 caves and a couple of new things they abandoned their masters, spent a day or two touring in the epic Xe Bang Fai cave (huge river cave you explore on stand-up paddleboard or kayak) then bailed for Vietnam.



Dong Khe Vang stream passage, Laos
- Photo by Darren Mackenzie

We weren't sure if we had any more targets or not but every time it looked like we were also going to be heading for home some random villager would come out of the woodwork and say, 'oh yeah, I know a cave over there' and we'd be led to another cave. The first we were shown (Tham Pa Lang 1) was an underwhelming-looking thing with some standing water in the entrance. We shrugged our shoulders and waded in only to find that it just kept going and going in great style. 1.1 km later we hit an upstream sump and hung up the survey kit.

Over the next few days we explored another four caves with a combined length of 1.6 km. Most contained interesting relics from the war (fuel drums, pots and pans, bullets, bombs etc.). Never a dull moment. Finally, it was deemed we'd run out of entrances and we headed for Vietnam. We were able to come back a shorter way as we already had multi-entry visas for Vietnam and could slip in at one of the smaller crossings.



Nang Ma village in Laos - Photo by Alan Jackson



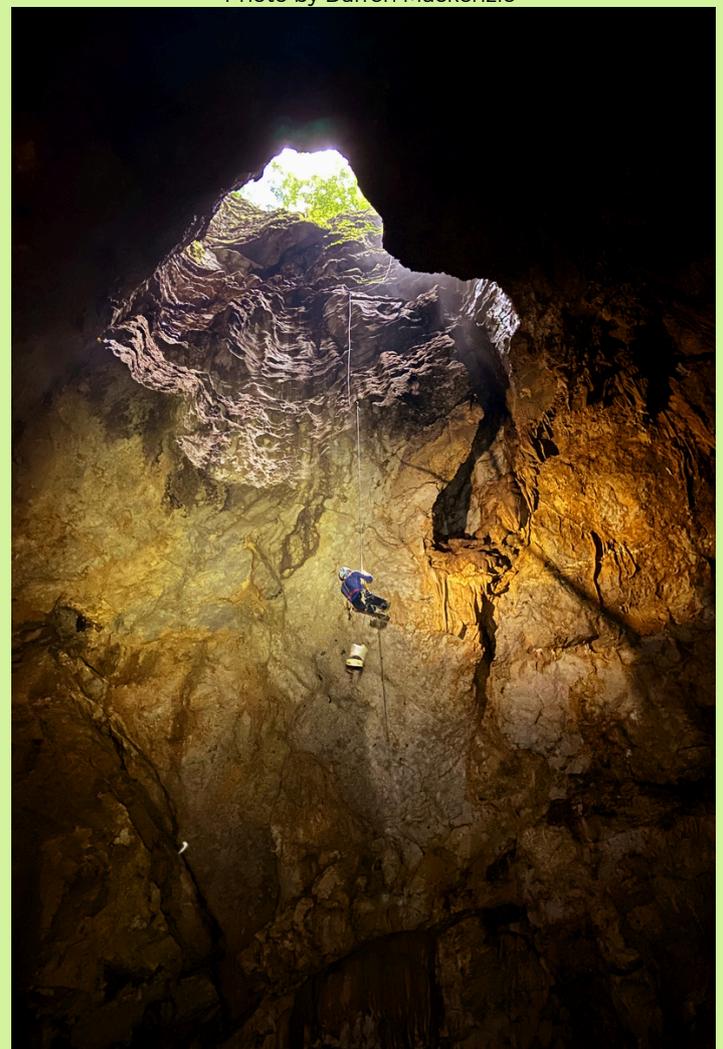
Returning to the civilisation of Lang Uy village in Laos - Photo by Alan Jackson



Harder obstacles above than below - Photo by Alan Jackson



Fabulous banded limestone in Hang Toi, Laos
- Photo by Darren Mackenzie



Hang Vuc Hung entrance pitch, Vietnam - Photo by Lizzie Caisley

Laos hadn't been as kind to us as it could have been, but between the two groups we'd racked up around 5 km of new cave and had some good times.

The Vietnam half of the expedition was technically as productive as the Laos portion (over 4 km of new cave surveyed) but it was spread over a higher number of shorter caves. We were taken to some spectacular entrances which disappointingly fizzled after short distances and depths. Nothing much longer than 500 m was explored but many interesting war-related cave modifications and paraphernalia were observed, and epic jungle slogs were endured. We joined in an upper entrance to 'Trevor's Cave' (where Trevor Wailes spent several days in a flood entrapment back in 1997 - read about it in *Caves Australia* 178). Martin Holroyd finally completed the dive in Hang Va which we'd carried dive bottles in for on the 2023 expedition and bagged over 500 m of new passage to another sump. We didn't get back to Hang Cha Ngheo from the 2023 exped (where Gab broke his arm) due to general logistics and last-minute personnel changes - it'll wait until 2025.



