

Journal of the

Australasian Cave and Karst Management Association



The ACKMA Journal

Official Publication of the Australasian Cave and Karst Management Association Incorporated.

Published quarterly in March, June, September and December.

The opinions expressed in the ACKMA Journal are those of the individual authors and not necessarily those of ACKMA Inc or its officers.

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Photos taken by the authors or editor unless otherwise acknowledged.

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FRONT COVER: Garry's version of Robbie Shone's Deer Cave shot (see page 15). Photo: Garry K. Smith

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POSITION VACANT — May 2020??

Journal Editor (unpaid)

EDITORIAL

In my editorial in the December 2019 Journal, I noted that, 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 had come, both of us being gentlemen of mature years, for us to step down at the next ACKMA Annual General Meeting – hence the job advertisement banner on this page. Then, it will be time to pass the baton to another generation.

I had intended that this definitely be my final Journal—it was also to be the final print-run copy—the Narracoorte AGM having resolved that future Journals were to be electronic only. Covid-19 has intervened, however!

Reluctantly, I have agreed to continue until a transition is possible (or the Wellington AGM in 2021, whichever comes first) - I hope the former!

This edition, coloured as it is by the disastrous fires that have impacted so heavily on karst areas, is headlined by the summary collected by Andy and Cathie Plowman of those impacts.

However, as Andy notes in his President's report, virtually all cave sites have been closed by the pandemic—even if they had not needed to close for a period to deal with bushfire damage.

This edition also contains the second instalment from Steve Bourne on his return to Mulu (and, in addition, an interesting invitation from John Brush—still current), they being two authors who have made my life significantly easier over the past two years by their willingness to provide interesting copy.

For this edition, I have personally contributed a piece concerning the fascinating ancient cave art (replica) sites I had the pleasure to visit in France in January of this year. That visit also encompassed a visit to L'Aven d'Orgnac, a cave site which enabled my 15 year old son who accompanied me to undertake an interesting adventure caving activity, thus providing a basis for a further short piece in this journal.

Understandably, the "Around the show cave" section has "dried up" for this edition for obvious reasons—I hope that there will be much positive to tell in future editions.

Stay well and safe.

Tim Moore

JOURNAL BACK COPIES

If you would like to receive any of the back copies listed below, email my Associate, Ms [Peta Dixon](mailto:peta.dixon@courts.nsw.gov.au), at peta.dixon@courts.nsw.gov.au

We will post them to you. There are no costs associated with this offer.

Whatever back copies remain as at 31 July will be recycled. This offer will be repeated in the June Journal with an updated list.

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	Nil
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 March 2020

What an amazing, and dreadful, summer! Fires across our precious karst areas – our busiest tourism season interrupted (= destroyed) at Jenolan, Wombeyan, Yarrangobilly, Buchan and Kelly Hill – but not to a great extent at Yanchep, I believe. Many of NSW's most significant karst areas were within fire perimeters. And then followed by extensive heavy rains causing more damage along the Eastern Seaboard karsts.

A group of ASF, ACKMA members and academics have prepared a survey proforma to help us assess what has happened to our karsts. If you are in a situation where you can assess fire impacts, I urge you to use the proforma and help us build on our knowledge of what has happened. More elsewhere in this Journal.

Jenolan was closed by fire on 18 December, reopened on 1 February and closed by landslide risk after extreme rainfalls on the access roads on 7 February. A reopening date of 24 February occurred. Similar situations were elsewhere such as at Wombeyan and Yarrangobilly.

Buchan reopened on 14 February – not the caves – just picnic and some camping areas. The caves, walking tracks etc. are still being assessed for damage and safety reasons. But the ADF and troops from Papua New Guinea and Fiji have at least made the site accessible by rebuilding two bridges. Federal and Royal Caves scheduled to re-open as of 7 March.

Then along came Covid-19!

The cancellation of the upcoming Jenolan Conference became necessary – all the great work by Jodie, Scott and others now being for naught.

The Committee is now discussing the future of the 23rd Conference. In the meantime, our thoughts and thanks must be with Jodie, Scott and their colleagues who worked so hard developing the Conference as well as coping with fire and flood and not pestilence! .

We now know that virtually all (if not all) cave sites in Australia and New Zealand are closed – it is going to be a hard year for us all.

For a few years I have been trying to track down the situation regarding one of our early Life Members - Alan Costigan who managed Buchan for some years – without success. Sadly, I found out a month or so ago that Alan has passed on to speleothem heaven. More elsewhere in this Journal.

As indicated, repeatedly, both Tim – our Editor – and I will not be standing again in our current positions. So put your hands up and help to help ACKMA develop (although Tim has agreed to stay on for a while given these dark Covid-19 times, he wishes—as he says in his editorial—to relinquish the role as soon as possible and, certainly, at no later than the 2021 AGM).

