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The ACKMA Journal

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FRONT COVER: Climbing the entrance to Racer Cave, Mulu (Garry K. Smith)

IN THIS ISSUE

POSITION VACANT — May 2020

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EDITORIAL

Families, particularly the children, often count down to anticipated future events by picking off the number of "sleeps" before it takes place. Sometimes the anticipated event is one of joy (for going on a holiday or to a birthday party, for example) but also sometimes an event anticipated with far less enthusiasm (such as going to the dentist). It is a scheme that I have used in my own family for very many years. Indeed, my twin daughters who turn 40 next year use it not only with their own children but also continue to use it with me (when we count down to family visits because they live far away in other countries). For me, the ACKMA AGM in May next year, is an event which causes me to do a count down (but one using different measuring indicia).

As our President notes in his report, he and I are stepping down from our positions at the Annual General Meeting being held in conjunction with the Jenolan Conference. My count down (using Journal editions as the increment) is one tinged with a little regret (but not enough to make me continue).

Two years ago, I agreed to take on this role to support my friend Andy as President for the duration of his term. The time has come, both of us being gentlemen of mature years, for us to step down – hence the job advertisement bannering this page. It is time to pass the baton to another generation.

One Journal edition, after this one, to go!

This edition of the Journal is anchored by a piece from Steve Bourne about his recent return visit to Mulu. The pictures are spectacular as I have come to expect from him. The second half of his description of the visit will appear in the March 2020 Journal. There are two pieces about technical cave related matters, the first concerning a revision of the IUCN guidelines written by our treasurer, Dave Gillieson, and the second is one concerning education and oxygen isotope information written by Andy Baker.

I have included three pieces about graffiti, a constant curse for site managers. They follow on from an article with a similar theme in the September Journal. Wellington Caves contributes a short note on moving into their upgraded facilities. There are also a series of pieces on a range of other cave related topics – including a whimsical one from Dennis Rebbechi about events long past.

Contributions will now be accepted for the March Journal. At present, I only articles have booked in are the second part of Steve's article about Mulu and some material that I propose to write following my forthcoming visit during the Christmas break to Neolithic cave art sites in France. **Please don't be shy!**

JOURNAL BACK COPIES

If you would like to receive any (or many) of the back copies listed below, please send my Associate, Ms Peta Dixon, an email at peta.dixon@courts.nsw.gov.au; let her know what ones you want; and we will post you the requested copies if they are still available.

Requests will be met on what were known, in my youth, as "Boarding House Rules" - first in, best dressed!!

Issue	Month and Year	Copies
No. 83	Jun-11	4
No. 84	Sep-11	7
No. 85	Dec-11	Nil
No. 86	Mar-12	Nil
No. 87	Jun-12	6
No. 88	Sep-12	28
No. 89	Dec-12	9
No. 90	Mar-13	6
No. 91	Jun-13	Nil
No. 92	Sep-13	17
No. 93	Dec-13	1
No. 94	Mar-14	1
No. 95	Jun-14	4
No. 96	Sep-14	7
No. 97	Dec-14	51
No. 98	Mar-15	16
No. 99	Jun-15	7
No. 100	Sep-15	47
No. 101	Dec-15	19
No. 102	Mar-16	21
No. 103	Jun-16	11
No. 104	Sep-16	Nil
No. 105	Dec-16	41
No. 106	Mar-17	21
No. 108	Sep-17	1
No. 109	Dec-17	1
No. 110	Mar-18	1
No. 111	Jun-18	2
No. 112	Sep-18	7
No. 113	Dec-18	6
No. 114	Mar-19	2
No. 115	Jun-19	Nil

President's Report

Andy Spate

Recently, I attended the 73rd Savannah Guides Field School on the Atherton Tablelands in Far North Queensland. This four-day school was conducted under the slogan "Tableland Timelines, Tales and Treasures". It was an amazing experience. Savannah Guides is in many ways a similar organization to ACKMA – but also different in many ways. More on the meeting elsewhere in the Journal. While in FNQ, I took lightning visits to Chillagoe and Undara (see articles at pages 20 and 21).

As you all know the 23rd Cave and Karst Management Conference will be held in May next year. Scott Melton and his colleagues have been working hard to get the conference organized – we thank them for their efforts. I met with Scott at Jenolan recently – all seems to be falling into place.

Elsewhere in this Journal you will find a "call for presentation abstracts" for both papers and posters (with a strict deadline of 23 March) and a reminder about the need to disseminate information about the Ken Grimes Award available to provide support to attend the conference.

Matters recently discussed by your Committee include banking, a very minor legal issue with the Journal and communication problems within the Committee created by IT rules at various departmental agencies.

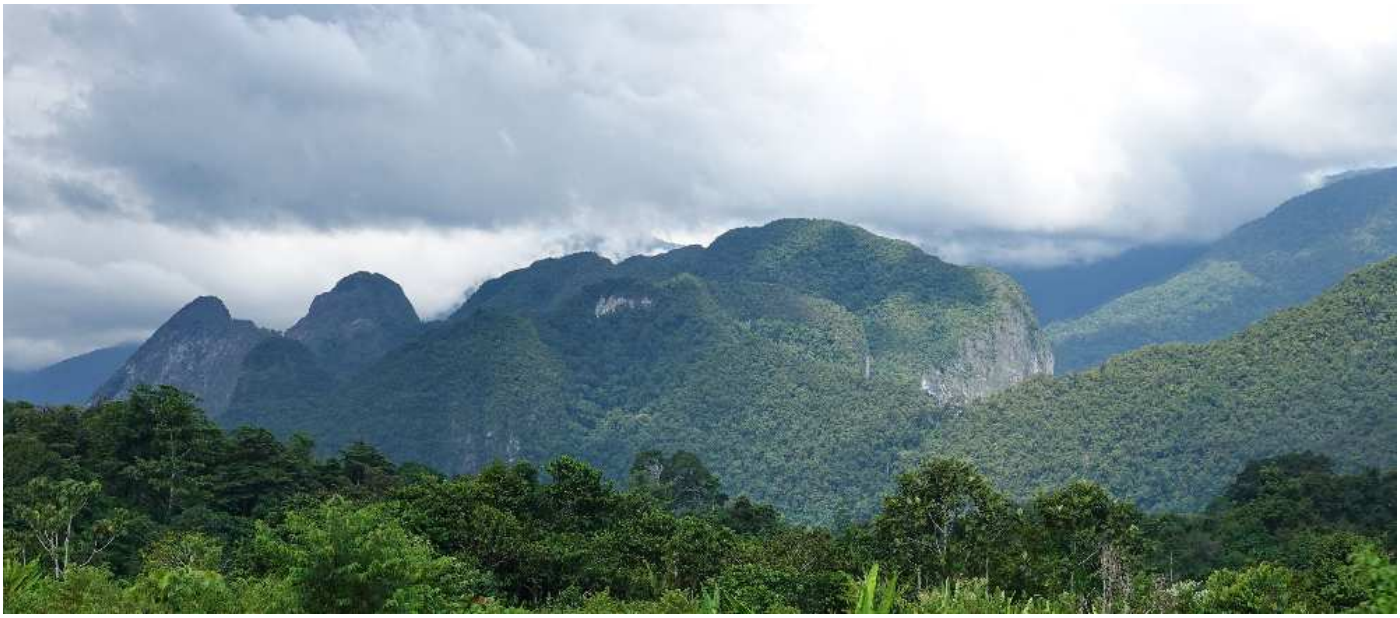
As intimated in the September Journal, both Tim Moore and I will not be re-standing at the AGM as Editor and President, respectively. So, start thinking about new committee people. Consider putting your hand up and help running your Association.

A visit to Mulu

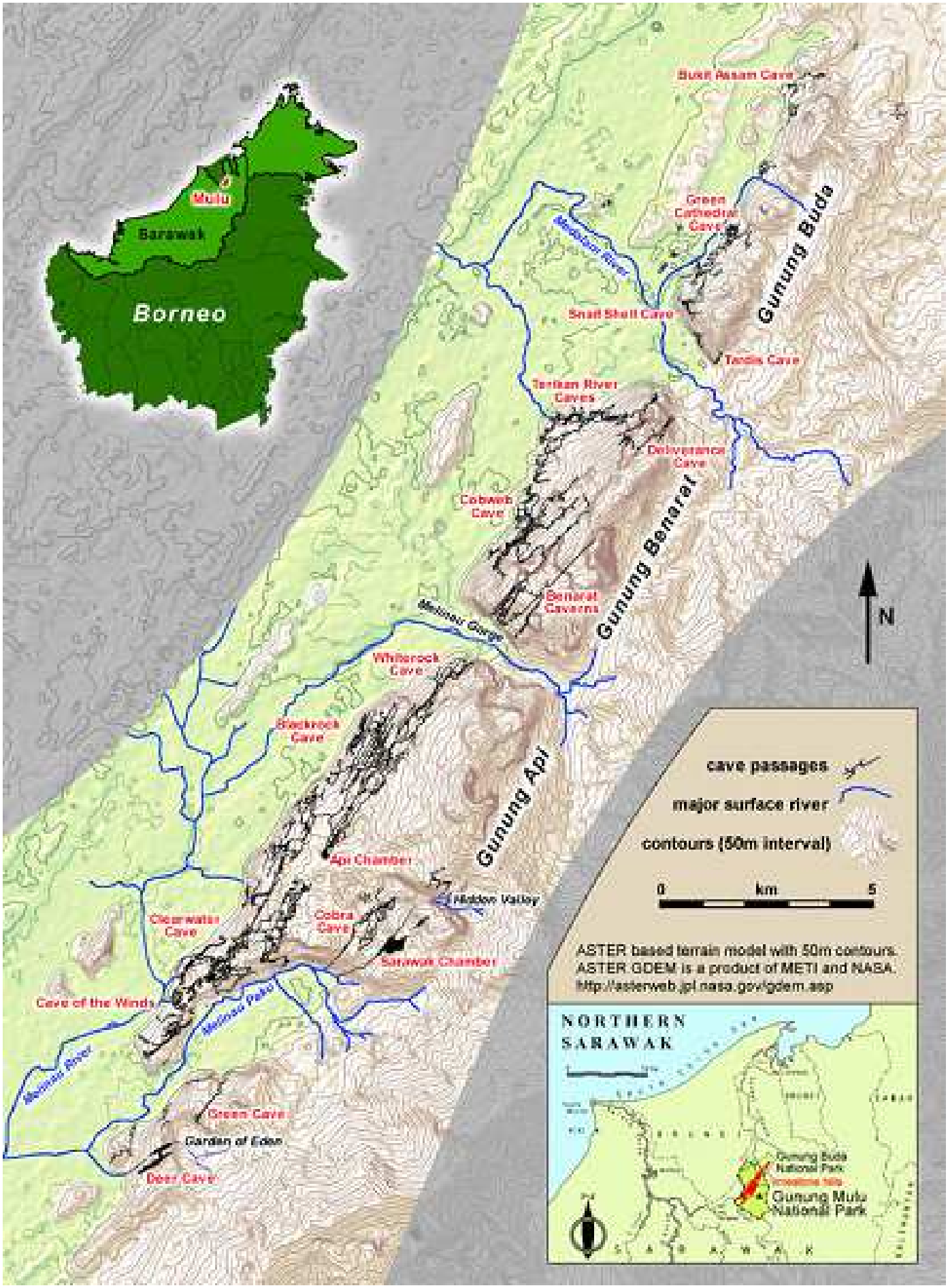
Steve Bourne

Mulu National Park is one of the great cave locations on the planet. Over 100 ACKMA members attended the Annual General Meeting "weekend", held over eight days in 2010, so the park is known to many readers. It is home to the world's largest cave chamber (by area), Sarawak Chamber, depending on how it is measured, and by whom, as well as Deer Cave, which had been regarded as the largest cave passage until the discovery of Son Doong in Vietnam. I had been there four times prior to this trip, including the ACKMA event while Brian Clark was manager. I had promised Hein and Andia Gerstner, ex-Cango Caves, South Africa, that I would visit them at Mulu when they took on the management role, but four years had passed since the promise was made and I still hadn't made it.

In 2018, I spent some time in Phong Nha Ke Bang National Park, Vietnam with Augusto Auler from Brazil and three of his friends. We took the Hang Son Doong 'expedition' and a number of caves as reported in editions of this Journal in 2018. The group was keen to visit Mulu, so I offered to coordinate the trip, based on my previous experience and knowing the manager and many of the staff. I sent the first e-mail on 19 July 2018 to start the planning and the folder finished with just over 200 e-mails. I only kept the e-mails that were important, from a planning perspective, so there were many more than this in the ensuing year. I provide this and a subsequent article as a chronological record as the itinerary worked quite well and will, I hope, be useful for others contemplating a trip to this World Heritage Site.



A view of the limestone of Mulu National Park (Garry K. Smith)



Map of the cave locations at Gunung Mulu National Park

It was not long after I drafted the first itinerary with Hein, senior guide Bian Rumei (who attended ACKMA 2009 in Western Australia) and Nina Binti Anuar (who is Hein's personal assistant) that Augusto contacted me to say the Brazilians would need to delay the trip until 2020. I had already invited Denis Marsh to join the trip while we were on the Nullarbor and he was committed to going. I really wanted to honour the promise to visit Hein and Andia and had been keeping abreast of news of a road construction that is getting closer to Mulu National Park. I hope it never happens, as it will place too much pressure on the natural resource and staff trying to manage it. So, I needed to find more people!

It's worth a few words describing how the team was put together. My friend, Julian Hume from the United Kingdom, had always been keen on Mulu but had a knee requiring an operation - not ideal for such a trip. We had to see how he came out of his March 2019 operation. I asked John Brush, as a keen traveller, two-time Mulu visitor and caver, and he was in. At the ASF Conference in Tasmania, in late December/early January, Denis suggested Garry Smith was interested. I knew Garry and invited him to join us for his second Mulu trip, he having also been at the 2010 ACKMA event.

I went on a bus trip at the conference and sat alongside Carey Barlow - I had never met her before. As you do at a caving conference, you talk about past exploits and future endeavours and the Mulu trip came up. Carey knows Tony White, one of the co-discoverers of Sarawak Chamber and Jerry Wooldridge, a UK photographer who took some early images of the chamber. She said she would love to do the trip. Do you invite a virtual stranger on a caving trip for two-and-a-half weeks? I thought I should at least find out a little information and was giving glowing references about Carey's caving exploits in Papua New Guinea in the 1980s' expeditions - no issues with Carey's capacity for Mulu! So this made five, plus Julian depending on how his knee operation went.

In February, Garry contacted me regarding a member from his caving club, Melissa Hadley, joining the trip. Accommodation was proving difficult in the park at Mulu, so I was hesitant to add too many people. After much to-and-fro, Hein negotiated a deal with the Marriott Resort adjacent to the park, advising them that I was the nephew of an Australian Prime Minister, Tony Abbott!