Things that used to go bang, Laos - Photo by Darren Mackenzie



Sketchy car ferry in Laos - Photo by Alan Jackson



Hitching a lift to the next cave in Vietnam
- Photo by Alan Jackson



Giant bamboo jenga - Photo by Alan Jackson



Surveying to the bitter end in Tham Pa
Lang 1, Laos - Photo by Darren Mackenzie



Some sites have very convenient platforms installed

Cave diving holiday in Mexico anyone?

Article and images by Janine McKinnon

For us dry cavers, going caving overseas can be somewhat difficult to arrange unless you have some obliging friends living somewhere useful, or are fortunate enough to get onto an expedition. Conferences with field trips are an option but come with all sorts of compromises.

Cave diving to a variety of interesting and visually spectacular locations is much easier to arrange. Sure, you must be suitably qualified as a diver, but that can be organised relatively easily too. You just have to be a bit motivated.

Because diving, and in this instance cave diving, requires obtaining an internationally recognised qualification, that means you have to pay, and that opens up the activity to commercial interests. Thus, anywhere there is even the slightest bit of cave to dive there will be someone offering training courses and guiding services as their way of making a living.

The Yucatan Peninsula in Mexico has more than just the odd bit of cave to dive. There are hundreds, maybe thousands, of kilometres of crystal clear, warm, shallow passage to swim around in (usually less than 30 m depth, and often only 10-15 m of depth). The state of Quintana Roo has the majority of diving sites extending 130 km from Cancun to Talum in a 10 km wide strip. To say commercial activity around diving these sites is busy would be a massive understatement.

I have been there three times over the last 10-15 years, and it gets busier each time. This gives the cave diving tourist lots of opportunities. There are scores of dive centres and diving instructors, keen to train divers with an advanced open water certificate in the skills needed to cave dive. There are several levels of cave diving qualification, and you can have an intensive time doing them all consecutively, if you are really keen, with lots of stamina and good basic diving skills.

If you opt to stop training at the second or third level, there are still plenty of good sites to dive. The qualifications you gain here are recognised elsewhere in the world.

Cavern tours, where you are never out of sight of daylight, are also extremely popular and all you need for them is an open water certificate, the most basic of diving qualification easily obtained in a few days. Of course, those courses are available too!

The Caves:

The caves of Yucatan were formed when the water levels were 30+m lower, so the caves are now decorated with the general run of speleothems we are used to in dry caves, except they are filled with that warm (25-29C), crystal clear, still water I mentioned earlier. It is an experience unlike any other - finning along looking at shawls, straws, columns and helictites.

All the caves have a layer of fresh water sitting on top of the salt water, and so there is a halocline at the interface. Some of the most spectacular haloclines in the world are here. It is a truly hallucinogenic feeling watching the shimmering illusion created by the different refractive indices of the two waters. Swimming along the interface is surreal, or watching your buddy swimming in the other layer. I found it mesmerising in the caves with particularly good examples.

There are so many cave entrances and complex routes that you could dive here every day for years and not have to repeat a dive.

If you want to see what the diving is like it is easy to find videos online. Go Sidemount have some really good ones on their website: <https://tinyurl.com/2x7fu3wx>

I have one of mine here (much less professional!). Most of the caves are much bigger than this one. <https://youtu.be/7y4aGOfbUo0>



The systems are complex, long, and have Mexican names you can't pronounce

Logistics:

Most of the sites are owned by local Mexicans and a small fee is required to enter. Anyone can go into most of the sites. Many allow swimming in the entrance cenotes. Some are set up with all sorts of facilities and are very popular, others are just a dirt track and a puddle of water at the end.

You could take yourself there and dive without a guide however I have found that it is much easier, time efficient, and generally more diving in interesting places gets done if you hire a knowledgeable and reputable guide. A brief warning here to get advice because there are quite a few shonkies operating, as well as the world-class instructors and guides that you can also employ.

Cancun is an international airport and has a steady flow of locals and tourists coming and going. Beware, the immigration queue can be an hour long (just like many US ones!). The area is as safe as anywhere really, as easy to get to as most places in the northern hemisphere for us, and quite modern as there are many, many US citizens living in gated estates there.

It is hot though. Hot and humid. So, if you are like this poor Taswegian immigrant who doesn't like the heat, go in the cool(er) season. Which is still very hot. And humid. The hot season doesn't bear thinking about.

Half of the fun of a holiday is researching so I won't give you many more details, except to say that my last two trips I hired Roger Williams as my guide and stayed in the accommodation he has at his home. Roger and I got on very well, our personalities worked together. He is very capable, laid-back, but organised and efficient. The meals his wife, Nelly, cooked were wonderful. They are Vegan, but don't let that put you off. I am not even vegetarian but loved the meals.