Andy Spate

The 2019-20 bushfires and karst across Australia

Andy Spate and Cathie Plowman

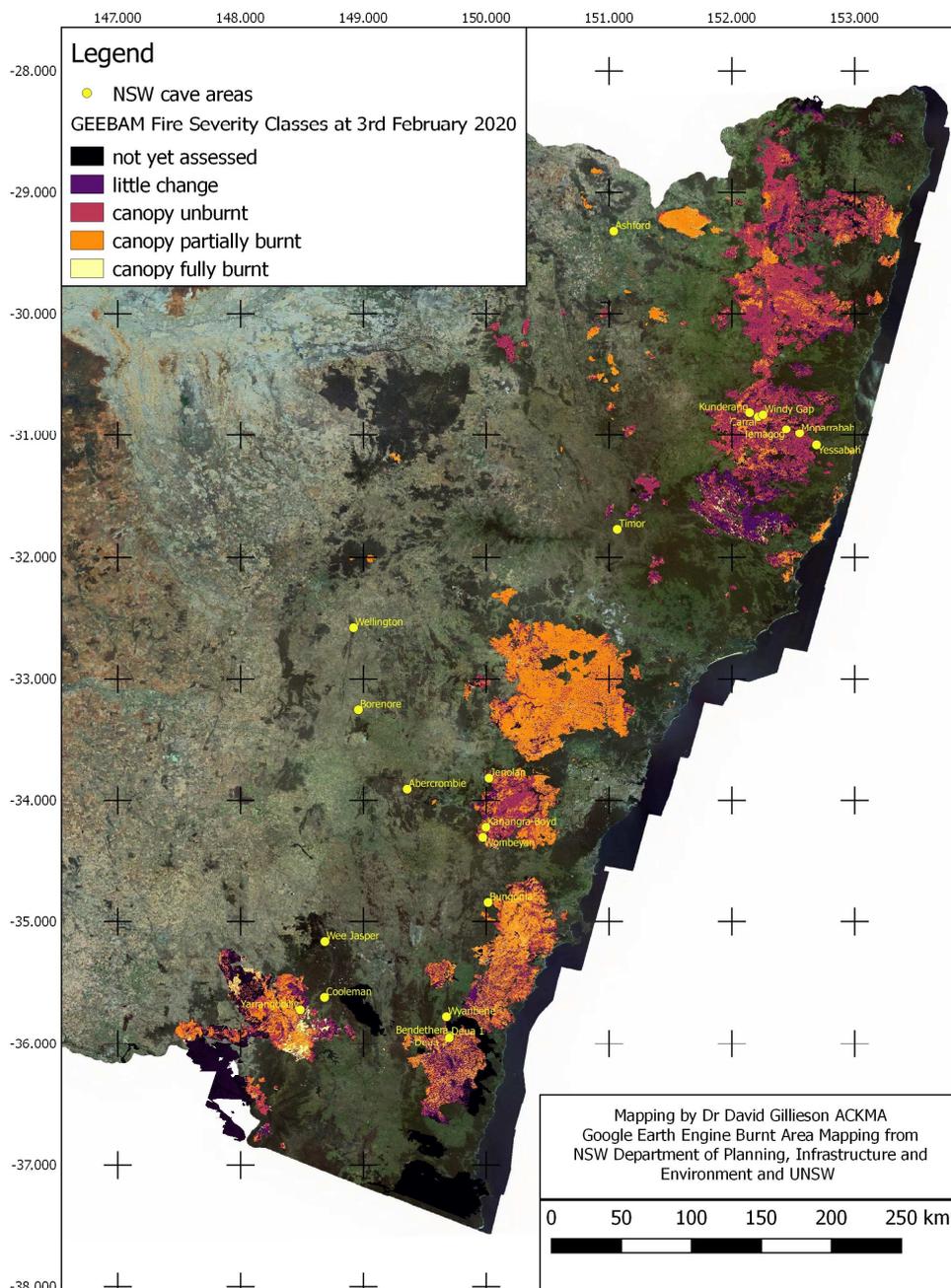
Some 13-16 million hectares have burnt across Australia since before July 2019. This figure excludes burning in the tropical savannahs – it is an area more than two times the size of Tasmania. In NSW fires burnt from July 2019 until early March 2020. To use a word, much overused this summer, this is unprecedented.

The damage is massive, and we will probably never know the full extent of the damage on karst processes and cave ecosystems due to minimal to nil baseline information in most places.

Besides their own close connections to the caves concerned, ASF and ACKMA members have close connections to the staff who manage the caves, guide tours and often have given decades of service and love to the reserves and other karst areas.

We know that this is a difficult time for all concerned and wish you strength.