Julian came out of his knee operation well so we were seven: Denis Marsh, John Brush, Garry Smith, Carey Barlow, Melissa Hadley, Julian Hume and me. It was an experienced group; Melissa by far the youngest at 37, with an average age of 59. A group from diverse backgrounds - most only knew a couple of other trip members - so would this work? It is interesting when people have to send photos to each other so they can recognise on another at the airport! By end of April, everything was locked in for our August trip.

I 'sold' the trip to everyone as a full-on caving and cultural experience but it also had a serious management side. Hein sought our advice on several in-cave management issues and the three ACKMA members in our group had previously visited the area and had seen the area change over time and so were able to suggest some enhancements. In addition, we had also offered to give the staff presentations on a range of cave and karst topics that was likely to be new to them. Our aim was to broaden their knowledge of caves around the world. It was difficult to find a time that suited everyone, but we managed to squeeze in three presentations on our last full day in the area.

We flew from our various destinations and all arrived in Miri, Sarawak, on 8 August 2019, and met for a drink and introductions at the Marriott Hotel. I had arranged a taxi for 8.00 in the morning to travel to Niah Cave for the day, and warned the group that I am not patient and it would leave at 8.00. That set the tone and everyone was on time for the rest of the trip - mostly!

Buses run from Miri to Niah, but a taxi is a better option with a group. We paid MYR520 (Malaysian Ringgit – about MYR2.8 to A$1.00) for the day, with the driver waiting patiently until 4.00 pm when we finished our cave exploring. The entry fee is MYR20 to the park, plus MYR3 for a return trip in a boat across the river.

The caves are self-guided. I recall seeing security guards on a previous visit to Niah but did not see any this time. The caves are accessed via a raised boardwalk, a bit over three kilometres to Traders Cave (Gua Dagang), a shelter cave which was being excavated by Australian researcher, Darren Curnoe. Unfortunately, the researchers had completed their field season but we could still view the excavation. Traders Cave has a long history of human occupation and the research has revealed much about human settlements in South East Asia. See http://theconversation.com/we-found-evidence-of-early-humans-in-the-jungles-of-borneo-87336 for a summary of this work.

Traders Cave, Niah National Park (Garry K. Smith)

Niah Cave has a spectacular entrance. Apart from a building in the entrance, the first thing you notice is long pieces of timber hanging from the lofty ceilings. These are used by bird-nesters to reach their prizes. We were lucky on our visit as bird-nesters were active, with one offering a quick climbing demonstration.

We observed two of them, tens of metres off the floor, climbing what appeared to be sheer walls. There are the occasional fatalities here but, given the nature of the activity, it is amazing there are not more. A management agreement has been put in place to restrict bird-nesting to a set period, as bird numbers were dwindling from the pressure of collecting. The cave has bird-nesting poles throughout and a couple of daylight entrances. An unfortunate by-product of bird-nesting is large amounts of rubbish in the cave, including lots of plastic water bottles and spent batteries. Only small sections of the cave are totally dark and these have many bats.

Above—A bird nester gave us a climbing demonstration (Garry K. Smith)

Left—Bat in Niah Cave (Steve Bourne)

One passage exits Niah Cave and a further 500 metres or so on is Painted Cave. Previous visits, with time restrictions, meant I had never made it to Painted Cave (Kain Hitam), so I was pleased to finally see this cave. It has paintings on the walls (as the name suggests) and some basic signage. We had our lunch at the entrance of this cave before walking through to the other end. From here, it was about a five-kilometre walk back to the boat to cross the river and to our taxi, which we reached at the agreed time of 4.00 pm, to head back to Miri. Day one – 10 kilometres of walking, three caves - a good start!

Julian photographing a painting in Painted Cave (Steve Bourne)

Several years ago, Brian Clark (then manager at Mulu), Lisa King (then working for Sarawak Tourism) and I developed a proposal for Niah Caves. We could see a fantastic opportunity to develop the site for tourism well beyond its current offering. Our proposal received a positive hearing from the government but was ultimately discarded. Unfortunately, my observations now suggest the site has declined further from when this proposal was presented.

Mulu is a short flight of just over 30 minutes from Miri. We had the afternoon flight, which gave us time for some sightseeing and shopping for supplies for our field days in Mulu. We arrived mid-afternoon and were greeted by a beaming Hein Gerstner and Bian Rumei. They assisted us to the Marriott Resort and, after booking in, we took the resort "bus" to the Park HQ, the first of many such trips.

We returned to the park and it was great to meet up with the staff again. Kenneth Nilong was assigned to be our main guide, with Nick as his support guide. Kenneth attended the ISCA Congress at Jenolan Caves in 2014, so some ACKMA members may recall him. Our other assigned main guide was Lawai, who came to the Naracoorte ACKMA AGM and Guides' Workshop this year. Several of the other staff had also been to Australia to ACKMA events, which is a credit to Mulu managers, Brian Clark, Alison Pritchard and, now, Hein Gerstner. I also recognised several other staff I had met in Mulu previously.

We were eager to get a cave in for the day and walked the four-kilometre boardwalk to Deer Cave to watch the bats exiting the cave. The bat exodus had been irregular, but this night was excellent, with a large crowd in attendance.

Bat hawk catching a bat (Garry K. Smith)

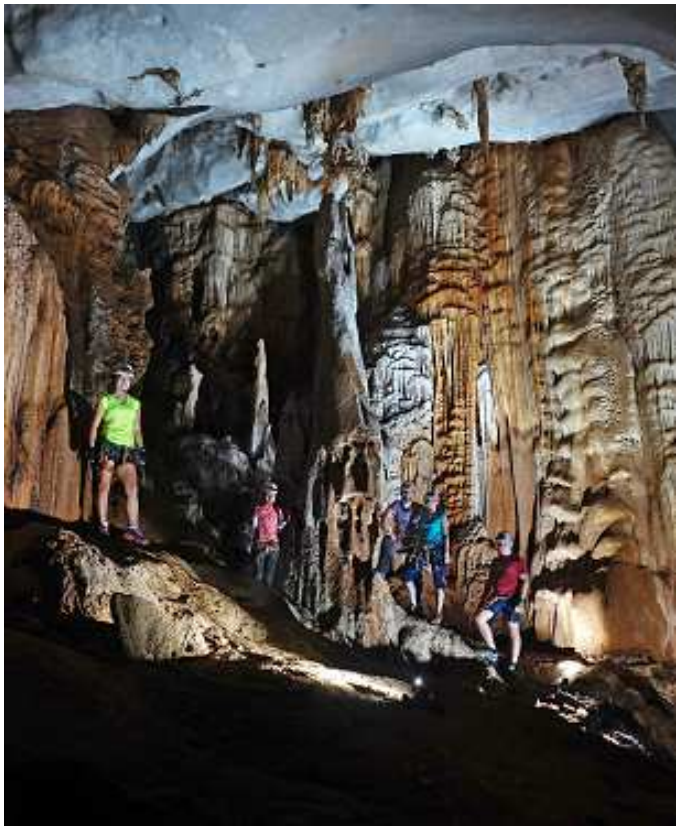
After watching the bat flight, we headed back to the Park Café for our dinner, having booked a table on the advice of Hein. When we entered the café, we could see a table with a large sign "Steve Group", which subsequently became our name for the duration of the trip. The Park Café is a great place to dine, good quality and good prices, but you do need to beat the nightly Deer Cave crowd so booking is recommended.

Our planned itinerary was to include the Garden of Eden trip on our first full day in Mulu. Tragically, just a couple of weeks before our visit, one of the park staff and a visitor lost their lives when floodwater in the rear of Deer Cave suddenly rose and washed them away. The tour was closed while investigations were completed so we instead brought forward one of our other tours - Racer Cave.

Racer Cave is about a 25-minute boat ride from Park HQ. Boats stop at Batu Bungan village, where locals offer locally produced craft. Some of us tested our skill with a blowpipe, the traditional means for hunting in the region. Carey wanted a carved wooden bat and Kenneth introduced us to a local craftsman who offered to carve one. One mistake was made in that the price was not negotiated before the carving was done, but more on that in the March 2020 edition of the Journal.

Racer Cave is named after the racer snakes that live in the cave and feed on bats and birds they catch. It is a good introduction to Mulu. High humidity, lots of biology in the cave - racer snakes, bats, birds and a taste of large chambers (although they would get MUCH bigger). Offered to visitors as a two-hour tour, it took "Steve Group" about five hours. Garry, John and I each had cameras so, with Garry's multiple flashes and great skill in setting up a scene, we took lots of photos (and I think bored our guides).

A tourist group came through at one point and were brilliantly dressed for cave photos, so were seconded for models. We exchanged e-mails in the cave and forwarded photos post trip. They were delighted. What a great way to meet new friends!



Above—The tourist group in Racer Cave (Garry K. Smith)

Below—Watching the bat exodus from Deer Cave (Steve Bourne)

I knew Garry was an excellent cave photographer so, after seeing his work the first day with his five flashes, decided not to carry my large camera through most caves and only took my small camera and tripod (as Garry didn't have one). This worked well, so I have a small part in the great images Garry provided for this article. I did carry the tripod many kilometres where it wasn't used, such as all the way into Sarawak Chamber.

I have a clear memory of Denis (when we finished Racer Cave on the first day at around 3.00 pm) asking, "Is that all we are doing today?" I assured him that taking it easy and pacing yourself in Mulu is a very good idea, especially when you have two full weeks of caving planned in the equatorial jungle environment. Our trip was planned to ease into it and build up to more strenuous activities as we became accustomed to the temperature and humidity.

The following day we stepped it up a little with the Clearwater Connection trip. This is available to regular visitors who have completed Racer Cave, as we had, and takes you from the Wind Cave (Gua Angin) entrance through approximately eight kilometres of cave - exiting the Clearwater Entrance. That only leaves around 250 kilometres more of this cave we didn't see!!!

It is a short longboat ride upstream from Park HQ, with the tour walking through the show cave section of Wind Cave before leaving the formed boardwalks to the undeveloped cave. Garry, John and I had each been through the cave before, with Garry having a photo idea he wanted to take. When we reached the river section of the cave, we spent quite some time setting up the photo and, after plenty of takes, eventually achieved the photo Garry was after.

Left—Melissa with a large shawl at the end of Racer Cave (Garry K. Smith)

Below—Garry had waited 9 years return to Clearwater Cave to take this image (Garry K. Smith)

Clearwater Cave, like many Mulu caves, has racer snakes. This skin was the largest we saw - Steve Bourne for scale (Garry K. Smith)

The Clearwater Cave tour involves a lot of walking through large, humid chambers, some nice decoration, some climbing and a couple of "squeezes" - although it is fair to say they wouldn't qualify as a "squeeze" at many Australian cave sites. The short climbs can be a little tricky but have been made very safe (with knotted ropes and a short ladder in one section). This work has been completed by Kenneth, who was impressed by what he learnt at Jenolan in 2014 and took these ideas back to Mulu for implementation. Once you reach the river section, it is around a 1.5-kilometre walk to the exit. In 2006, I floated along the river all the way out of the cave but the water was too low this time to do that.

Our plans for the next four days saw us leave the comfort of the resort for three nights at Camp 5 to climb the Pinnacles and visit Cobweb Cave. It is around a two-hour boat ride to Kuala Litut.

The river was very low and we were in and out of the boat many times, walking and pushing the boat laden with our gear.

From the drop-off point, it is just under a 10-kilometre hike through the jungle to Camp 5. Fortunately, it is mostly level ground. As the leader of "Steve Group", I volunteered to carry our food supplies to camp, so had my backpack of food and caving pack on my front. I didn't help my task by adding cans of Tiger beer to celebrate after summiting the Pinnacles.

When we arrived at Camp 5, it was clear Julian, fresh out of the United Kingdom, might have been feeling the heat and humidity when he said "if the Pinnacles' climb is anything like that …" I had to inform him it was nothing like we had just done.

Camp 5 was established by the British research expeditions and it consists of wooden huts, a kitchen area and an ablutions block. It is located on the bank of the Melinau River. The view is outstanding, with a limestone mountain with cave entrances directly across the river.

Steve and Melissa pushing the long boat (John Brush)

Our plan was to do the Pinnacles hike the first day and Cobweb Cave the second, but a guide at the camp, Undi, was keen to join our trip to Cobweb as he had never been there. This necessitated a change in order of activities. Undi was my guide on my first ever cave at Mulu - Racer Cave in 2006.

Cobweb Cave is approximately five kilometres from Camp 5 along the Headhunters Trail. It is not offered as a visitor product. It is located in Gunung Benerat, unlike the other caves we visited, which are in Gunung Api (**Gunung is Malay for "Mount" – ed**). I had arranged this through Hein prior to our trip, but knew nothing about the cave.

Kenneth told us his first trip to Cobweb Cave was as an eight-year-old, bird-nesting with his father, and that the cave name is derived from the multiple passages that look like a spider's web on the map. He hadn't been to the cave for over 10 years so it took some searching to locate the entrance, a few tens of metres off the level of the path.

Our other guides, Nimrod and Undi, were also on their first trip to the cave.

We spent a few hours in the cave but barely scratched the surface. At each junction, there were options left/ right/up/down and Kenneth needed to determine the correct path. It was not heavily decorated, but has some really interesting erosional features caused through bat and swift guano and plenty of water.

There were several racer snakes - including one Garry photographed with a somewhat nervous Kenneth.

Kenneth with a racer snake, Cobweb Cave (Garry K. Smith)

Denis, Garry and John climbed a wall with the guides and took some photos while the rest of us stayed at a lower level taking photos or just looking around (or - in Julian's case – sleeping).

Garry setting up flashes for a photo in Cobweb Cave (John Brush)

Cobweb Cave (Garry K. Smith)

I was gobsmacked to learn that one of the entrances we could see high on the cliff from Camp 5 was an exit to this cave - it would be a big trip through the cave to reach this. I would like to learn more about this cave. To explore more of it would likely involve a multiday trip.

On the return to Camp 5 at the river crossing, Melissa and I headed upstream to look at Melinau Gorge and the rest of "Steve Group" headed back to camp. This was a walk through mostly shallow water, slippery rocks and some great scenery. When we reached a delightful waterfall on the gorge walls, we turned back for camp. Our walk took us about 1.5 hours, which was pretty energetic after the five kilometres to and from Cobweb Cave and the cave trip itself.

Catering at Camp 5 is available for purchase if done prior to the trip. We self-catered with the load I had carried out there, with the Tiger beers carefully secreted in the river bed for retrieval following the climb. One of the staff working at Camp 5 was Robert Gani, who Brian had taken to the ACKMA Conference at Chillagoe and Undara in 2003.

The next morning, we awoke early, aiming for a 5.45 am departure to the Pinnacles. The climb is just 2.4 km long, but rises 1200 m with 18 fixed ladders in the last 400 m section. The guides assessed the weather conditions and decided it was safe to climb - if it is raining on the mountain, the climb is cancelled, as it becomes too dangerous. A Google search brings up a few fatalities that have occurred on this climb, so you do need to listen to guides carefully and not take it lightly. Climbers are required to reach checkpoints in a defined timeframe and, if not, guides will ask you to turn back. This is to avoid people trying to climb down in the dark, which would be a most unpleasant experience.