I am not spruiking for them, honestly! Just saying how I found using them for my holiday. Here is their website: <https://www.xoc-ha.com/>

There are other places in the world with highly decorated caves to dive in. This one is an easy and good starting point.



Crystal clear water, easy access, and a proficient guide

Slaven Cave, significant on a world scale

(created by subjacent karst?)

Article and images by Garry K. Smith

This incredible collapse sandstone cave is most likely the only example of its type in Australia (Kiernan 1988), while James & McIntyre (1988) suggest it ranked in the top ten largest of its type in the world.

Location

Slaven Cave is located in open eucalypt forests (dry sclerophyll) in a terrain of rolling hills, approximately 40 km east of Bathurst, NSW within the Falnash State Forest.

Cave description

Near the top of a gently sloping hill, the entrance to Slaven Cave is located at the base of a 8 metre rock face on the southern side of a collapsed doline measuring approximately 30 metres diameter (Fig 1). There are two entrances leading into the cave at the top of a steep talus slope on one side of a single large chamber measuring approximately 42 m L x 36 m W x 7 m H (Figs 2, 3, 8). At the base of the 35° talus slope is a relatively flat dusty earth floor at a depth of ~ 14 m below the entrance. Directly inside the entrance on the east side, a small lower chamber 3 metres wide by 0.7 metres high peters out after 15 metres.

Inside the main chamber a 1.6 metre deep archaeological dig can be seen on the eastern side of the chamber. There are several large boulders on the earth floor, some of which have graffiti painted on them.

Around the chamber there are several locations with speleothems consisting of small coralloids of grey-brown opal scattered across the walls and ceiling, the largest measuring up to 50 mm in length (Fig 4).

They occur when groundwater leaches silica from quartzite and sandstone, and when the water evaporates in the cave, silica is precipitated as opal (amorphous silica) or less commonly chalcedony (dense cryptocrystalline silica). On one part of the wall there is an unusual black secondary deposit of an unknown mineral (Fig 5).

For a brief period around midday, sunbeams penetrate deep into the cave and provide a dazzling light display (Fig 6).

During the time of our two visits, no bats were sighted, however there were a couple of high alcoves contained small piles of guano, which indicated that the cave is infrequently used by a few bats.

Fungi of several species were located on the moist talus slope leading into the main chamber. This would be expected as this area receives some light from the entrance at certain times of the day. Further in the dark zone, several species of spider were sighted as well as cave crickets and a few other invertebrates.

The cave has been used in the past by feral goats and there are numerous bones and skulls within the cave. In recent times, the goat population within the surrounding forest has been culled (Wylie 2021) and presently there don't appear to be any goats in the area. As well as goat skeletons there are a few kangaroo bones in the cave.

Several areas of the cave close to the surface, contain aerial roots which hang in the cave's high humidity atmosphere and absorb condensation droplets which form on them (Fig 7).



Fig 1. Collapse doline with entrance to Slaven Cave below exposed rock face.



Fig 2. Panorama view of inside Slaven Cave looking back toward entrance and talus slope.

Cave geology and formation.

Slaven Cave is a unique cave formed in sandstone of Upper Silurian - Lower Devonian age. However, Wilson (1988) points out that Slaven Cave is actually developed in volcanoclastics, which are sedimentary rocks produced by weathering of volcanic rocks being transported and redeposited.

The cave is located in gently rolling hills covered by forest in an area where a cave would not be expected, let alone one of such large dimensions.

Threat of the cave being flooded by the construction of a proposed dam led to several studies of the site. Spate (1988) and Keirnan (1988) suggest that this extraordinary sandstone cave is most likely created by collapse into a void created in underlying carbonate rock, although this has not been conclusively determined. James & McIntyre (1988) however, proposed that the cave's formation does not involve dissolution of underlying carbonate rock, but normal accepted processes for the formation of sandstone caves. Spate, Keirnan and James & McIntyre, all agree that the cave has been created by collapse into an underlying void.

Further investigation prior to a decision on the dam location, resulted in diamond core drilling within 300 meters of the cave, that revealed some calcareous bearing strata at depth. The geology revealed by the drilling led Wilson (1988), to conclude there was not enough calcareous rock to account for the scenario of collapse into a subjacent karst cavity.

However, as drilling was not undertaken directly through the cave, he suggested that an areally restricted limestone mass (greater than the adjacent 45 m drill hole depth) may occur at this location and have permitted formation of the subsidence features at Slaven Cave. There is no exposed carbonate rock at the surface nor within the cave and there is no visible associated karst development. However small outcrops of limestone occur at Brunts Creek and Mt. Lambie between 3 and 5 km away (Wylie 2018).