Here's a summary of information from emails received over recent weeks and examination of fire maps plus phone conversations as at 7 March. However, the fire perimeters indicate just perimeters – in many areas the fires will burn patchily within those areas as can be seen from Dave Gillieson's map (below). It will be some time before we fully understand what has happened across southern Australia.



NEW SOUTH WALES

Jenolan

Jenolan was closed by fire on 18 December and reopened on 1 February only to be closed as a result of severe flooding with consequent severe sediments loads of silt, sand, gravel. It reopened on 23 February but with access only via the Two-mile Road (the Oberon side). The Five-mile Road is still closed owing to concerns about the stability of this road – essential for access by tour groups from the Sydney-side.

Miraculously the magnificent Jenolan Caves House was saved, with many of the local staff being part of the local fire brigade. The fire brigade building was burnt as was the cavers' cottage and two houses. The rare brush-tailed rock wallabies are being hand-fed in the caves area and via aerial food drops.



Fire on the ridge above Caves House, Jenolan (above)—Fire and Rescue NSW Station 411 Oberon Facebook Page

Yarrangobilly

If it was a miracle that Caves House at Jenolan was saved, it was an even bigger one that the historic Caves House at Yarrangobilly was spared. With a few well-prepared firefighters familiar with the precinct and additional sprinklers, the firefighters were ready to defend. A retreat to a cave was considered at one stage but not required. The area was burnt as recently as 2003 – in an area where a 50-60-year fire interval is expected. In addition, a hazard reduction burn eight months prior also reduced surrounding fuel loads. Yarrangobilly closed on 31 December and is expected to reopen for day visitors from Easter. The accommodation will reopen 1 July. Much, if not all, of the signage and outdoor interpretive material is gone. Access to the Thermal Pool is restricted indefinitely due to concerns about the stability of the road and the River Walk.



The former ticket office survived.
Photo: Bernadette Zanet



Recovery happening as regrowth occurs.
Photo: Jackie Perry

Wombeyan Caves

In the Caves Australia 211 article we stated, 'Significant damage to vegetation, but it seems that infrastructure has been saved.'

The actual situation is far worse. Wombeyan's woes started with heavy snowfalls last spring which brought down many trees, followed by the fires which burnt much of the reserve but little infrastructure. But the floods have inflicted major damage to the electrical systems in Figtree and Junction Caves, filled Figtree with vegetation debris and sediments such that the 'craybacks' at the entrance to Victoria Arch were covered. NPWS staff are working to clear up this debris. Much sediment – up to 50 cm – has been deposited in the sheds and workshops. Kangaroo mortalities have been high.

Elsewhere

Many other cave sites in NSW including Bungonia, Church Creek, Tuglow, some Deua NP areas, southern Kosciuszko NP, Hunter Valley, Macleay Valley and its hinterlands have, or may have been impacted. Plus, many, many other more remote areas. Coleman Plains has been impacted in part.

Virtually the only major areas not burnt are on the Western Slopes e.g. Abercrombie and Molong-Wellington.

QUEENSLAND

No information. Maybe Texas area?

SOUTH AUSTRALIA

Kelly Hill Caves, Kangaroo Island

Visitor Centre was lost – the toilets remain. Long-term caves manager Nick Heath lost his self-built home to the blazes while he was away firefighting. Not sure about Taylors Hill but karst in Flinders Chase NP has been burnt over. Research programs are being initiated here on karst processes and vegetation recovery.

Dave Gillieson tells us that the fires burnt most of the Flinders Chase park on the western end of the island but was patchy in the eastern half. Eastern boundary is close to Stunsail Boom River (which burnt a couple of years ago). West Bay Hollow, West Bay and the coastal karst up to Ravine des Casoars appear to be unburnt. CEGSA has plans to carry out detailed surveys in the Kelly Hill area to record karst features now exposed and assess vegetation recovery.

VICTORIA

Buchan and environs

Dale Calnin from Parks Victoria reported the Buchan Caves Reserve was directly impacted by the fire event on the evening of Monday 30 December and that the damage was significant and impact on reserve assets, huge.

Assets impacted include:

- Cabin 1 and Cabin 2 have been destroyed,
- Wilderness Retreats kitchen tent and three accommodation tents were destroyed as were the general assets within the retreat area,
- Two wooden bridges destroyed, the one between Spring Creek picnic area and the Royal Cave carpark, and the other between the Guide Room and Fairy Cave carpark,
- The Guide Room and old workshop were destroyed,
- The Fairy Cave entrance structure will need to be rebuilt,
- Various light and power poles in the reserve have been damaged,
- All walking track assets severely impacted, and
- The power beyond the visitor centre will remain off until further recovery works are completed.