Steve on the Pinnacles climb (Garry K. Smith)

"Steve Group" was first to leave camp but we were caught by the first rest point by a small group of three. Melissa and Julian turned back early, both had not been feeling well and wisely decided against pushing it too hard. Denis reached the halfway point but was finding the pace a little too much and he, too, turned back. Garry was extra keen to get photos and I felt the group that had overtaken us was now slowing us down. With a group of loud, fit, young Irishmen singing on their way up the mountain coming fast behind us, I convinced guide, Nick, that Garry and I should overtake them, which we did. This gave us clear space to make a run at the viewing point, which we reached at 8.50 am - a reasonable effort, I thought. This gave Garry free access to the best points for photos with no one else at the small viewing point. John and Carey arrived about 20 minutes later and had held the Irish group at bay. This was a terrific effort from John, who had only recently recovered from pneumonia.

Carey on one of the 18 ladders nearing the summit (John Brush)

The Pinnacles are a collection of 50-metre high, razor-sharp towers of limestone, formed due to the very high rainfall and the vegetation that collects around the base that makes the rainwater acidic.

The Pinnacles is not the only such karst feature at Mulu, but is the most accessible. Kenneth told about others and said the walk "is just too tough". Given the effort to do this walk, I am not that interested in anything tougher.

Left—John and Carey at the Pinnacles (Garry K. Smith)

Below—Clouds and rain completely blocked the view of the Pinnacles a few minutes after the adjacent photo was taken (Garry K. Smith)

By 9.30 am, the last group was arriving and I felt sorry for them. The spectacular viewing conditions deteriorated suddenly, as clouds swept up through the valley, reducing visibility to just a few metres - and then it started raining.

We started the long climb down, which is probably more difficult than the climb up. The hand lines are essential, even more so with the light rain. These are all extremely well-placed, with knots at just the right spacings and the ladders at the perfect angles to make the climb easier. John and I had both completed the climb before and we both thought the second time around was every bit as tough as the first.

I ran out of energy about 200 metres from the end and had to sit for a rest, before catching up up with Carey, John and Garry who were waiting at the foot of the climb for the triumphant group-walk back to camp.

I consumed 4.5 litres of water on the hike up and back. It was then into the river to wash the smelly clothes and retrieve the beers I had hidden under rocks in the base of the river. Not overly cold, but very welcome!

The afternoon was dedicated to rest for all except Julian. He decided he would walk to Melinau Gorge. I assumed he was going with the Irish group who had shown interest the day before and he headed off about 2.00 pm. I suggested that they go no further than the waterfall that Melissa and I had been to the day before. I awoke about an hour later and discovered Julian had gone by himself, not a wise idea in the Mulu jungle. At 4.00 pm, I advised Kenneth that Julian had gone to the gorge alone and I walked the one kilometre to where the trail leads into the water, thinking if Melissa and I had taken 1.5 hours, surely he would be close to returning. Still no sign at 4.30 pm, so the guides prepared to start a search and headed off at 5.00 pm, with the sun starting to disappear behind the mountains. At around 5.20 pm, a rather dishevelled Julian appeared - he had just emerged from the river when the guides got there. He had somehow missed the waterfall that Melissa and I had seen and had kept going, obviously for some distance. It was a good reminder for us all that solo walking in Mulu is not a good idea.

..... Part 2 will appear in the March 2020 Journal

A Second Edition of the IUCN Guidelines for Cave and Karst Protection

Professor David Gillieson
University of Melbourne

Introduction

Back in 1995, a group of ACKMA members gathered in the shadow of Mount Roland, Tasmania, with the aim of writing some generic guidelines on cave and karst protection. At the time, it was felt that many land use planners and managers (and politicians, as a subset of the general population) thought and acted in 'two dimensions' only and did not recognise or even ignored cross-boundary influences from outside the strict boundaries provided by the cadastre. We saw a need for a 'three-dimensional' approach to the complexity of karst management and that the smaller karst areas were particularly vulnerable to external influences, especially from adjoining land uses.

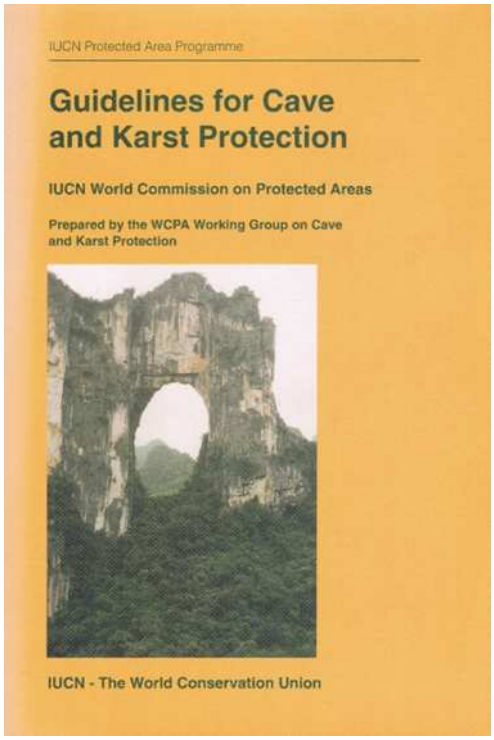
We produced the guidelines under the auspices of the World Commission on Protected Areas (WCPA), one of six Commissions of the World Conservation Union (IUCN). The WCPA is the leading global network of protected area experts with over 1,000 members in 160 countries, working in a voluntary capacity. WCPA promotes the establishment and effective management of a worldwide, representative network of terrestrial and marine protected areas. This is essential to ensure that protected areas can effectively meet the challenges of the 21st century.

The guidelines were written by John Watson, Elery Hamilton-Smith, David Gillieson and Kevin Kiernan. Others who made significant contributions were Andy Spate, Kevan Wilde, Nick White and Sue White. The final publication was edited, designed and produced by Dave Gillieson and Ric Longmore from Environment Australia. The full text can be downloaded at https://www.iucn.org/content/guidelines-cave-and-karst-protection-0.

The guidelines have been widely used and have been translated into several languages. They have informed the development of management plans for karst areas worldwide. It is now time to produce a new edition to take account of significant developments in karst science and protected area management.

A Second Edition

The new edition will be produced under the auspices of the Cave and Karst Working Group (CKWG) of the Geoheritage Specialist Group within WCPA. As the name implies, WCPA is focused on Protected Areas and, as a part of WCPA, the CKWG must have a primary interest in the management of caves and karst in protected areas. This is particularly true of World Heritage Sites (WHS) and Global Geoparks but also in other national protected areas (for example Ramsar Sites and MAB Reserves).



Cover of the First Edition

The CKWG currently has two goals:

- revision of the IUCN Guidelines for Cave and Karst Protection
- producing a report on caves and karst in international protected areas other than World Heritage Sites, specifically Global Geoparks, MAB Biosphere Reserves and Ramsar sites.

As one of the authors of the original guidelines, I am aware that, in addition to geoheritage, there needs to be an effective coverage of the biological issues involved in cave and karst conservation. Biological issues were not covered in the first edition and it is important for us to collaborate with the IUCN Cave Invertebrate Specialist Group, as well with as the Biology Commission of the International Union of Speleology. The original version had an Antipodean bias which we tried to reduce by gaining comments on the draft from a wide global community of karst specialists (about 300 in total). This inclusive process of review worked well for the first edition and we plan to have a similar approach to the second edition.

As John Watson has pointed out, the original guidelines did not restrict the coverage to protected areas alone. It is critically important to take a whole of landscape approach to cave and karst conservation, management and protection. This will make the new guidelines more useful for planning at local, regional or national scales.

We need to have a clear idea of the target audience and thus write the guidelines to improve readability and reduce use of technical terms and facilitate translation. Since the primary mode of dissemination is likely to be on line, we can use colour effectively with a few good diagrams to illustrate key concepts.

The use of boxed case studies and high-quality photographs will also improve readability. I look forward to hearing from people who are interested in being involved in writing the new edition. I have agreed to coordinate this work and contribute to the writing, but we need to be global in coverage and local in effective action. I have taken the liberty of putting down some of my ideas below so you have something to consider and respond to.

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Draft Headings for Discussion:

- Introduction: The need for karst protection
- Some values of karst and caves
- The special nature of karst environments and cave systems
- Environmental impacts on caves and karst
- A landscape approach to karst protection
- Some basic management principles
- Developing effective monitoring

Appendices

1. The IUCN-WCPA-GSG-Cave & Karst Working Group (brief summary and Terms of Reference)
2. Guidelines in English (below are the present guidelines which will be substantially revised)

- Effective planning for karst regions demands a full appreciation of all their economic, scientific and human values, within the local cultural and political context.
- The integrity of any karst system depends upon an interactive relationship between land, water and air. Any interference with this relationship is likely to have undesirable impacts and should be subjected to thorough environmental assessment.
- Land managers should identify the total catchment area of any karst lands and be sensitive to the potential impact of any activities within the catchment, even if not located on the karst itself.
- Destructive actions in karst, such as quarrying or dam construction, should be located so as to minimise conflict with other resource or intrinsic values.
- Pollution of groundwater poses special problems in karst and should always be minimised and monitored. This monitoring should be event-based rather than at merely regular intervals, as it is during storms and floods that most pollutants are transported through the karst system.
- All other human uses of karst areas should be planned to minimise undesirable impacts and monitored in order to provide information for future decision. making.
- While recognising the non-renewable nature of many karst features, particularly within caves, good management demands that damaged features be restored as far as is practicable.
- The development of caves for tourism purposes demands careful planning, including consideration of sustainability. Where appropriate, restoration of damaged caves should be undertaken, rather than opening new caves for tourism
- Governments should ensure that a representative selection of karst sites is declared as protected under legislation which provides secure tenure and active management.
- Priority in protection should be given to areas or sites having high natural, social or cultural value; possessing a wide range of values within the one site; which have suffered minimal environmental degradation; and/or of a type not already represented in the protected areas system of their country.
- Where possible, a protected area should include the total catchment area of the karst.
- Where such coverage is not possible, environmental controls or total catchment management agreements under planning, water management or other legislation should be used to safeguard the quantity and quality of water inputs to the karst system.

- Public authorities should identify karst areas not included within protected areas and give consideration to safeguarding the values of these areas by such means as planning controls, programs of public education, heritage agreements or covenants.
- Management agencies should seek to develop their expertise and capacity for karst management.
- Managers of karst areas and specific cave sites should recognise that these landscapes are complex three. dimensional integrated natural systems comprised of rock, water, soil, vegetation and atmosphere elements.
- Management in karst and caves should aim to maintain natural flows and cycles of air and water through the landscape in balance with prevailing climatic and biotic regimes.
- Managers should recognise that in karst, surface actions may be sooner or later translated into impacts directly underground or further downstream.
- Pre. eminent amongst karst processes is the cascade of carbon dioxide from low levels in the external atmosphere through greatly enhanced levels in the soil atmosphere to reduced levels in cave passages. Elevated soil carbon dioxide levels depend on plant root respiration, microbial activity and a healthy soil invertebrate fauna. This cascade must be maintained for the effective operation of karst solution processes.
- The mechanism by which this is achieved is the interchange of air and water between surface and underground environments. Hence the management of quality and quantity of both air and water is the keystone of effective management at regional, local and site. specific scales. Development on the surface must take into account the infiltration pathways of water.
- Catchment boundaries commonly extend beyond the limits of the rock units in which the karst has formed. The whole karst drainage network should be defined using planned water tracing experiments and cave mapping. It should be recognised that the boundary of these extended catchments can fluctuate dramatically according to weather conditions, and that relict cave passages can be reactivated following heavy rain.
- More than in any other landscape, a total catchment management regime must be adopted in karst areas. Activities undertaken at specific sites may have wider ramifications in the catchment due to the ease of transfer of materials in karst.
- Soil management must aim to minimise erosive loss and alteration of soil properties such as aeration, aggregate stability, organic matter content and a healthy soil biota.
- A stable natural vegetation cover should be maintained as this is pivotal to the prevention of erosion and maintenance of critical soil properties.
- Establishment and maintenance of karst protected areas can contribute to the protection of both the quality and quantity of groundwater resources for human use. Catchment protection is necessary both on the karst and on contributing non-karst areas. Activities within caves may have detrimental effects on regional groundwater quality.
- Management should aim to maintain the natural transfer rates and quality of fluids, including gases, through the integrated network of cracks, fissures and caves in the karst. The nature of materials introduced must be carefully considered to avoid adverse impacts on air and water quality.

Lower Flint Ridge Cave, Mammoth Cave World Heritage Area, Kentucky, USA

- The extraction of rocks, soil, vegetation and water will clearly interrupt the processes that produce and maintain karst and therefore such uses must be carefully planned and executed to minimise environmental impact. Even the apparently minor activity of removing limestone pavement or other karren for ornamental decoration of gardens or buildings has a drastic impact and should be subject to the same controls as any major extractive industry.

- Imposed fire regimes on karst should, as far as is practicable, mimic those occurring naturally.

- While it is desirable that people should be able to visit and appreciate karst features such as caves, the significance and vulnerability of many such features means that great care must be taken to minimise damage, particularly when cumulative over time. Management planning should recognise this fact and management controls should seek to match the visitor population to the nature of the resource.

- International, regional and national organisations concerned with aspects of karst protection and management should recognise the importance of international co-operation and do what they can to disseminate and share expertise.

- The documentation of cave and karst protection/management policies should be encouraged and such policies made widely available to other management authorities.

- Data bases should be prepared listing cave and karst areas included within protected areas, but also identifying major unprotected areas which deserve recognition. Karst values of existing and potential World Heritage sites should be similarly recorded.