Cave classification

So, if we assume that the origin of the cave is the result of dissolution of underlying karst rock creating a void and the non-carbonate rock above collapses into it, what is the cave type classification?

A literature search revealed that occasionally caves do occur in non-carbonate rock after collapse into a void created by dissolution of underlying or adjacent soluble rock strata. eg. undermining of sandstone by cavern development in a subjacent karst, and subsequent collapse of the overlying sandstone. This type of collapse cave is sometimes referred to as a 'subjacent karst cave' and this term appears in several publications.

However, the term 'subjacent karst cave', can be confusing as the cave is not formed in the subjacent karst. The cave is formed in the overlying less soluble rock. So in the case of Slaven Cave, the better terminology to use is a "sandstone cave formed by subjacent karst processes". Similarly confusing terms used in many publications are, "subjacent karst doline" and "subjacent karst feature".

History and significance/heritage

The New South Wales Department of Mines Geological Map, dated 1875, shows the cave is originally called Bone Cave. The first mention of Slaven's Cave appears to be in 1877.

The reserve No. 44, covering 20 acres, to protect "Slaven's Caves" was created in 1877 and a notice appeared in the *New South Wales Government Gazette, Tuesday 27 March 1877 (No.105), page 1253 [904] Department of Lands, Sydney, 27th March, 1877*. Note that the spelling is Slaven's Caves.

Around this time John Slaven owned the 30 acre property adjoining the proclaimed Reserve No.44, so one would assume that the cave was given his name. John Slaven during 1878 became embroiled in a bitter fight with a neighbour Thomas Creswick who had shot Slaven's horse. Slaven was convicted with attempted murder of Creswick and sentenced to 3 months gaol (Whiting 2020).

Over the years since 1877, the area containing the cave and reserve status changed several times and the mention of Slaven's Cave was dropped from description of the reserve. e.g. In September 1888 the reserve became No.7122 and in 1914 changed to No.50415, with no mention of the cave. By 1959 the cave area had been absorbed into the Falnash State Forest (No. 966). Along the way the apostrophe and "s", appears to have been dropped from the cave name to become Slaven Cave.

Around 1988, Slaven Cave came under threat of being flooded by the construction of a reservoir to supply additional cooling water for Wallerawang Power Station (Wylie 2021). Hence it was possible that the area containing the cave could have been resumed by the Electricity Commission of NSW, if the construction of the Thompsons Creek Reservoir had gone ahead in its original proposed location. Several submissions relating to the cave were received by the Electricity Commission of NSW, which resulted in the reservoir location being moved to protect the cave from inundation (James & McIntyre 1988, Kiernan 1988, Spate 1988).

Spate's 1988 report states, "The cave is the only known example of a substantial cave formed by subjacent karst processes in Australia and therefore is of significance. As it is so unusual it deserves protection and further research as to its origins and the significance of its contents including sediments, faunal and cultural material."



Fig 3. Panorama view inside Slaven Cave, with entrance on left side of image.



Fig 4. Spider web on 30 mm long opal speleothem

Kiernan (1988) stated the major reason for the heritage of Slaven Cave is that it is the only example of a "subjacent karst cave" in Australia. James & McIntyre 1988 state that, "Slaven Cave is a component of the natural environment of the state of NSW as defined by *The Australian Heritage Commission Act 1975* and as such should be preserved."

The NSW Government, topographic map, Meadow Flat 8831-2S, 1:25000, dated 2022 shows that the land containing the cave is still within the Falnash State Forest.

Acknowledgement

Thankyou to ASF librarian, Cathi Humphrey-Hood for sourcing the unpublished reports to ELCOM and Katerina Fulton for proofreading.

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Fig 5. Black secondary deposit on wall



Fig 6. Beams of sunlight create a dazzling light show at the cave entrance.

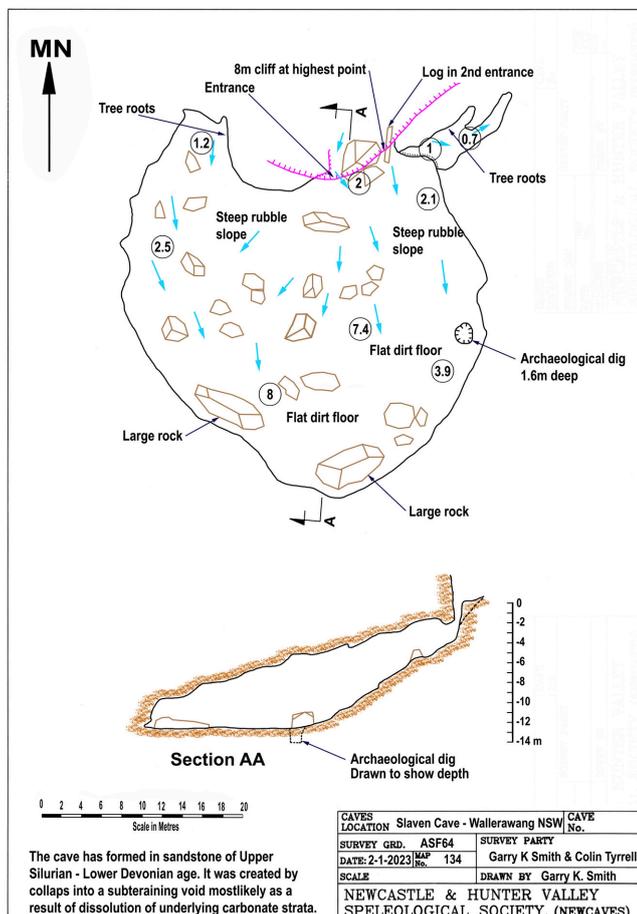


Fig 8. Map of Slaven Cave

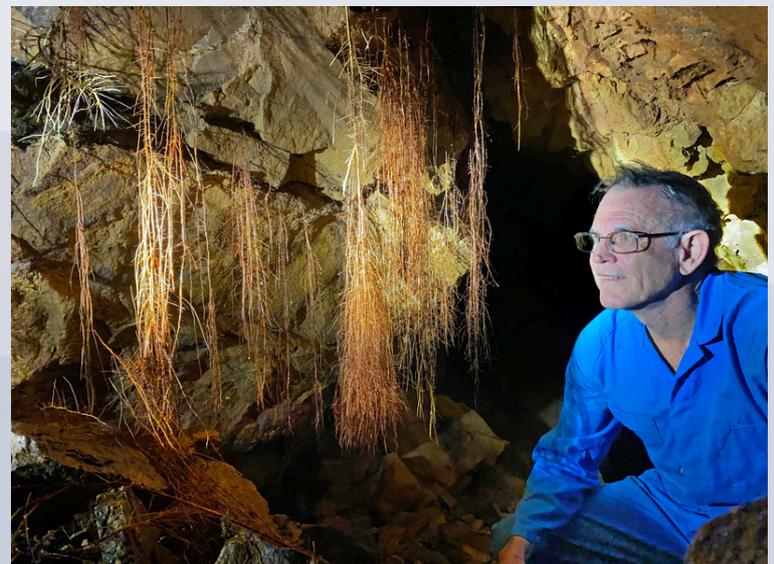


Fig 7. Aerial roots absorb condensation from the cave atmosphere

A photograph of a caver, Melanie, descending into a cave passage. She is wearing a white helmet, a red long-sleeved shirt, dark shorts, and a backpack. She is positioned on a rocky ledge, with ropes and cables visible. The cave walls are dark and textured, and the lighting is dramatic, highlighting the caver and the surrounding rock formations.

Caving beneath the range

Cape Range 2024

Daniel Lansom

When winter sets in most Perthites pack the car, leave the city and head north towards the sunshine, warmth and picturesque white beaches. This is exactly what we did, except our car was chock a block full of ropes, hiking packs and caving gear as we had no intention to visit the beach this time around!

For quite a while now, the Western Australian Speleological Group (WASG) has been in contact with the WA Department of Biodiversity, Conservation and Attractions (DBCA) to discuss the importance of protecting the cave C-215, which lies on the Ningaloo side of the Cape Range National Park. C-215 is a significant feature for the Cape, primarily for the biodiversity that lies in the cave, but also due to its relatively easy access for the public to enter without proper authorisation.

In the lead up to this trip, WASG funded and manufactured a gate for C-215 that would prove difficult to remove, but also not interrupt or change the cave environment itself (except for the two holes that were drilled into the rock). Ian Collette and Darren Brooks worked on sourcing a permit for the gate, whilst I worked on getting the permit for the rest of the trip.

On Sunday the 30th of June we hit the North West Coastal Highway towards Exmouth. After a couple of stop overs, we arrived in the town of Exmouth on Tuesday the 2nd of July. After visiting the DBCA office to make ourselves known and arrange a suitable day for the gate installation, we hit the beach for some snorkelling (unfortunately it was too late to go caving, so we did the tourist thing...)

Wednesday

We set off up Charles Knife Canyon for an easy day. Arriving at a picnic spot, we grabbed our kit and proceeded to walk to C-029 Bell Cave. For Mel, it was a great introduction to the hot and humid conditions found when caving along the Cape Range. We rigged the rope off the bar that lies over the opening and followed the short side passage, where we jumped on the rope and descended into the cave.

Bell Cave is a single pitch cave that descends about 17 m to the bottom. Once on the ground, there is a short passage that goes about 20-30 m before terminating. The cave was previously used for commercial tourism, but that has since stopped. We spent a short time exploring the cave before returning to the surface and commencing the drive across to C-018 Dry Swallet.