Further Reading:

BirdLife/FFI/IUCN/WWF (2014) *Extraction and Biodiversity in Limestone Areas*, Joint Briefing Paper

British Columbia, Ministry of Forests (2003)-Karst Management Handbook for British Columbia, https://www.for.gov.bc.ca/hfp/publications/00189/Karst-Mgmt-Handbook-web.pdf

Department of Primary Industries, Parks, Water and Environment (Tasmania) (2018) *Protecting and Managing Karst*, http://dpipwe.tas.gov.au/conservation/geoconservation/karst/protecting-karst

International Show Caves Association (I.S.C.A.), International Union for the Conservation of Nature (I.U.C.N.) and the International Union of Speleology (U.I.S.) (2014) Recommended International Guidelines for the Development and Management of Show Caves, http://www.uis-speleo.org/documents/Recommended_International_Guidelines_published_version.pdf

Kresic, N, (2013) *Water in Karst: Management, Vulnerability, and Restoration*, McGraw-Hill, New York, 736 pp

Prosser, C, Murphy, M and Larwood, J (2006) *Geological Conservation: A Guide to Good Practice*, English Nature, Peterborough, available at: http://publications.naturalengland.org.uk/publication/83048

Veni, G and seven others, 2001, *Living with karst: A fragile foundation,* American Geological Institute Environmental Awareness Series, 4, https://www.americangeosciences.org/sites/default/files/karst.pdf

Vermeulen, J & Whitten, T, 1999, *Biodiversity and cultural property in the management of limestone resources - lessons from East Asia,* The World Bank, Washington DC, 120 pp

Watson, J, Hamilton-Smith, E, Gillieson, D and Kiernan, K, (1997) Guidelines for Cave and Karst Protection, IUCN, Gland, https://www.iucn.org/content/guidelines-cave-and-karst-protection-0

Left—laciated karst near Torre de Cerredo, in the Picos de Europa World Heritage Area, Spain

Right—Polygonal karst at Waitomo, New Zealand

Oxygen isotopes, stalagmites and stalactites and past climate variability

Andy Baker, UNSW, Sydney

From late 2018 in New South Wales, Year 12 students studying "Earth and Environmental Science" are learning about how isotope ratios in stalagmites and stalactites can be used to provide evidence of climate variation.

When you read on, ask yourself these questions - Could the "oxygen isotopes" lesson be useful to present to cave guides? And are students and teachers already coming to caves and asking about isotopes and speleothems? What would you say?

Specifically, in Module 7 (Climate Science) for year 12, teachers are now covering "Evidence for Climate Variation" with an "Inquiry question" of "What scientific evidence is there of climate variations in the past?" Students are asked to:

> Identify and explain more recent evidence of climate variation, including but not limited to:
>
> - ice cores containing gas bubbles and oxygen isotopes
> - dendrochronology
> - Aboriginal art sites showing now-extinct species and environments
> - human instrumental records
> - isotope ratios shown in stalagmites, stalactites and corals

What the examiners are specifically thinking of, in the last point, is oxygen isotopes in stalagmites. Because of this, I now have a two-hour lesson prepared on "oxygen isotopes" which I can give on request to Year 12 classes. It covers the whole of the "Inquiry question", and includes material on stalagmites and stalactites.

Recently, I was fortunate enough to lead a team of international researchers in a study that looked at the oxygen isotopes of cave drip waters. This is relevant to understanding the evidence of climate variation from measurements of the oxygen isotope composition of stalagmites and stalactites. This global analysis of cave drip waters has recently been published in the scientific journal Nature Communications. Australasian show cave sites, including Yarrangobilly Caves and Wellington Caves, have made a crucial contribution

Above—Wellington rainfall water isotope sampler. Rainwater was collected at Wellington at the nearby UNSW Research Station. The sample container can be seen in the left of the photograph, behind the weather station. Rainfall samples were collected monthly from the tap at the base of the sample container. Paraffin is added to the container to prevent evaporation, cable ties provide a bird roosting deterrent.

Left—Rainwater isotope sampler, Yarrangobilly. Just behind the kiosk you can find a weather station and a precipitation isotope sampler. Samples are collected after rain or snow events by NPWS staff for analysis by the ANSTO team led by Pauline Treble.

The paper synthesises previously published studies of cave drip water oxygen isotope composition. It investigates the extent to which the drip water oxygen isotopes match that in the surface precipitation (rainfall or snow). This is an important question for researchers looking at stalagmite records of past climate using oxygen isotopes and wanting to know whether they contain a record of past rainfall, or something else.

Australian caves that feature in the global analysis are:

- Cathedral Cave, Wellington;
- Golgotha Cave, Margaret River;
- Harrie Wood Cave, Yarrangobilly; and
- Little Trimmer and Frankcombe Caves in Tasmania.

The global synthesis compares already published cave drip water and rainfall monitoring data, specifically looking at the oxygen isotope data. Drip water and rainwater molecules contain both oxygen and hydrogen (H_2O). Each of oxygen and hydrogen have more than one stable isotope, which means they have oxygen and hydrogen of slightly different masses (weight). Scientists use these small differences to work out what climate and environmental processes have affected the water on the way from the atmosphere to the cave. The oxygen isotope is particularly useful, as it is preserved in speleothems - as the oxygen in the carbonate part of calcium carbonate ($CaCO_3$). Also in the paper, we used a computer model to predict the seasonality of groundwater recharge at many of the caves, using a new hydrological model of Andreas Hartmann (Freiburg, Germany). This helps tell us whether the drip water is the average of all rainfall that falls in a year, or whether it is a record of seasonal or episodic recharge

What did it show? For most Australian mainland sites, cave drip water oxygen isotopes are expected to have a recharge signal, with the drip waters preserving the oxygen isotope composition of the precipitation during episodic or seasonal recharge. For montane sites (such as Yarrangobilly Caves) and higher latitude regions (Tasmania and New Zealand) that are cooler, they experience less soil water evaporation and this limits any seasonal bias in drip water oxygen isotope composition. The drip waters here are representative of the annual average surface precipitation.

In other words, if you were interested in analysing a speleothem sample from a cave in Australasia, what would the oxygen isotopes show? It says that the oxygen isotope composition of speleothems from most of mainland Australia is likely to record information about past recharge events, as opposed to information about the surface precipitation. The exception is the montane regions of Australia and Tasmania, as well as New Zealand, where stalagmite oxygen isotopes should preserve a record of rainfall.

And in the past? The paper also considered how recharge might change with cooler temperatures in the last glacial maximum, around 20,000 years ago. Then we use climate model data that show that mean annual temperatures would be expected to be 4C to 6C cooler. However, not much changes in terms of how we might interpret oxygen isotopes in speleothems, as mainland Australia remains warm enough to expect seasonal or episodic recharge to dominate outside of the montane regions.

Lead author and ACKMA member Andy Baker (a.baker@unsw.edu.au) is very happy to answer any questions on the research. We thank all the show caves around the world who have supported the data collection that featured in this paper.

The technical paper is titled "Global analysis reveals climatic controls on the oxygen isotope composition of cave drip water". It can be accessed for free at https://doi.org/10.1038/s41467-019-11027-w and can be reproduced with appropriate attribution under its Creative Commons licence.

Above— one of the water sampling stations at Harrie Wood Cave

Below—The photo shows the water sampling set-up at Cathedral Cave, Wellington, on a collaboration between the local council

Reference: Baker, A., Hartmann, A., Duan, W., Hankin, S., Comas-Bru, L., Cuthbert, M.O., Treble, P.C., Banner, J., Genty, D., Baldini, L., Bartolomé, M., Moreno, A., and Pérez-Mejías, C., 2019. *Global analysis reveals climatic controls on the oxygen isotopic composition of cave drip water.* Nature Communications, 10, article number 2984

73rd Savannah Guides Field School – Atherton Tablelands, Queensland. 14-17 November 2019

Andy Spate

What a fabulous experience! Amazing diverse program! Wonderful, friendly people! Truly professional! So many fields of interest and expertise!

Their slogan – "Protectors and Interpreters of the Outback" Does ACKMA need something like that?

I was a guest at this school with my registration fee being paid for by Savannah Guides Ltd (SG Ltd) – ACKMA will be responding to this courtesy by paying the registration for Russell Boswell, Manager of Savannah Guides Ltd , at our conference at Jenolan next year. The ACKMA Committee agreed, not at my suggestion I hasten to add, to pay my airfare from Sydney – all other expenses were mine – travel from Hobart to Sydney, rental car, meals etc. The redoubtable ACKMA member Regina Roach was also in attendance.

Savannah Guides Ltd was established in 1988 (ACKMA was in 1987) and consists of groups – SG Ltd itself, many enterprises such as Capricorn Caves and Undara, and trained guides at various levels (https://savannah-guides.com.au/). They have been working on a strategic plan for more than a year. I have passed on their plan to Jodie Anderson as she heads our strategic plan group. They have a well-developed website with about 100 documents. A new cultural awareness web page was launched at the Field School – see https://savannah-guides.com.au/understanding-and-visiting-indigenous-australians/

Above—Fourty Mile Scrub National Park on the Savannah Way

Right—Savannah Guides banner with slogan

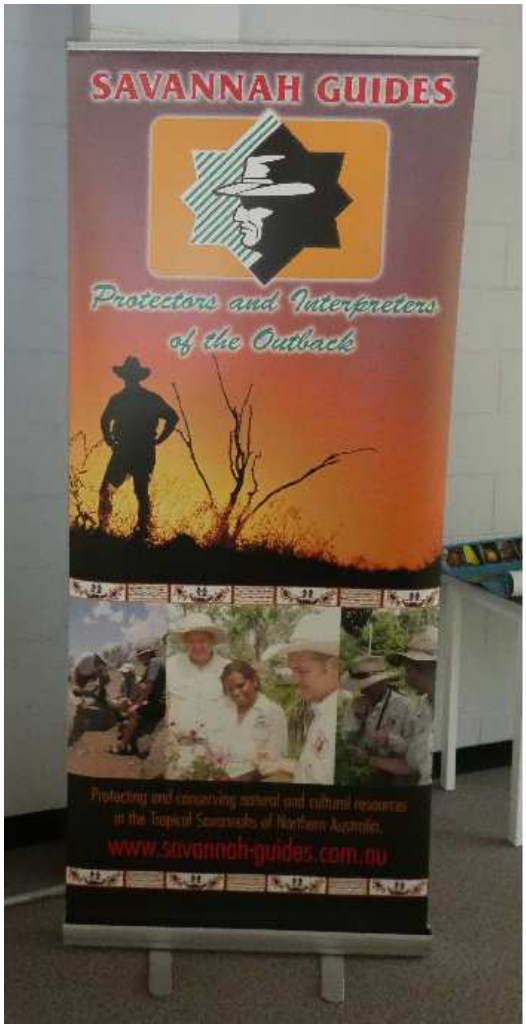
I believe ACKMA could learn much from SG Ltd – and maybe they from us?

The program was amazing and included four welcomes, eight half-hour talks, nine or more field excursions, seven 'Enterprise Updates' and a half-hour workshop cultural awareness session. Talk topics ranged from "Top Tax and Financial Tips for Tour Guides" to elephant ecology! Others included a fantastic geological/ecological evolution of the Wet Tropics World Heritage Area, a QNPWS Update, an account of South African tour guide training and my talk on ACKMA. I unfortunately missed the Friday events due to Korean work commitments.

If anyone wants to see a digital copy of the full program let me know. I can also make available the tax handout on request.

The Field School opened with four welcomes: to Country with a very heartfelt description of the Traditional Owners from Aunty Syb and Uncle Laurie – from the Tablelands Regional Council – from the President, Mick Clark, and from the Genazzano Resort which is a well-setup establishment for meetings such as this one. It is on the shores of Lake Tinaroo about 35 minutes' drive from Atherton.

After the welcomes, all participants stood and introduced themselves, their backgrounds and work sites on the first morning. It took a long time - some were quite verbose. We are going to try this at Jenolan next year but may have to have a heavy-handed chair!



The eight Enterprise Updates were accounts of happenings at each operation. These were:

- Outback Aussie Tours,
- Red Dirt Tours,
- Australian Age of Dinosaurs,
- Adels Grove,
- El Questro,
- Moreton Telegraph Station,
- Oz Tour Safaris and
- Undara Experience.

Field events included visits to the giant Cathedral Fig Tree, Nerada (Australia's biggest tea producer), the Tolga Bat Hospital (almost the highlight for me), tree kangaroo and platypus spotting, a ride on a historic train and a geological crater walk amongst others.

Other happenings included optional early morning bird watching and Tai Chi, afternoon 'camaraderie" sessions (BYOG), evening activities and a jam session around a campfire on the last night. I must mention the Twitchathon. Bird identification seems a major passion amongst SG people! On the first morning the group was divided up in teams to create bird lists – participation was made compulsory if you wanted to have the Field School dinner. Not being able to tell the difference between an Emu and a Sulphur-crested Cockatoo myself I was not much use. On Sunday morning the results were discussed by the lugubrious Ivor Davies (Undara) amid much merriment. Some groups got more than 120 species.

A brief AGM was conducted on the last morning. The Savannah Guides Ltd Board (=Committee) met on several occasions. One further interesting feature was that some meals, morning and afternoon teas were sponsored by the Life Members, Enterprises or individuals. I hope I am correct in assuming 'sponsored' = 'funded'.

All-in-all it was an illuminating, education experience, well-worth my time and, I hope, ACKMA's money.

Thank you to Russell and Sam – it was great meeting you and all my other new friends. Very much looking forward to seeing Russell, and potentially others, at Jenolan in May 2020.

Tolga Bat Hospital

Lightning visits to Chillagoe and Undara (and Yarrangobilly!)

Andy Spate

I took the opportunity while in Far North Queensland to visit places other than the Ganazzaro Resort. Lana Little provided logistic and much other support. Chillagoe was no more than a beer with Chillagoe guide Dave Hill and with Lana and her husband Tony – and to get my laundry done! Nice evening – except for the very loud peacocks next door through the night.

Then on to Undara Lava Tubes (pyroducts) to see what I had assumed from email discussions with Bram Collins to be a new disabled-access facility in Collins Road – it turned out to be the old system reported upon in the Journal many years ago. But some useful discussions and suggestions with the manager Kane Bassett. Kane is the single employee for four months over The Wet (summer) as visitor numbers are so low that accommodation and food services are not viable. We also saw some nice small calcite speleothems which I completely failed to photograph adequately.

We also went through The Arch and thence into Ewamian Tube. Nice geology and vistas. Five lucky visitors paid for an hour-long single-cave tour and got over two hours and two caves as Lana and I were there.

We then spent a day wandering about the Atherton Tablelands looking at various geological and giant tree sites. Next day Cairns – the Aquarium is wonderful as are the Botanic Gardens. Both well worth a visit.

Many thanks to Lana and Kane.

After a few family days in Sydney and Canberra I went onto my beloved Yarrangobilly at the invitation of Bernadette Zanet (the not-so-new manager) to do Q & A sessions with some of her guides. I spent a very pleasant few hours after my arrival sitting on the verandah of the 1917 (two-storey) section of Caves House answering emails (which could not be sent from the delightfully free of modern communication Yarrangobilly) and preparing this report.

The conundrum of graffiti

Tim Moore

The following article has been taken from the newsletter of the National Caves Association of America. It concerns the discovery of a graffiti signature by Samuel Clemens, on a cave wall—he being better known to us as Mark Twain. There is also following that an article by John Brush about graffiti cleaning in Cotter Cave.

In the September issue of this Journal note was made of (photographed) the signature a notorious Hunter Valley (New South Wales) bushranger, Frederick Ward, known as Captain Thunderbolt. He must have marked his name on the wall of main cave at Timor during the 1860s.

These three articles caused me to reflect on a conversation that I had had in the late 1980s standing within the circle of sarsen stones at Stonehenge.