Once again, Dry Swallet is an easy vertical cave with a little multi-pitch goodness. We had a wander around the entrance, but decided that we didn't feel like heading in, so made our way back towards Bell Cave where we wandered across the bush to the nearby feature C-169 Slimy Hole.

Darren had advised us that there was an area of the cave that had not yet been surveyed, so we thought about going in to finish the survey. We rigged the rope and gardened a precarious rock at the entrance before dropping down. As soon as we were in the cave the hot, humid sliminess made itself very known. We were completely sodden, and as we were both recovering from a cold, we really didn't want to be in the hole anymore. So, instead of pushing onwards, we made the decision to head up and go back to camp to relax for the rest of the afternoon.



Daniel at pitch head of Spiral Cave -
Photo by Melanie Supanz



The Goat skulls - Photo by Daniel Lansom



Spider trap, Bell Cave - Photo
by Daniel Lansom

Thursday

On Thursday we met up with Darren and Karl Hellberg to install the gate at C-215. After a quick check of tools to make sure that we had everything (as the cave is about an hour's drive from town), we were on our way! Lucky for us, the cave is within a few hundred metres of the DBCA Parks Depot for the Cape Range National Park. Therefore, we parked up at the DBCA Depot, grabbed our gear and made the short walk to C-215.

For easier access, Darren brought along his telescopic ladder (instead of us using the precious Fig Tree roots to climb in). One by one we climbed down the ladder and made the short journey towards the water. We decided to turn around at a 2-3m climb that looked a little precarious as we didn't have a sling or short ladder to assist us. Plus, time was getting on and we had a gate to install!

On our return we met with Chantelle, a DBCA Ranger who brought us a couple of extra tools to help us with the gate. Darren, Karl and I set about drilling and chiselling rock to make room for the gate, and after a couple of very sweaty hours, it was complete! We did a dry run of installing the gate, which involved a very good kick and shake to test if it was strong enough to prevent backpackers from breaking in. Meanwhile, Mel was doing her best to block up the second entrance with a huge number of rocks and boulders. By the time she was done you couldn't even tell that it existed!

Once all satisfied, the lock was snapped shut and the gear was removed from the cave. Unbeknownst to us, whilst we were busy making an awful racket further underground, a group of wanna-be cavers tried to enter the cave! (Yes, this is exactly the reason why we were gating it). Mel managed to deter them until she was joined by the Ranger who further convinced them that not entering the cave was much cheaper than entering it!

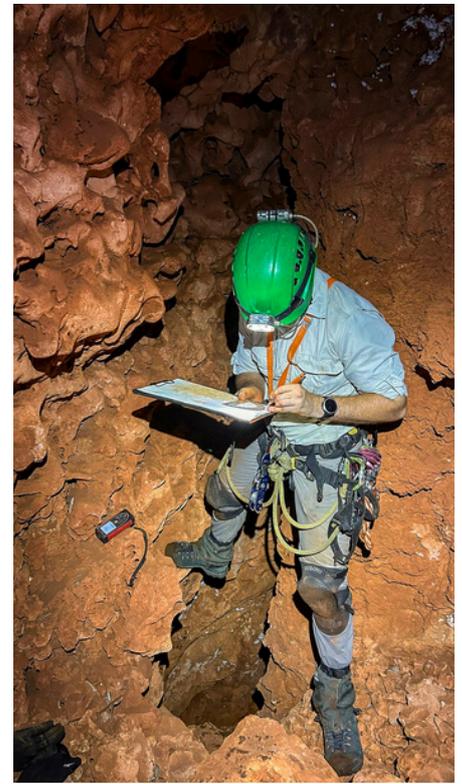
Our last task to complete at C-215, at the request of DBCA, was to install some 'Restricted Access' signage and a wildlife camera to see how much visitation the cave receives over the next month. After installing the above, a well-earned beer was had before turning in for an early night. The excitement to head up the range tomorrow was real!

Friday

We hit the road early to meet up with Karl and his son Dryden at the Cape Range Visitor Centre. From there we began the rough journey along the now closed 'Sandy Bay Track'.

After a about an hour or so of 4WDing we arrived at our destination, C-167 Spiral Cave. For Karl and Dryden, this would be their first multi-pitch cave. It is certainly one of the best sites to put all their training into practice!

Pitch by pitch we rigged, negotiated and descended the cave until we finally reached the bottom, which was about five pitches and 70-odd metres from the surface. Once everyone was on the ground, we followed the horizontal passage which was filled with blind cave spiders, sea urchin fossils and blind millipedes. The passage takes a turn up a loose rubble slope and then continues onward. I ended up waiting at the turn whilst Mel and Karl went to the end.