In my then life as Minister for the Environment in New South Wales, I had been given a short fellowship by the United Kingdom Government to undertake inspections of sewerage treatment plants and other waste disposal facilities. I was asked, during the arranging stages for the visit, if there was anywhere in particular that I would like to see during my weekend off in the middle of my fortnight program.

I indicated that I would like to visit Stonehenge. This, I was advised, was easily arranged and, if I drove myself to this ancient monument, the officials at the Foreign and Commonwealth Office in London (who were arranging my visit) would ensure that a qualified guide would meet me and show me around. I was to be permitted to walk through the monument, a privilege not generally available because of the risk of damage by the very high visitor levels. Visiting members of the general public were (and remain) confined to a perimeter path.

On the designated day, I drove to the appointed meeting place and discovered that my guide was an eminent university professor who held the official appointment of Her Majesty's Curator of Ancient Monuments, an honorary title of some importance.

Photo: British Heritage

During the two or three hours I had with him (not only in the bounds of the ancient monument itself, but also looking over some of the now known to be associated pathways leading to the famous circle of stones), my guide and I engaged in a discussion of the problem of graffiti. I had enquired as to what, if anything, was to be done about the many, many names and dates that had been scratched into the sarsen stones.

First, he took me to one of the stones and picked a random name. I can no longer remember it. But, for the purposes of this discussion, let us assume that it was "Jay Carruthers, Liverpool, 1980".

During this discussion, he next took me to another of the sarsen stones and pointed to a name on it. The name inscribed, he said, was "+ Wren". My guide observed that this had been identified as having been graffiti by Sir Christopher Wren, the architect of St Paul's Cathedral in London. He said to me that this was graffiti when it was done but "Is it still graffiti or does it have significance and validity of its own?"

Photo: British Heritage

Having caused me to ponder the question of when, during the passage of time, Sir Christopher's name might have been transmuted from vandalising graffiti to having historic heritage and cultural value itself, I was invited to another of the sarsen stones to inspect a further inscription. This inscription, as I remember it, contained no date but said something like Quintus Fabius Maximus. My guide advised me that he was believed to have been a centurion in the Roman legions, the legions which had conquered Britain commencing with the Claudian invasion of 43 AD.

I confess that the latter of these latter two inscriptions was not able to be made out clearly by me but I took the word of the Curator as to the accuracy of what he had described. But then, I asked myself: "*How long did it take for the scratchings of young Quintus to become transmuted from ancient vandalism to an item of cultural heritage in itself*?"

Whilst I was pondering this conundrum, my guide took me back to the scratching of "Carruthers from Liverpool" and said to me, "*Let us assume that, in 25 years or so, Mr Carruthers discovers a cure for cancer. What does that do to his scratching upon this ancient monument, scratching which, in the context of you and I standing here now looking at it, is undoubtedly an act of vandalism*?"

Whilst, undoubtedly, whether in caves or elsewhere, graffiti is to be deplored and cleaning measures such as those reported upon, at Timor, in the September Journal reflect appropriate and desirable approaches by those who are community-minded enough to do something about it, I am still unable to resolve, in my own mind, what I might describe as the "Carruthers conundrum"!

Clemens Signature Found in Mark Twain Cave

166 years after Mark Twain left Hannibal [**Editor - in the US state of Missouri**], his childhood signature is found in an unlit passageway in the very cave named after the renowned author. Scholars have verified the signature's authenticity. Samuel Langhorne Clemens, whose pen name was Mark Twain, lived in Hannibal from 1839 to 1853 (ages 4 to 17).

When he published The Adventures of Tom Sawyer in 1876, the cave achieved nearly the same celebrity status as the author. Now Mark Twain has again put the spotlight on the cave with the discovery of a long-sought "Clemens" signature found in an unlit passageway.

"We have been looking for a Clemens signature for decades," said Linda Coleberd, whose family has owned the cave since 1923, "but with three miles of passageways, that means there are six miles of walls to examine. And with 250,000 signatures on the walls, looking for 'Clemens' has been like the proverbial needle in the haystack."

Prior to 1979, visitors to the cave frequently added their names using candle smoke, pencil, paint, or berry juice. Upon becoming a National Historic Landmark, signing the cave was no longer allowed.

The Clemens signature was discovered during a special tour in July, but Coleberd wanted to wait on announcing the news until scholars had the opportunity to compare the found signature to Sam Clemens's boyhood signature and those of his siblings. Unfortunately, only "Clemens" was scrawled on the cave wall in pencil, although higher resolution photos revealed the name "Sam" had first been carved in the location.

The discovery occurred during the third quadrennial Clemens Conference, a scholarly symposium held by the Mark Twain Boyhood Home & Museum. Scholars toured the cave on July 26th. Coleberd joined the last group with plans to veer off the tour with her friend and fellow signature-seeker, Cindy Lovell, who spotted the signature.

Mark Twain (Samuel Clemens) signature found in Mark Twain Cave.

The two frequently roam the cave with flashlights searching for "Clemens" and "Blankenship." Tom Blankenship was the Hannibal boy who became the model for Twain's famous character Huckleberry Finn.

"Linda and I have been looking for so long, it still seems unbelievable," said Lovell. "My single hope has been that someone would find it during my lifetime. Sam knew the cave so well and described it in exact detail. We just knew it had to be in here somewhere."

Lovell, who is the director of education at Epic Flight Academy in New Smyrna Beach, Florida, is best known in Hannibal as the former director of the Twain museum there as well as the former director of the Mark Twain House in Hartford, Connecticut. "I have been a 'Twainiac' since I first read Tom Sawyer in the fourth grade," she said, "and I have been looking for his signature in the cave since my first visit to Hannibal in 1996."

Lovell immediately shared photos of the signature with Twain scholars Dr. Alan Gribben and Kevin Mac Donnell who had also attended the Clemens Conference. Gribben thought it was most likely Sam Clemens's signature, with Orion and Henry (Sam's brothers) far lesser probabilities. The two scholars then undertook the task of researching signatures from the period Sam lived in Hannibal.

Gribben, a professor at Auburn University-Montgomery who has spent 50 years studying Twain's library and reading, said, "I am going to go on record as believing this to be Sam Clemens's handwriting. There are other considerations that would support this theory. Clemens would repeatedly refer to this cave in his mature writings, so we know he was often there and that it was an important landmark to him. Moreover, his temperament was far more egotistically assertive than those of either of his brothers, Orion and Henry, which makes it more likely that of the three he would be inclined to inscribe his signature on this site."

MacDonnell, a rare books dealer in Austin, Texas who owns the world's largest private collection of Twain first edition books, autograph letters, photographs, and artifacts, scrutinized signatures provided by the Mark Twain Papers & Project at The Bancroft Library, UC-Berkeley. Siblings Henry and Pamela along with cousin Jeremiah were quickly eliminated.

"That leaves us with Sam and Orion," said MacDonnell. "Both write their 'l' loop a bit shorter than their 'C.' While their letter formation and connecting strokes and baselines are similar, there are differences. In 1853 Sam is rounding the humps in his 'm' and sharpening them in his 'n.' He puts a very short tail on his 's.' You could almost lay a ruler at a downward slant over the tops of his 'C,' 'l,' and first 'e.' His 's' is the same height as his 'n.' Orion's signature displays none of these things, and the signature in the cave shares all of these traits with Sam's Oct. 1853 signature. The cave signature is very likely of an earlier date, possibly by several years, since Sam left Hannibal earlier that same year."

"Without Sam Clemens writing down the exact location or signing with his full name and dating the signature, we are left to make an authentic assessment of this signature with the help of scholars," said Coleberd. "Kevin MacDonnell suggested using a UV light to try to date it, so that is something we are looking into as well. Years ago, we authenticated Jesse James's signature, which was dated Sept. 22, 1879. In 2012, during one of our signature searches, Cindy Lovell found 'N. Rockwell' written on a wall about 30 feet from where Norman Rockwell sketched inside the cave in the 1930s. It would be interesting to examine all of these signatures with the UV light to see what else we can learn."

"Hannibal became a tourist destination 143 years ago when Twain published Tom Sawyer," said Gail Bryant, Director of Tourism. "This year, not only is Hannibal celebrating its bicentennial year, the Mark Twain Cave is also celebrating its 200th anniversary of discovery. We are thrilled that at long last Sam Clemens's signature has been found in the cave that was named for him."

The cave is open for tours year-round, but Coleberd is still trying to decide how to include the Clemens signature on the tour. Although electric lights were added in 1938, they are placed along the 5/8 mile footpath tour guides follow. The Clemens signature remained unseen because it is in a completely darkened area. So, figuring out how to share this new discovery will be the next order of business.

A young Samuel Clemens whose signature was found in Mark Twain Cave.

"I'm jealous of the owners of the cave," added MacDonnell. "I have signed books, letters, photos, legal documents, checks, autograph albums, and even an opera fan, but no signed cave--not sure where I'd put it if I did have one."

-o0O0o-

Ken Grimes Award—ACKMA 2020 Conference

Grant funding is available to support attendance at the May 2020 Conference at Jenolan.

The Honorary Life Members Fund will support one to two attendees with their conference costs. The fund is open to members and non-members. Students and researchers are welcome to apply, as well as others (such as leaders in guiding and interpretation) and attendees from neighbouring countries. There is no set format for application. Applicant must describe:

- **how attendance will benefit them (eg professional development),**
- **how their attendance will benefit ACKMA (eg a paper), and**
- **detail of the funding level sought.**

For more information, please contact Dave Smith (dave.smith.nz@gmail.com).

Applications will close 31 January 2020.

Applications are to be sent to the above email address.

ACKMA members are asked to circulate this information to students and researchers working at their local cave or karst site.

Cave restoration work at Cotter Cave, ACT

John Brush

Canberra Speleological Society Inc

Members of the Canberra Speleological Society Inc (CSS) have been working in partnership with the ACT Parks Service to remove graffiti from the Cotter Cave (ASF Index – PR 1) in the ACT. CSS is also conducting trials to see how effective it is to cover or disguise graffiti in areas that are too delicate or too difficult to clean.

As noted in the June issue of the Journal (Brush, 2019), representations to the ACT Government by CSS over many years achieved a significant milestone early this year when construction work on a new entrance barrier was completed. Not only was this structure more bat-friendly than its predecessor, but it was designed to be more resistant to illegal entry, thus paving the way, it was hoped, for remedial work on the extensive graffiti throughout the cave.

Cotter Cave, or Paddys River Cave as it is also known, has little more than 100 metres of passage, but it is easily the longest cave in the ACT. With its spacious passages (the main passage averages 6m in width and is generally 4 to 8m high), white marble walls and speleothem decoration, it would have once been a spectacular cave. And in fact, it once operated as a low-key show cave. Sadly, the cave has suffered greatly since those days. As noted in the earlier article, the cave had become a site for lighting fires, dumping rubbish, painting graffiti, mining speleothems and, apparently, for satanic rituals.

In 2016 and 2017, CSS conducted graffiti cleaning trials and developed a suite of techniques for removing painted graffiti from a range of cave surfaces. Our key objectives were to preserve historic pencilled signatures while removing (spray) painted graffiti using the lightest means possible. On some surfaces we found nylon bristle brushes (scrubbing brushes, kitchen brushes and even tooth brushes) and clean water were effective. For more stubborn graffiti we trialled a battery drill-powered rotary brush that had small abrasive particles embedded in thick plastic bristles. Where paint was thick and/or more securely bonded to the rock, we tried using wire brushes.

After the trials were evaluated, we held back from implementing a full-scale cleaning effort. CSS members realised it would be a futile exercise until such time as a more secure entrance barrier could be installed. Our concerns were justified. A site just inside the entrance that had accumulated five layers of graffiti, including three between 2001 and 2016 (see Figure 1), was the site of a cleaning trial in 2016 but was attacked again in late 2018 (see Figure 2).

Figure 1—This is a boulder just inside the cave entrance that had accumulated at least 5 layers of graffiti before cleaning in 2016

Figure 2—The same boulder as in Figure 1. A new layer of graffiti that appeared between April and November 2018 was scrubbed off in November 2019

The new entrance structure and gate completed in March 2019 has successfully withstood at least two attempts to break in. In addition, ACT Parks has committed to monitor the cave more closely and promptly repair any damage to the gate, which so far has been done.

In May 2019, CSS and ACT Parks initiated an extensive graffiti cleaning effort, commencing with two joint trips during which we instructed staff on cave-friendly cleaning methods. Since then, Parks has conducted two further trips, as has CSS.

On the cleaning trips we have used the full range of removal techniques noted above. The wire brushes are regarded as a last resort and their use is restricted to surfaces of bare rock, or to speleothems that are intermittently active so that any scratch marks will, over time, be covered by new layers of calcite.

We also use drop sheets and absorbent mats to capture runoff water, paint fragments and any loose bristles. In case any fragments or bristles are missed, surfaces below the cleaned areas are swept on the next trip.

Perhaps half of the graffiti that was present in early 2019 has now been removed. Examples of the cleaning efforts are shown in Figures 3, 4 and 5. Much of the graffiti that remains is

a) very firmly bonded to the rock,

b) in awkward positions that will require the use of ropes and ladders to access safely, or

c) is on delicate surfaces that cannot be cleaned without inflicting significant - and unacceptable - levels of damage on the cave (Figure 6).

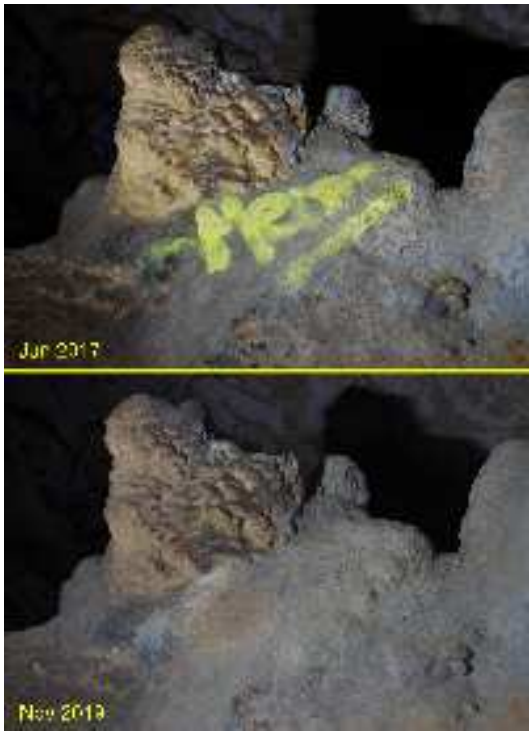


Figure 3—Before and after the cleaning efforts on flowstone at the base of a large stalagmite (above)

Figure 4—Before and after images of a flowstone area. As the spray paint was applied over dusty

Figure 5—A cleaning project in progress. The charcoal was easy to remove, but paint removal requires considerable effort. The green colouration is algae – the site is just inside the entrance (above)

Figure 6—An ACT Parks staff member and Marjorie Coggan examining an area of delicate dry cave coral and flowstone as a possible site for a graffiti masking trial

After onsite discussions with ACT Parks, CSS was given approval to conduct graffiti masking trials. But as a first step we needed to find a relatively cheap, effective, benign and completely reversible means of covering the graffiti. What we have come up with is a slurry comprising clean water, crushed limestone (as is found at garden centres) and a pale brown coloured potters' clay. The clay acts as a binding agent and is also useful for varying the colour of the mix. However, to make life difficult, the slurry changes colour as it dries. Slurry that starts as a pale grey-brown colour dries to an off-white. Initial application and removal trials on a garden wall at home were successful, so we moved to the cave in November.