Daniel surveying mid passage in C-213 – Photo by Melanie Supanz



Post caving selfie with Daniel, Melanie, Karl & Dryden – Photo by Melanie Supanz



Bearded Dragon in C-213 – Photo by Daniel Lansom

Once satisfied, Mel and Karl returned to the group where we had a quick snack and drink before beginning the ascent back to the surface.

We stepped foot on the ground at roughly 2 pm where we indulged ourselves with some well-deserved lunch. Following this we popped over to C-163 Wanderers Delight to show Karl and Dryden the entrance before returning to camp.

Saturday

It was back to just the two of us today, so we decided to head off to Shothole Canyon a bit later than usual. The plan was to visit C-241 White Lady Cave, C-683 Y2Kave and C-864. We parked up, put our gear on and began our ascent up to the top of the canyon.

Darren had previously advised us that there's only a few access points to hike up the canyon and to the caves. We followed his directions and walked directly up the side of one of the canyons. The ascent was steep, loose and somewhat questionable at stages. At one point we were hiking right up against a ridge with an undercut drop-off on one side of us. All we could think about was coming back down later!

Once on top of the range, it was fairly easy hiking. We headed towards the pinpoint for C-864 and were soon able to sight the entrance, which headed into the side of one of the creek walls. We negotiated a steep tributary and arrived at the horizontal entrance.

C-864 is not a large cave, only 30 or so meters in length, but it is very rich in calcite formation. We left our bags at the entrance and headed into the northern chamber. The sloping entrance led to a short crawl which re-opened to roughly 5 m in height. The walls were lined with flowstone, making for some magical photos. After snapping some shots we returned to the entrance, gingerly trying to avoid disturbing the bats that called the cave home.

From C-864 it was roughly another 2.5 kms of hiking for us to get to C-683 Y2Kave. Unfortunately, one of the main tributaries that feed into Shothole Canyon stood between us and the cave, so we had to trek all the way around it before reaching the cave.

The cave was really easy for us to find as we just had to look for the really big fig tree that is growing out of the cave! Low and behold, underneath the fig tree lay a beautiful single pitch entrance into the cave. As it was a relatively easy entrance, I walked Mel through the steps of rigging the rope as she wanted to build on her roping skills.

There was an easy 10 m pitch which led into the first chamber. As I entered the cave first, I managed to snap some cracking photos of Mel descending in after me. The sun was seeping through just at the right time to almost silhouette Mel, whilst bringing out the most beautiful ochre red of the rocks behind her.



Surveying lower chamber of C-213 - Photo by Daniel Lansom



Darren Brooks installs trailcam at C-215 - Photo by Melanie Supanz



Darren Brooks at the entrance of C-215 - Photo by Daniel Lansom

The cave is a little over 50 m in length and again, chocked full of formation. We spent a fair while underground taking photos of each individual area. We clambered over some rocks from the main chamber to reach the lowest level of the cave; a large, flat, dry pindan mud floor that was split in half by a wall of stalactites and dry gour pools. On the other side of the stalactite wall was a chamber that increased to standing height. The chamber contained more formation before ascending to a terminal rockpile where the temperature and humidity changed drastically. Whilst most of the cave was a cool and pleasant temperature, the rockpile was disgustingly humid so we did not spend much time there.

On return to the surface, we de-rigged the rope and prepared ourselves for the long hike back down to the car. Mel was convinced that there must be a shorter, quicker way back down, and she scoped out a tributary that was near to the cave. Although I was set on hiking the same route back, her finding did look like it would lead us to the main Shothole Canyon and save us lots of time. In the end Mel won, and we descended the steep tributary back. It was safe to say that it wasn't as bad as it looked, and instead hiking four hours back, we descended the 100 m of elevation in just over 1.5 hours! Mel was pretty chuffed with herself...

We were hoping to have a look at C-241 White Lady Cave whilst we were up on the canyon, but sadly there weren't enough daylight hours, so we agreed that we will have to return another day!

Sunday

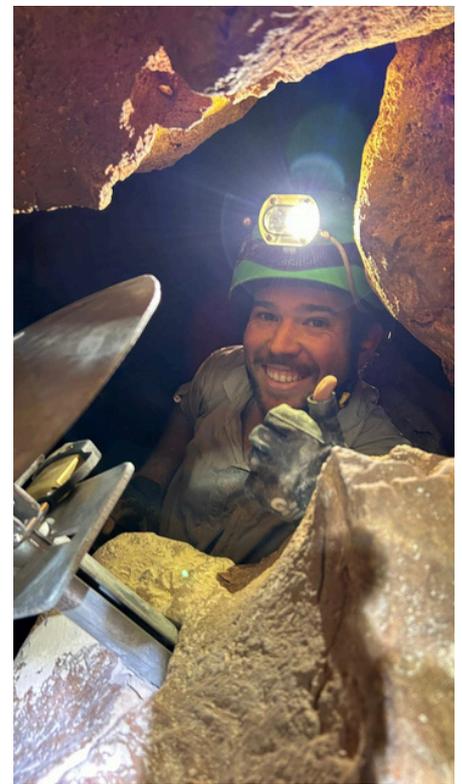
After the huge day yesterday, we did not go caving today. Instead, in the morning we installed some 'Cave Risk' signage on behalf of the DBCA at C-029 Bell Cave and C-018 Dry Swallet Cave. In the afternoon we went hiking in an attempt to find some new features, but we were unsuccessful.

Monday

Today was our last full day on the range, something that we were quite sad about. Where did the time go?! We decided to make the most of our last day and head back up the Sandy Bay track to have a look at C-213 Stick Nest Rat Cave. It had been on Darren's list for a while to go back out and survey it, as it only had a roughly sketched map from the late 1980's, so we offered to help. We grabbed our gear and headed back up the range.

The spinifex in the area was thick, and without knee-high gaiters on, I suffered from the scintillating grass as it pricked and poked me whilst hiking. The vegetation eventually gave way to a shallow, rock filled doline with a triangular shaped slot in the middle, and we knew that we had found the cave entrance.

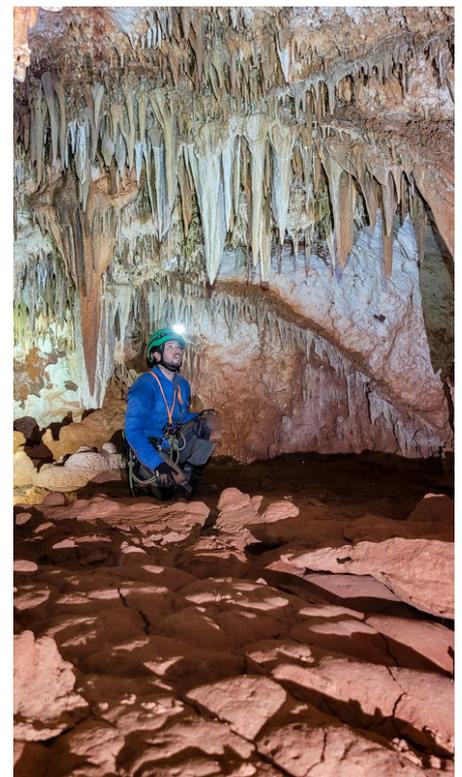
We spent a bit of time looking at the site to find the best way to enter the cave, but it was agreed that we would follow a rock filled rift that led toward the centre of the slot and drop in from there. The pitch was about 17 m in height with a small ledge about halfway down. I headed in first and Mel followed after. Whilst descending, she noticed that there was a slight rub point that I had missed whilst heading down, so she rigged up a nice little deviation to remove the issue.



Thumbs up, work is done! - Photo by Melanie Supanz



Melanie admires the gourpools in C-683 - Photo by Daniel Lansom



Daniel looks at formation in C-683 - Photo by Melanie Supanz

At the bottom of the pitch, we were greeted by a bearded dragon who had been calling the cave home. After snapping a few photos (he was quite photogenic!), we decided that it would be best to start the survey at the extent of the cave and work our way back towards the entrance, so this is exactly what we did!

The cave is essentially a single vertical shaft, with a rock filled bottom, that leads to a single lower chamber via a narrow slot. The lower chamber is roughly 1 m high and 10 m in length. It has a couple of stalactites and some flowstone along one of the walls, whilst the ground is a soft, dry pindan mud. We measured and sketched our way back to the entrance and up the pitch until we reached the surface.

Whilst I was mucking around with the disto and sketching, Mel managed to bag the bearded dragon and safely returned him to the surface. Here's hoping that it doesn't fall back in again!

We hiked back to the car and had some lunch before heading southward to C-096 Anomaly Cave. Finding the cave was quite easy, but it sadly looks like it has been visited quite a bit with some unauthorised entry as there was a defined track that led right to the cave entrance as well as some fresh Smith's chips on the floor of the cave.

The cave is essentially a single flat chamber with access gained through a collapse. It is a very active bat roost with quite a few bats sighted while we were inside the cave. Among the bats, the cave is also extensively decorated with a plethora of pristine calcite formation that went in many directions. We spent a good hour or so underground before finally returning to the surface for the last time.

On our return along the Sandy Bay track, we spied a large rock shelter across the valley that hadn't been identified in the latest Cape Range database, so up went the drone for a closer look. The rock shelter looks to be about 5 m wide and 1 m high, but its extents will have to be left until the next time that we are up on the range.



Melanie descends into Shothole Canyon - Photo by Daniel Lansom



Melanie looks out entrance of C-864 - Photo by Daniel Lansom



The entrance of C-864 - Photo by Daniel Lansom



Daniel at entrance of C-864 - Photo by Melanie Supanz



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