Three sites were selected. One site was on bare white rock, another was on orange-coloured gossan - a fragile, deeply oxidised mineral layer - the third was a wall area partly covered in cream coloured cave coral and flowstone. A small paint brush was used to gently dab on the slurry.

The in-cave masking trials look promising (see Figures 7 and 8) for use on dry surfaces.

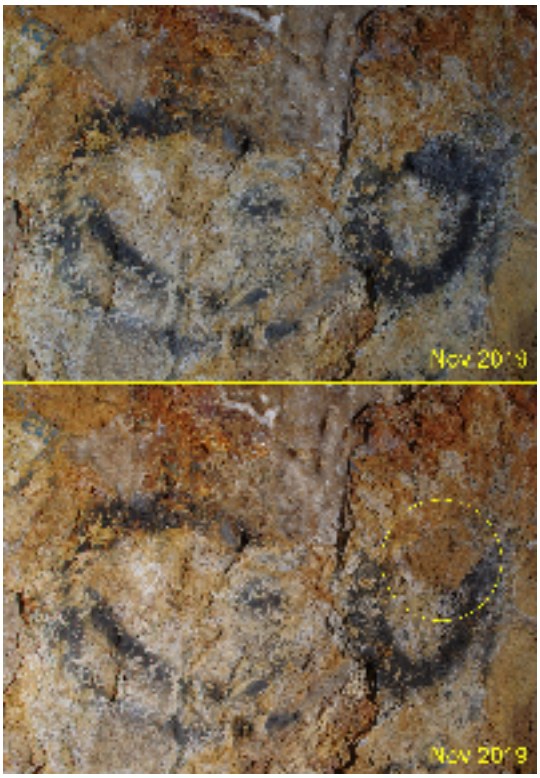
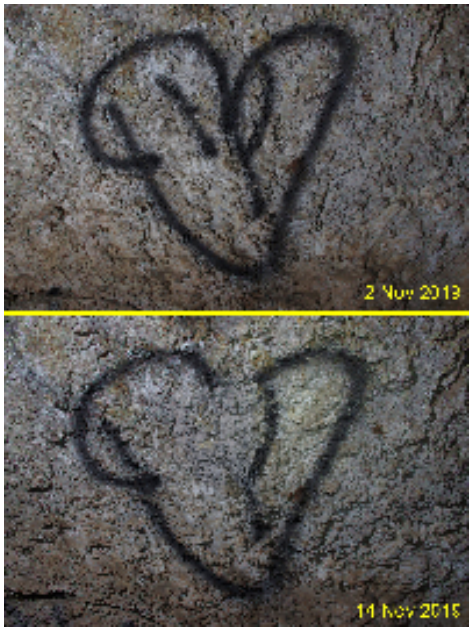


Figure 7—Graffiti masking trial on an area of fragile gossan material. Note: the area was once partly covered with a thin layer of flowstone that was chipped off between 5 and 10 years ago (above)

Figure 8- A closeup of a section of graffiti in Figure 6. Slurry mix was applied on 2/11/2019 and allowed to dry for 12 days before taking the second photo



The slurry worked well on the cave coral and also on the gossan, in part because loose gossan material from the floor was dusted over the test area immediately after applying the slurry. However, on the bare rock, the slurry mixture will need to be tweaked to lighten the colour. Our thinking is that we will need to purchase a range of clay colours and develop several mix ratios for different parts of the cave. To minimise the amount of trial-and-error colour-matching, we plan to make up colour cards so that we can compare the colour of dried slurry mixes with the cave walls.

Cotter Cave has suffered considerable damage over the years, especially in the last ten years. CSS is fully aware that missing speleothems and cut out sections of wall can never be replaced and that chiselled signatures on flowstone cannot be masked. However, we are confident that cleaning or masking of painted graffiti will significantly improve the appearance of the cave. Hopefully, the new entrance structure will continue to do its job and ACT Parks will continue to be diligent in dealing promptly with any attempts to break into the cave.

Reference

Brush, John (2019) Recent Developments at Cotter Cave, *ACKMA Journal 115*, June 2019, pp 25-27

Reminder

At the 2020 ACKMA Annual General meeting to be held at Jenolan Caves, vacancies will arise in the positions of President and Publications Officer (Journal Editor).

Launch of 2020 Cave Animal of the Year—Australian Cave Crickets

Cathie Plowman

Amidst great excitement we launched the 2020 Cave Animal of the Year in Hobart on Sunday 1 December 2019.

The 2020 Australian Cave Animal of the Year is Australian Cave Crickets, a group of 22 related species of cave crickets in the Australian family *Rhaphidophoridae*.

Australian cave crickets are wingless insects and can be found in limestone, lava and granite caves in both moist and dry areas.

The Australian Cave Animal of the Year is based on a successful campaign that commenced in Germany in 2008. The program seeks to raise awareness of the small, specialised and sometimes odd-looking animals that live in caves and are specialised to survive and thrive in a world with little or no light.

"Cave Animal of the Year" is growing and in 2020 there will also be programs in Italy, Switzerland and the United States to join those of Australia and Germany.

The 2020 Australian Cave Animal of the Year program has posters, bookmarks and stickers to raise community awareness of Australian Cave Crickets.

Our Cave Animal of the Year 2019 printed products won competitive design awards. The 2019 poster won three design awards and, as the 2020 poster is the same design, it is a work of art waiting to be displayed at your cave site or other public area.

Our 2020 posters, stickers and bookmarks are all free of charge and the mugs are $10 each. (Postage might need a contribution, depending on the amount.)

Three ways that you can help grow the program and help raise community appreciation of cave animals:

Order your Cave Animal of the Year supplies at lueena@bigpond.com

Promote our website address on your publications: www.caveanimaloftheyear.org.au

Like and share us on Facebook.

Above—2019 and 2020 Australian "Cave Animal of the Year" posters (Gabriel Kinzler)

Right—self-evidently, "The Cake" at the launch! (Kelly Eijdenberg)

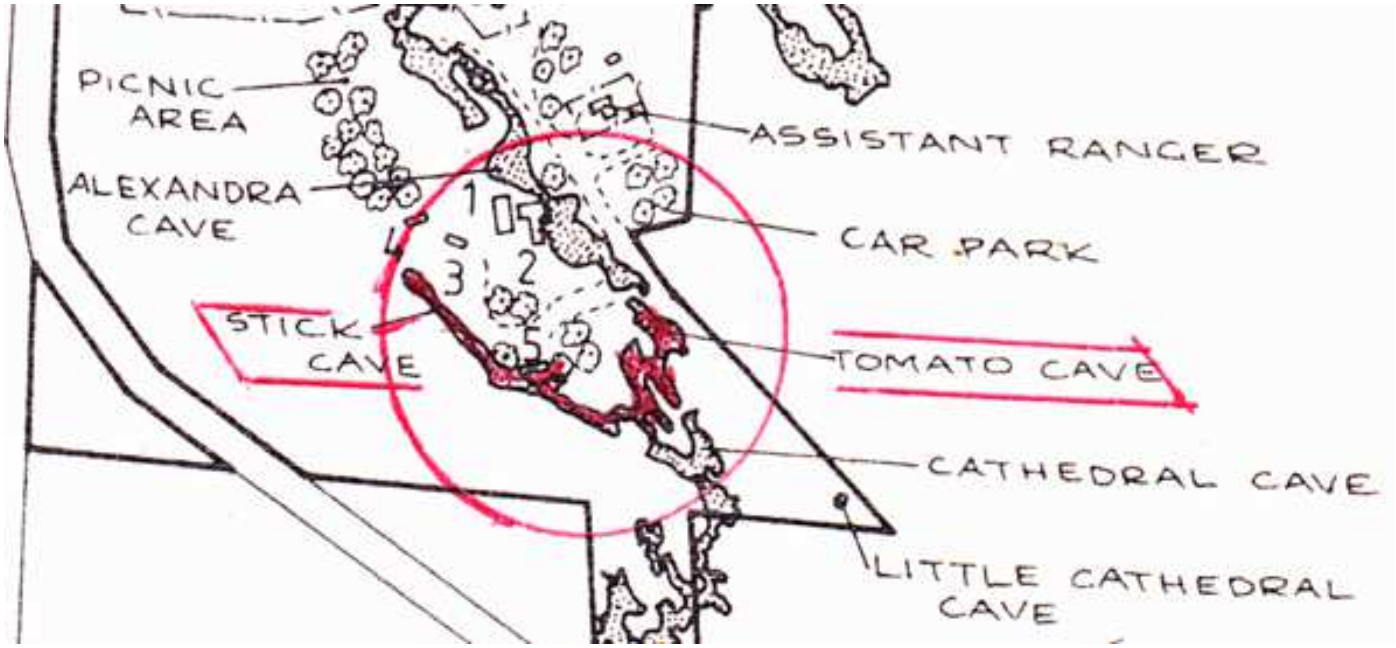
Above—Cathie Plowman (coordinator), Kelly Eijdenberg (graphic designer), Sam Lyne (illustrator) and Sil Iannello (cave ecologist) at the 2020 launch (Gabriel Kinzler)

Right—Anna and Ben Jackson cut the cave cricket cake at the launch (Gabriel Kinzler)

Fun in Stick and Tomato Caves – Naracoorte 1963

Dennis Rebbechi

In 1963, the Naracoorte Caves Reserve in South Australia was not quite Wild West Country, but was definitely primitive. Stick Cave was designated S 9 and Tomato Cave was designated S 10. In the Australian Karst Index 1985, they were combined as Tomato-Stick Cave, and Wet Cave was designated U 10 and described as being Pothole type, dry and having four entrances. It stated that development was interconnected passage and domes. Today, it is a developed self-guided cave experience.



The Editor of our Journal and Andy Spate have asked for contributions for the December Journal. I checked my memoirs for the period I spent in Naracoorte, as I remembered a funny, but serious, event that occurred during that period. I found my account of this event and have copied it verbatim below, without correcting grammar. Please note this article has no scientific value whatsoever.

MEMOIR EXTRACT.

On 17/8/1962 I commenced at Coles Naracoorte Store No 202 in South Australia as a D Grade Sub-manager on the princely monthly salary of Ninety-Two Pounds Six Shillings ($184-60).

I was keen on Caves and the Naracoorte Caves are amongst the best in Australia. Quite often on Sunday morning, I would rise at first light leaving Doreen and Suzanne sleeping and drive out of town to the Caves Reserve. There was a cave out there known as Stick-Tomato Cave that had two pothole type entrances behind fences. From each entrance you could climb down into the cave. A road ran over the top of the cave. I would climb down into the Stick entrance on the west side of the road and emerge on the east side of the road exploring along the way. Over time I became very conversant with the layout of the cave. There was a very low roof in one section that may have led to the cave having two names. At the Tomato end you ascended a narrow open path until you reached the ladder to exit the cave system. This was perhaps the only dangerous spot in the cave, but with light it was not a problem.

I always took three alternate sources of light. I took a carbide lamp, a candle in a holder and waterproof matches in one of my pockets plus a torch. The carbide lamp had a running life of about ten hours before running out of water, although there would usually be plenty of carbide remaining. Most times there is water in caves, so you could use your torch until you refilled the water chamber of the lamp. The lamp had a flint mechanism, so it was easy to restart. This cave was about 500 m in length.

Left and Below—Photos insert into memoir by author for illustrative purposes only.

They are not the original items of equipment carried by him!

One Sunday morning I did not arrive at the Caves Reserve until after 8.00 am. I descended via the Stick entrance. I had gone quite a way along the passageway when I could faintly hear someone calling. Caves have remarkable acoustic characteristics. There are never any echoes. As I moved further, the yelling became louder. I called back. I could hear voices calling that they were lost.

I found them in the low roof area, in the dark. There was a guy and his girlfriend. As they had crawled, the guy had laid his torch on the floor while helping his girlfriend crawl through the low roof section.

She apparently crawled awkwardly and kicked the torch that rolled away and extinguished. Panicked, they felt around, crawling backwards and forwards in the low area and losing all sense of direction. With my lamp, I soon found their torch that had rolled into an even lower area against the cave wall. I reached in and pulled it out.

I guided them to the Tomato exit. The girl, using my torch, was almost panic stricken as we ascended the open path with the drop on one side. Outside the cave I gave them a good spirited lecture. I pointed out that although the caves were not securely sealed off, the public were not really supposed to enter them. In fact, very few people did. If I had not come along, they could have been inside until someone who knew where they had gone raised the alarm. I could tell by the expression on their faces that no one knew where they were.

They realized that without the torch, they would never have found their way from the cave. I explained the three principle – always have three sources of light and never explore with less than three persons in the group. If one person became sick or injured, the second person can stay with that person while the third goes for help. The girl smiled and suggested that they were lucky that I had not waited until I had two other guys to come with me that day.

I admitted that familiarity tended to make you careless with the rules, but showed them the candle holder and matches in my overall's pocket. I told them that my wife knew where I was, and what time to expect me home. The girl sheepishly handed me back my torch. I recommended that they take a tour of the Victoria Cave before leaving because it would make their day worthwhile.

Next day I was helping Miss Burmeister, the window dresser to change the display in the windows to feature the new specials, when the guy and his girl wandered in the door carrying a box of Southwark Beer. They had waited until the Pub opened to buy the box to thank me, not only for the rescue but also because they had really enjoyed the Victoria Cave tour. I think it took Lou and me three nights to drink that box at our end of day meetings.

LATER MEMOIR EXTRACT FROM 8 JANUARY 1989

Carol and I were on duty at Shades of Death Cave at Buchan, Victoria on a stinking hot day. We had one group just after 11.00 am. Geoff, Graham and Warren decided about 2.00 pm that the Buchan Pub had more to offer than the Cave. Carol brought sandwiches from our house. I brought cold stubbies from the Engine Room Fridge. Eventually Sylvia who was playing on the swings yelled that a man and woman had arrived.

They were about my age. I gave them a good tour. The temperature made it great inside the cave. I switched off all the lights and explained how without light, you were hopelessly lost. The guy said that they had once been lost in a cave in Naracoorte. The bells rang and I said "you must be Dwayne." What an amazing co-incidence! Back in the Entrance, I gave them a stubbie each. Carol had to explain that she was my second wife. Dwayne had married the girl whose name I had forgotten. Deidre talked to Carol while I proudly showed Dwayne our huge 75KVA generator. A stinking hot day became a day to remember.

AFTERTHOUGHT

Unfortunately, once Coles moved me to another store, I never visited Stick-Tomato Cave again. I passed through Naracoorte 7/6/2016, but the cave was closed and I could not enter. Earlier this year, I had booked to go to the AGM and spend extra days in Naracoorte. Unfortunately, my brother took ill and I had to cancel. Hopefully, I will eventually repeat the trips of 1962 and 1963.

THIS ARTICLE HAS NO SCIENTIFIC VALUE. WHEN WITH YOUR WIFE, IT IS ALWAYS WISE TO NEVER REMEMBER ANOTHER WOMAN'S NAME.

2021 is the International Year of Caves and Karst

This will be the biggest and most important speleological event ever. Participation as part of the global cave and karst community is crucial. The purpose of the International Year of Caves and Karst (IYCK) is to teach the world about the importance of caves and karst. Public understanding and support of caves and karst is currently very limited. As a result, funding, regulations, and opportunities for exploration, research, and management are also very limited. The International Union of Speleology (UIS) has declared 2021 as the IYCK in a major effort to make the world aware of how caves and karst are valuable to all people. To make this possible, the UIS is calling on all of its member countries and other organisations to begin planning a series of public lectures, programs, demonstration of techniques, and others activities for 2021.

The IYCK website is now open at http://www.iyck2021.org. It is designed to teach the public about caves and karst, and so it has a great amount of educational information. It also has information on how to become involved in the IYCK.

Wellington Caves

The new Visitor Experience Centre

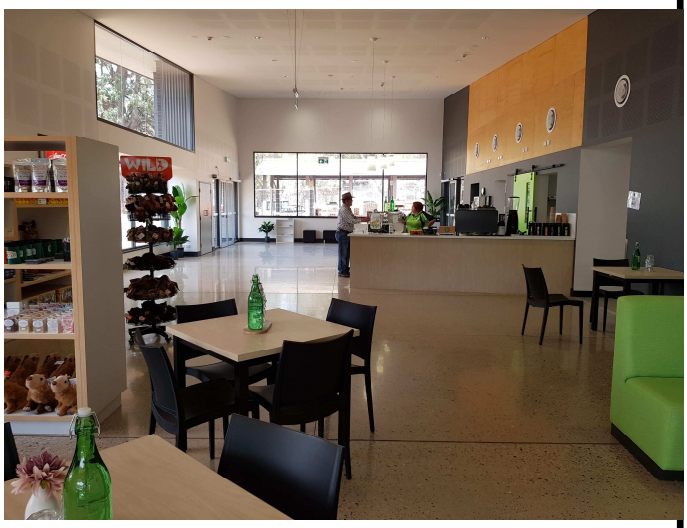
Ian Eddison

The Wellington Caves team moved into the new Visitor Experience Centre on the 22 November 2019. It was not an easy task to move the temporary operations office from the Caravan Park including caravan park reception as well as souvenirs, tour ticket systems and the kiosk kitchen. We gathered together a small team to make it all happen. The building is so roomy compared to what the team is used to and there is considerable open space which is yet to be filled such as the Megafauna room, a Fossil Store and Discovery Lab. Some of these have furniture on order, some are yet to have interpretive concepts to be developed into reality.

The room for the Fossil Store may yet have some other interpretive space included.

We are at an exciting stage for development of these things including new activities for schools in the Discovery Lab. We also have recently installed a new ticketing operation with 123Tix including the ability for visitors to book online. Our meet and greet, ticket scanning and new entry to and exit from tours has also meant some changes for staff to adapt to. There are numerous changes being implemented.

We look forward to the next holiday period with enthusiasm and hope our ACKMA members will be able to call by sometime.



Above—The new reception area

Left—The new building (both photos—Ian Eddison)

Call for conference papers and posters

Abstracts of papers and posters are required for production of the Conference Handbook so that participants are aware of what is on offer. To enable Scott and his colleagues to produce the Handbook in good time, abstracts must be received by 23 March. Presentations are welcomed from all members. Management-oriented presentations and posters are preferred but, of course, others are welcome.

There will be a mix of two 45-minute plenary presentations and 20 or 30 minute presentation slots as well as workshops on the ACKMA strategic plan development.

Jenolan will make a room available for your posters. There is a time slot in the program for viewing and discussions of your wonderful posters.

Abstracts of papers and posters should be in 11-point Times New Roman, otherwise un-formatted and no more than 500 words. The abstracts should be sent to me at president@ackma.org as soon as possible. But certainly, no later than 23 March. The earlier I get the abstracts the sooner Julia James, Jacob Hartley and I can organize a sensible program. If you are thinking of a presentation or poster it would be good if you sent a draft title to give us an idea of what subjects might be covered so that we can start thinking about the arrangement of papers. Obviously those titles could be changed when you submit your abstract.

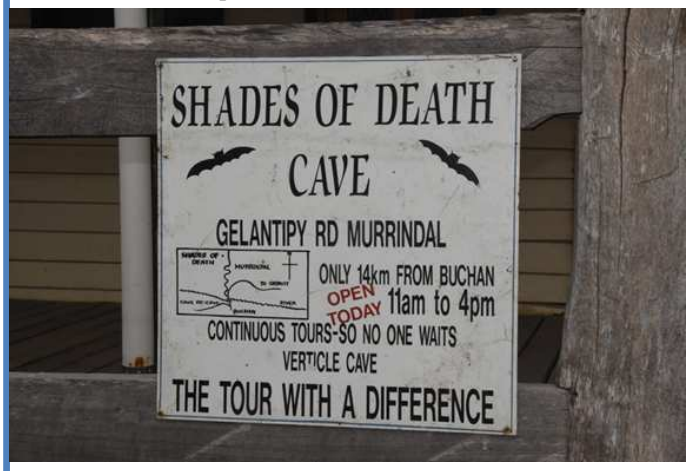
Presenters should be aware that written papers will be needed immediately after the conference for production of the valuable Conference Proceedings. The papers will need to be produced using the ACKMA proceedings template and instructions – both can be found on our website. Poster abstracts should also be provided for inclusion in the Handbook.

Shades of Death Cave Reopening

Nicholas White

Rimstone Co-operative Ltd purchased the Shades of Death Cave from the original developers in 2017. Since then Rimstone members have spent effort in two directions. The first was to raise the funds to cover the purchase. The purchase has been facilitated by the ASF Karst Conservation Fund which agreed to have the project tagged so that donations for the purchase were remitted to Rimstone. The second direction was to renovate the infrastructure. Metal steps and rails needed rust treatment and painting. Wooden steps were replaced with recycled plastic planks. Many protective panels were replaced. The work on the cave infrastructure was undertaken by Daryl Carr and co-operative members. The entrance lobby to the cave has been reroofed. Miles Pierce corrected a faulty voltage regulator in the generator and checked through all the cave lighting. As yet there is no intent to make any major changes to the lighting or the infrastructure.

An Open Day was held for members and community on 2 November 2019. This was to celebrate the change in ownership with the original developers and the community. The cave was first discovered in 1900 by Ernst Henham. The entrance pitch was first descended by Frank Moon with Ernst Henham's sons, Bill and Tom. A number of Henham relatives attended the opening. The East Gippsland MLA, Tim Bull, opened the cave and led the first tour of the cave, admiring both the size of the cave and the prolific formations.



Sign from 1990s tours (Robert Brain)

Present were the past owners who were pleased that Rimstone was taking over responsibility for the cave. These were Geoff Rebbechi and Graham Shaw. Also present were a nephew, Darren Camp, as well as Dennis and Carol Rebecchi's daughter, Sylvia Rebbechi. Dennis Rebbechi was unable to extract himself from his Queensland island. Kent Henderson, who wrote a guidebook to the cave, was overseas and apologised.

Currently, there is an intense program of exploration of the cave which is over one kilometre in length. This survey is building on the Van Dyk's original survey. The major interest in the survey is to establish the relationships to an inflow cave, M-2, and an outflow cave, M-4, near the Murrindal River. The survey will also identify areas needing track-marking or cleaning. Speleothem samples from the cave are currently being analysed to establish their age. This will enable a better understanding of karst processes in the Buchan-Murrindal karst area.

Perspective over rift with formation and painted railing (Robert Brain)

Rimstone intends to conduct periodic Open Days and educational use of the cave, as well as providing opportunities for adventure caving.

A special edition of the Rimstone Newsletter with some of the cave history was produced for the Opening. It is available at http://rimstone.org.au/fi.../RimstoneNews-30-M3-OpenDay_v2.pdf

Decoration at bottom landing with plaques recognising early developers (Robert Brain)

23rd Conference on

Australasian Cave & Karst Management

"2020 Vision for Cave & Karst Management"

Jenolan Caves NSW Australia 3rd – 8th May 2020

Registration Form

(Please complete one form per person)

Name: (Mr/Mrs/Ms/Dr)	
Are you an ACKMA Member? *(See below *)*	**Yes / No**
Address:	_____ _____ _____
Email:	
Phone:	**(M)** **(Other)**
Other organisation/s you are representing: *(if applicable)*	_____ _____
Dietary Requirements:	
Other issues we may need to know about: *(confidential)*	_____ _____

**** Membership of ACKMA is required for attendance at the conference. Non-members may register but must become members. Any person registering who is not a member will be able to join & pay membership dues at the conference.***

Payment for attendance at the 2020 Conference (*early special*): **$ 660.00** **$_____**

Option - Without breakfasts: **$ 570.00** **$_____**

(for payments received by 31st March 2020)

Payment for attendance at the 2020 Conference: **$ 710.00** **$_____**

Option - Without breakfasts: **$ 620.00** **$_____**

(for payments from 1st April 2020)

Conference Day Rate: **days at $ 160.00 per day** **$_____**

Unisex Conference T-Shirt (select size & indicate quantity @ $15.00 each) **$_____**

The design is our conference logo printed on a black T-Shirt

S		M		L		XL		2XL	

(Please note sizes may run a little small)

Total Payable/Enclosed **$_____**

Payment Methods

All payments must be paid in full as we are unable to accept part payments.

By Credit Card ***(Visa & MasterCard only)***

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Card Number ***(16 digits)***

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Expiry Date

CCV Number **(3 digits on the reverse of the card)**

If paying by direct bank transfer or over the counter deposit, please see details below:

Account:	**Jenolan Caves Accommodation Account**	
Bank:	**Westpac**	
BSB:	**032 001**	
Account:	**11 5404**	
Swift Code:	**WPACAU2S**	***(for overseas payments only)***

Please reference your payment with ACKMA followed by your surname and initial

e.g. ACKMA Smith W

and email the deposit receipt to scott.melton@jenolancaves.org.au.

Receipts will only be issued upon request
All bank fees are the responsibility of the conference registrant

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If paying by cheque, please make cheques payable to *"Jenolan Caves Reserve Trust"* and post to:

Scott Melton
ACKMA 2020 Conference
Locked Bag
Jenolan Caves NSW 2790

Contact details for the Conference Convenor Scott Melton

***scott.melton@jenolancaves.org.au* or**

Ph. +61(2) 6359 3926 Fax. +61(2) 6359 3307

Transport to Jenolan Caves

Conference registrants will need to make their own way to Jenolan Caves as we are unable to run a coach from Sydney Airport. We will however, be arranging minibus shuttles from Mt Victoria Railway Station on Sunday 3rd May. Each minibus seats 11 passengers so luggage space will be at a premium. We will arrange extra trips if demand warrants. A return service will leave Jenolan at 8.30am on Saturday 9th May.

Conference registrants will need to make their own way to Mt Victoria station and factor this into their flight/travel requirements accordingly. The indicative return train fare from Sydney Airport to Mt Victoria is about $52.00*; further train information, including timetables, can be found at www.transportnsw.info. *(* includes airport station access fee)*

☐ **Please indicate here if you require minibus transport to and from Jenolan Caves.**

Please contact the Conference Convenor for public transport options to Jenolan Caves

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Accommodation Bookings

Bookings for accommodation can be made by contacting our Caves House Group Bookings Manager Trish Sanders via groups@jenolancaves.org.au or (02) 6359 3900. Details of the various room types can be seen on the Jenolan Caves website www.jenolancaves.org.au however, *we ask that you enquire and book directly with Trish and mention you are an ACKMA member* to ensure that you receive the discounted room rate. The discounted rates are as follows and are on a per night per room/cottage price and they only apply if you book for the six nights (Sunday- Friday nights inclusive): -

Caves House Hotel	
Grand Classic	$164.00
Classic	$118.40
Traditional	$ 72.80

Other Accommodation	
Gate House	$ 28.00
Mountain Lodge	$106.40
Jenolan Cottages	$144.00
Bellbird Cottage	$320.00
Binoomea Cottage	$400.00

All accommodation options have differing bedding/room configurations so check with Trish as to which type will suit you and your group the best. Should you wish to share, this can be arranged as well!

A credit card number will be required at the time of booking however; payment will not be required to be made until you check-in. Should you wish to arrive earlier or stay later than the conference dates, please let Trish know so that the discounted rate can be applied. Please note however, prices are higher on a Saturday night.

☐ **Are you interested in wild caving at Jenolan on the weekend prior to the conference?**

☐ **Are you interested in a day trip to Wombeyan Caves on Saturday 9th May?**

Please note that this is the draft program

and it is subject to revision.

ACKMA 2020 Conference Schedule

Sunday 3rd May 2020

2.00pm	Conference registrations open in the Kanangra Boyd Room Sign up for afternoon activities. A comprehensive programme will be available from the 1st February 2020.
5.00pm	Join us on the Café balcony for cheese, meats, olives & other treats sponsored by our Conference Convenor Scott Melton
6.00pm	Welcome BBQ hosted by the Jenolan Caves Rural Fire Brigade
8.00pm	Free time for socialising

Monday 4th May 2020

7.30am	Breakfast in Chisholm's Grand Dining Room
8.50am	Housekeeping
9.00am	Welcome to Country
9.10am	Official Opening
9.30am	Paper Session One – Plenary Papers 9.30 10.15
11.00am	Morning Tea
11.30am	Paper Session Two 11.30 12.00
12.30pm	Lunch
1.30pm	Afternoon Activities Join us for an afternoon of show cave or adventure cave tours such as the Plughole or Aladdin or a karst walk to introduce you to the Jenolan Caves karst features. Other options will also be available.
6.00pm	Dinner in Chisholm's Grand Dining Room Thai inspired two course dinner
7.30pm	Pre – AGM Committee Meeting Kanangra Boyd Room
8.00pm	Spotlighting with Dr. Anne Musser or Optional tour of the Chifley Cave with Dr. Julia James.

Tuesday 5th May 2020 – "Behind the Scenes at Jenolan Caves"

7.30am	**Breakfast in Chisholm's Grand Dining Room**
8.50am	**Housekeeping**
9.00am	**Paper Session One**
	9.00
	9.30
10.00am	**Morning Tea**
10.30am	**Paper Session Two**
	10.30
	11.00
11.30am	**Question & Answer Session with Jenolan Caves Management**
12.00pm	**Lunch**
1.00pm	**Behind the Scenes tours of Jenolan Caves including Cave Operations, Maintenance, Food & Beverage, Housekeeping and Hotel Operations or**
	Join a tour of one of our show caves (subject to availability)
7.00pm	**Dinner in Chisholm's Grand Dining Room**
	Italian inspired two course dinner (pizza, pasta & lasagne)

Broken column in Lucas Cave

Wednesday 6th May 2020

7.30am	Breakfast in Chisholm's Grand Dining Room
8.50am	Housekeeping
9.00am	Paper Session One
	9.00
	9.20
	9.40
	10.00 Panel Discussion
10.20am	Morning Tea
10.50am	Paper Session Two
	10.50
	11.10
	11.30
	11.50 Panel Discussion
12.10pm	Conference Photo in front of Jenolan Caves House (or other suitable location)
12.30pm	Lunch
1.30pm	Paper Session Three
	1.30
	1.50
	2.10 Panel Discussion
3.00pm	ACKMA Annual General Meeting
6.00pm	Dinner in Chisholm's Grand Dining Room
	Roasts, Salads & Vegetables two course dinner
7.30pm	ACKMA Post AGM Committee Meeting

Thursday 7th May 2020

7.30am	Breakfast in Chisholm's Grand Dining Room
8.50am	Housekeeping
9.00am	Around the Show Caves Presented by Jordan Wheeler & Dr. Julia James
10.30am	Morning Tea
10.50am	Free Time
12.00pm	Lunch
12.30pm	Afternoon Activities Join us for an afternoon of show cave or adventure cave tours such as the Plughole or Aladdin or a karst walk to introduce you to the Jenolan Caves karst features. Other options will be also be available. Optional afternoon trip to Mayfield Garden (limited places and garden entry will be at your own cost)
7.00pm	Dinner in Chisholm's Grand Dining Room Mexican inspired dinner

Mayfield Garden Scene

Friday 8th May 2020

7.30am	Breakfast in Chisholm's Grand Dining Room
8.50am	Housekeeping
9.00am	Paper Session One
	9.00
	9.20
	9.40
	10.00 Panel Discussion
10.20am	Morning Tea
10.50am	Paper Session Two
	10.50
	11.10
	11.30
	11.50 Panel Discussion
12.10pm	Lunch
1.00pm	Poster Session
	Visit Wallaby Hall for a viewing and presentation of posters.
2.00pm	Afternoon Activities
	Show Caves and Adventure Caves and other activities
7.00pm	Conference Dinner – Chisholm's Grand Dining Room
	Three Course Dinner
	Speeches & Silent Auction
10.00pm	Conclusion of Conference Dinner
Midnight	Bar Closes

Saturday 9th May 2020

7.30am	Optional breakfast in Chisholm's Grand Dining Room
	$21.00pp - this breakfast is not included in the conference fee
8.30am	Mini-bus transfer to Mt Victoria railway station
8.30am	Join Jacob Hartley and Dr. Julia James for a day trip to visit the magnificent marble caves at Wombeyan
	Contact Jacob Hartley for further information
	jacob.p94.hartley@gmail.com

Mysteries at Baker's Swamp, NSW

Compiled by Deb Carden

On 4 August 2019, Orange Speleological Society (OSS) members, Bruce Howlett (Trip Leader), Club President Denis Marsh and members, Ian Curtis, Gareth Thomas and Deb Carden, visited Baker's Swamp karst (about 20 kilometres south of Wellington Caves). It had been several years since Bruce, Denis and Ian had been to the site and they wished to check cave tags against club maps and records.

A search of OSS archives subsequently unearthed dates of previous OSS visits to Baker's Swamp and this has provided an historic summary. Of interest is that there have been some palaeontological and invertebrate investigations at the site.

Of human interest is an article that Bruce had found on Trove, which he read out as the party stood by a particular cave. The 1882 *Bathurst Free Press and Mining Journal* (article included later) sheds some light on the discovery of human bones found in a Baker's Swamp cave, around 1867. A mystery remains though – who really was this man?

A potted history of OSS excursions to Baker's Swamp karst. Scientific investigations are noted.

- 20 May 1956: First visited. Bakers' Swamp is recorded then as having an apostrophe after the 's' (plural).
- 1977: A trip to Columbine is mentioned in the Secretary's book at the January 1977 meeting. No details; no trip report (T/R).
- 27 March1977: T/R plus a mud map to the area in Descent #2 1977 (John Druery).
- There is no further mention of trips in the 1970s and 1980s.
- 1985: In the Australian Karst Index the area is spelt with an apostrophe. Only one cave is listed: BS1 Baker's Swamp Cave.
- 2 and 3 January 1998: An article (ed Denis Marsh) on a trip to the Baker's Swamp area in OSS Newsletter No 6 in January 1998.

  Columbine (aka Lake Cave) (BS 9) and Baker's Swamp Cave (BS 1) are mentioned and described. Lee Thurlow "has been spending a bit of time in this area, has located a number of small caves and trying to locate others."

  There is a second article in the same newsletter, "Bone Deposits Found in Bakers Swamp Cave", stating that scientists visited the cave in January to investigate. It noted that, "Lee Thurlow will be taking a group of palaeontologists and geologists into the cave again on 18 February '98 to do some further investigation and sampling. They include Dr Lawrence Sherwin (Geologist, Department of Mineral Resources), Dr Armstrong Osbourne (Department of Geology, University of Sydney), Dr Peter Mitchell (Head of Physical Geography, Macquarie University), Dr Mike Augee (Palaeontologist, University of New South Wales), and Andy Spate (Karst Investigations Officer, NPWS)."

- March 1998: In OSS Newsletter March 1998 there is a Baker's Swamp Report by Lee Thurlow and an appended newspaper article and photograph from the Wellington Times, 20 February 1998, headlined "Amazing Cave Discovery - experts fear plundering of fossil site". Lee Thurlow and David Westbury took a group of professional people to Bone Cave (BS 7) and Columbine Cave (BS 9) (on 18 February 1998). As well as the aforementioned Drs Sherwin, Osbourne, Mitchell, Augee and Andy Spate, the group included Ms Kay Oxley and Ms Liz Morgan from the Department of Mineral Resources. After exploring the caves and speaking to the property owner, it was suggested that maybe OSS could put a gate on the Bone Cave with the help of the property owner.
- 4-5 April 1998: Denis and Bruce visited the area looking at Euchareena, Stuart Town and Baker's Swamp.

1. Bruce's T/R: Members present - Denis and Bruce. "*We met with the property owner and went to the 'Bone Cave' to discuss and plan the installation of a gate to protect the bone deposit. We investigated several locations within the cave but none proved to be suitable. It was decided to construct the gate at the cave entrance. A design was agreed upon and will involve the filling of part of the entrance in addition to the gate*".

- June 1998: Monthly meeting recorded: "A trip is proposed to Baker's Swamp on 16th May to fit a gate on Bone Cave. D. Marsh T/ L. Will need cement, steel."

The gating was undertaken, with the property owner supplying the steel and Denis doing the welding in situ.

- 6-7 March 1999: A trip to Baker's Swamp (no T/R) as part of the National Heritage Trust Project (NHT). It was an ASF-funded project to locate and record all limestone areas in New South Wales. Bruce was the organiser with Peter Dykes.

NOTE: Andy Spate advises he and Stefan Eberhard investigated various sites in New South Wales searching for invertebrates. Article published and sent to cave clubs.

- 5 July 2003: T/R to Stuart Town (Merrimount), Rip 'n' Rain and Baker's Swamp. BS 1 entered and described. BS 40 doline visited (In OSS Newsletter February 2004).
- 4 August 2019: T/R x 2 to Baker's Swamp. Members Present: Bruce Howlett (T/L), Denis Marsh, Ian Curtis, Gareth Thomas, Deb Carden (Ian and Denis; Gareth has photographic data).

The site is a drought-affected, nearly grassless paddock with limestone outcrops, hollows and shallow caves. Close to the boundary, we found the wired entrance of BS 2 into which Denis and Gareth clambered. They estimated 6-metre depth and found three frogs, a fragmented turtle carapace and a plastic flower pot at the bottom. A few metres' further on was BS 3, bottomed again by Denis and Gareth. A similar descent depth, though slightly more challenging. Nearby, BS 11 is a shallow, unpromising one-metre drop that was summarily dismissed as having no potential.

Further on was Lake Cave, BS 9. Before we entered, Bruce produced his mobile phone and read out the interesting historical newspaper article he had found on "Trove", featuring a rural worker who used to spend time in the cave when on the "rantan" (see article below).

Upon descending, the older OSS members found the cave drier than remembered, though Ian estimated the lake to still be about a metre deep. Gareth got excited about some oolites and Denis about a handful of small, unidentified bones.

<u>Top</u>—The bones found in Lake Cave
<u>Above</u>—Dennis Marsh (right) in BS 8; Ian Curtis near BS 31 and Deb Carden approaching

A trog along the nearby creek for a hundred metres or so didn't find caves or numbered features, but large carp were observed swimming leisurely in the shallow blue-green creek water. Bone Cave (BS 7) was located nearby. The entrance was unusually bright green with ferns and moss and the cave was breathing moist air. The second mystery of Baker's Swamp is that there was no sign at all of the cave gate. Bruce, Denis and Gareth climbed inside, observing there was no evidence of recent entry and few bones were seen.

When not climbing into holes in the ground, we trogged the paddock, locating and GPSing tagged holes:

BS 24: Wire-covered slot near Bone Cave. Not much potential.

BS 25, BS 26, BS 27: Three features near each other but no enterable holes.

BS 28: The same.

BS 6, BS 31: Two vertical limestone slots a couple of metres apart, linked below. Not descended. Ladder or rope required.

004: A shallow depression, wire-covered, no potential. GPSed.

BS 12: The "CO2 Cave". Denis and Gareth went part way down before Denis stalled above a descent that would have needed a ladder or rope access. Bruce had some figures suggesting 18-metre cave length with vertical range of 10 metres.

Inspecting the entrance to CO_2 Cave—4 August 2019
Left to right—Dennis Marsh, Deb Carden and Bruce Howlett

BS BS 13: A slot that Gareth descended to a small solution hole that went nowhere.

BS 14: Not much.

An untagged, similar feature nearby.

BS 4: A relatively large, blind doline on the top of the hill.

Day's end concluded in the Mumbil pub, washing down the dust of the day.

March 1, 1882: Bathurst Free Press and Mining Journal (New South Wales 1851-1904)

WELLINGTON. STRANGE DISCOVERY. The Gazette of Wednesday contains the following report of evidence taken at an inquest before the local Police Magistrate, on view of human bones which had been discovered in a limestone cave in the locality:

Constable Healey produced a portion of the skull, the left thigh bone; the right shin bone and one of the wrist bones of a man, which had been discovered in a cave. There were some other pieces of bone and part of two bottles— one the bottom of a porter, and the top of a pickle bottle. Constable Healy had visited the cave, but was too large a man to get into it.

William Gough, a fencer, stated he had discovered the bones in a cave shown to the Magistrate and Dr. Rygate. He found the bones about twenty feet from the entrance. He first saw the thigh bone, then the shin, and subsequently the skull. He had been accompanied by a man named Dow, and on a previous occasion tried to explore the cave; but having no light, they had to return. He reported the matter to Constable Healey, at whose request he and Dow again entered and found the smaller bones and portions of bottles, and the rotten remains of twigs, which might have been as a bed. Only small men could get in, and they only with difficulty.

Dr. Rygate said the remains were those of a man of about 60 years of age, about five feet nine or ten in height, the head had a peculiar formation, being very large and narrow. Deceased must have been dead many years.

Sydney England, a selector of Blathery Creek (who had not had heard Dr. Rygate's evidence) said he had been 33 years in the district, and had been overseer of Narrigal station about 15 years ago, when Mr. Manwell was proprietor. He recollected the disappearance, about that time, of a hutkeeper named William Martin. He was a man of about 50 or 60 years of age, rather decrepid [sic], of light build, and had a long narrow face and high forehead. He believed the skull produced corresponded with Martin's head, though he would not swear it was. Martin was a hutkeeper for a shepherd named Lynch, with whom he lived two years. They were on good terms. Reported the disappearance to Mr. Manwell, who said "Oh, he'll soon return: I owe him £14 for wages." Martin never did return to claim his wages, and witness never heard of him again. He had been drinking for two or three days before his disappearance.

Sergeant Chiplin stated that he, with constable Hayes, had explored the cave, but with great difficulty. they took candles down, but could not keep them burning, and could make as careful search. The cave is entered by a narrow passage almost perpendicular for ten feet, and an angle of 45 degrees for the next 15 feet, when the cave commences about 12 feet wide. The passage in is only just wide enough for one man, and at one spot only large enough for a small man. The cave continues to open out until it is about 25 feet, wide, but the floor still sloping downward till it reaches water. A considerable portion of the roof and sides were covered with stalactites. The sides were and shiny and broke easily, as if recently under water. There was a bed of nearly white sand near the water, and towards the roof an aperture like the entrance to another cave. There was a draught of air as if there was some second inlet from the open air.

The Police Magistrate gave it as his opinion that the remains were those of William Martin who disappeared about the year 1867, but there was no evidence to show as to the cause of death.

Sergt Chiplin intends to give the cave a searching examination, but so far as the human remains are concerned, little more will be gained. It is most probable that Martin discovered the cave and used it as a living place while drinking or a place of deposit for his money. It is very improbable that he met his death by violent means. The rotten twigs indicate that he made it a resting place, the bottles that he indulged in drinking strong liquor, as there must have been water there ; and the fact of his having been drinking for two or three days, probably induced him to avoid his employer, and while in the cave he either got drowned, or died from the effects of foul air. There is reason to believe there are other caves in the neighbourhood, and as those in Wellington are so fertile in remains of scientific value, it is to be hoped Mr. Ramsay, the Curator, will extend his operations to Narrigal ; though it will be well to warn him that unless he and his hench-man Sibley, undergo a training process, and so get rid of their superfluous flesh; there may be some danger if either tries to enter this Narrigal cave, that one or other will find himself converted into a "stopper".

One of the witnesses stated that there were large quantities of animal bones ???[unreadable]??? &c.

WELLINGTON. (1882, March 1). Bathurst Free Press and Mining Journal (New South Wales 1851-1904),

Amazing cave discovery

Experts fear plundering of fossil site

Two newspaper articles about Bakers Swamp (I couldn't resist the one on the left—the photo of our President reminds me of how he was when I first met him some 31 years ago ... Editor)

Acknowledgements: Thanks to Ian Curtis for the 4 August trip report and the details from which the potted history was compiled; to Bruce Howlett for the Bathurst Free Press article; to Denis Marsh for comments and copies of newsletters; to Gareth Thomas for photographs.

Entrance to Niah Cave with bird nesting poles hanging from ceiling and hut (Steve Bourne)

Decorations in Clearwater Cave

(Garry K. Smith)