The reopening of the Buchan Caves Reserve remains an extremely high priority for Parks Victoria. But further things happened.

Military personnel from Papua-New Guinea and Fiji have rebuilt the two bridges. The caves closed on 30 December and Royal and Federal Caves was expected to reopen on 7 March. Fairy Cave might take some time. Some picnic areas and some camping facilities have reopened.



Buchan Team Leader Hamish Hancock thanking the ADF members

Nicholas White from the VSA reports that fire burnt up to the Rimstone Cooperative accommodation Homeleigh fence, but the Country Fire Authority controlled it.

Rimstone also have some private cave reserves and the Scrubby Creek Cave property has been severely burnt. It is expected that boundary fences have been burnt but the condition of the new fencing around the Tufa Terraces is unclear. The Shades of Death property not touched.

The Potholes Reserve was severely burnt as were several private cave properties.

Nicholas assures us that the Nowa Nowa bat maternity cave in the Colquhoun Forest South of the Bruthen-Nowa Nowa Road was not burnt.

Many of the smaller east Victorian karst areas such as Limestone Creek, the Basin, Jacksons Crossing and New Guinea Ridge have almost certainly been burnt over.

WESTERN AUSTRALIA

Yanchep National Park

The reserve has been significantly burnt, but apparently no infrastructure lost. Research going on here.

Elsewhere?

Fire on the Nullarbor burnt over karst. There was fire around Balladonia. But no map or other information available.

RESPONSES

Some research scientists and ASF and ACKMA people have met via teleconference and many emails to discuss future research, monitoring and funding applications to follow up on the fires. Additionally, they have developed a proforma for cavers to report on fire impacts. Nicholas White has circulated some information regarding this. More to come on this but both ASF and ACKMA email lists have circulated the proforma. We urge you to complete with what information you can.

DONATIONS

To donate, please use the preferred methods on the ASF Karst Conservation Fund Website at <http://tinyurl.com/rtshbyt>

If you wish to donate via the GoFundMe system BE AWARE of the tip at the beginning of their process and be careful to over-ride the tip before you complete your donation; otherwise, the tip will be automatically added to your donation and go here: <http://tinyurl.com/wbqdec2>

All donations over \$2 are tax deductible and will receive a receipt from the KCF if required.

An earlier version of this article appeared in *Caves Australia* 211. We thank ASF for permission to build on the original article.



Driving into Jenolan to fight the fires.

Photo: Western Advocate

Steve Bourne's visit to Mulu – continued from the December 2019 Journal:

Camp 5 was at capacity that night with around 50 visitors. There was a very noisy group next door who kept chattering until late in the evening when I lost patience and thumped the wall - maybe a bit too hard, as I think I woke anyone who had managed to get to sleep! It also rained heavily overnight (which I thought might put the following day's climb at risk) but all the other visitors had all left by the time we were up.

After the obligatory noodle breakfast, we departed around 7.20 am to walk the nine kilometres to the boat pick-up point. It seemed to drag on, but we all reached there by 9.30 am. Pleasingly, the overnight rain had lifted the river and it took just an hour to reach Park HQ without needing to get out and push the boat. The afternoon was spent regaling Hein and Andia with stories, downloading photos, cleaning gear, eating, drinking and recharging for the following day. On a Mulu trip, you need to allow some time for the body to recharge, as the heat and humidity can really take a toll.

The trip had been planned to build up to the Pinnacles and take it easy for a couple of days before the Sarawak Chamber trip. So we had a couple of easy days ahead.

That didn't mean I would let Steve Group sleep in; we were at the Park HQ to meet our guide, Lawai, at 8.30 am for the Canopy Skywalk. The Skywalk is about a 1.5 kilometre walk along the Deer Cave boardwalk. It is an approximately 480-metre long suspended walkway, around 30 metres off the ground. It is a great way to view the forest. Our expert guide, Lawai, pointed out insects, birds and mammals that we would otherwise have missed. We saw pygmy squirrels here and also later at the resort. Carey, John, Melissa and I did the Botanic Walk on the way back to Park HQ and the others went with Lawai to find pitcher plants. The Botanic Walk was created by Brian and Sue Clark during their tenure at Mulu. It has a huge amount of information and is probably under-utilised by park visitors. We discussed whether the name of the walk may not inspire visitors to take it. However, the Botanic Walk should be included in a trip to Mulu.



Denis on the Canopy Boardwalk. Garry K. Smith

A familiar face was at the Park HQ at lunch time. Andy Eavis was at Mulu for a few days during our stay, working with a group from Singapore who have an ambitious project to build replicas of some Mulu cave chambers as a tourist attraction. For those of us who know Andy, it was great to catch up for a chat. I had a big smile on my face introducing Carey to Andy, as they have so many friends in common with strong links to Mulu.

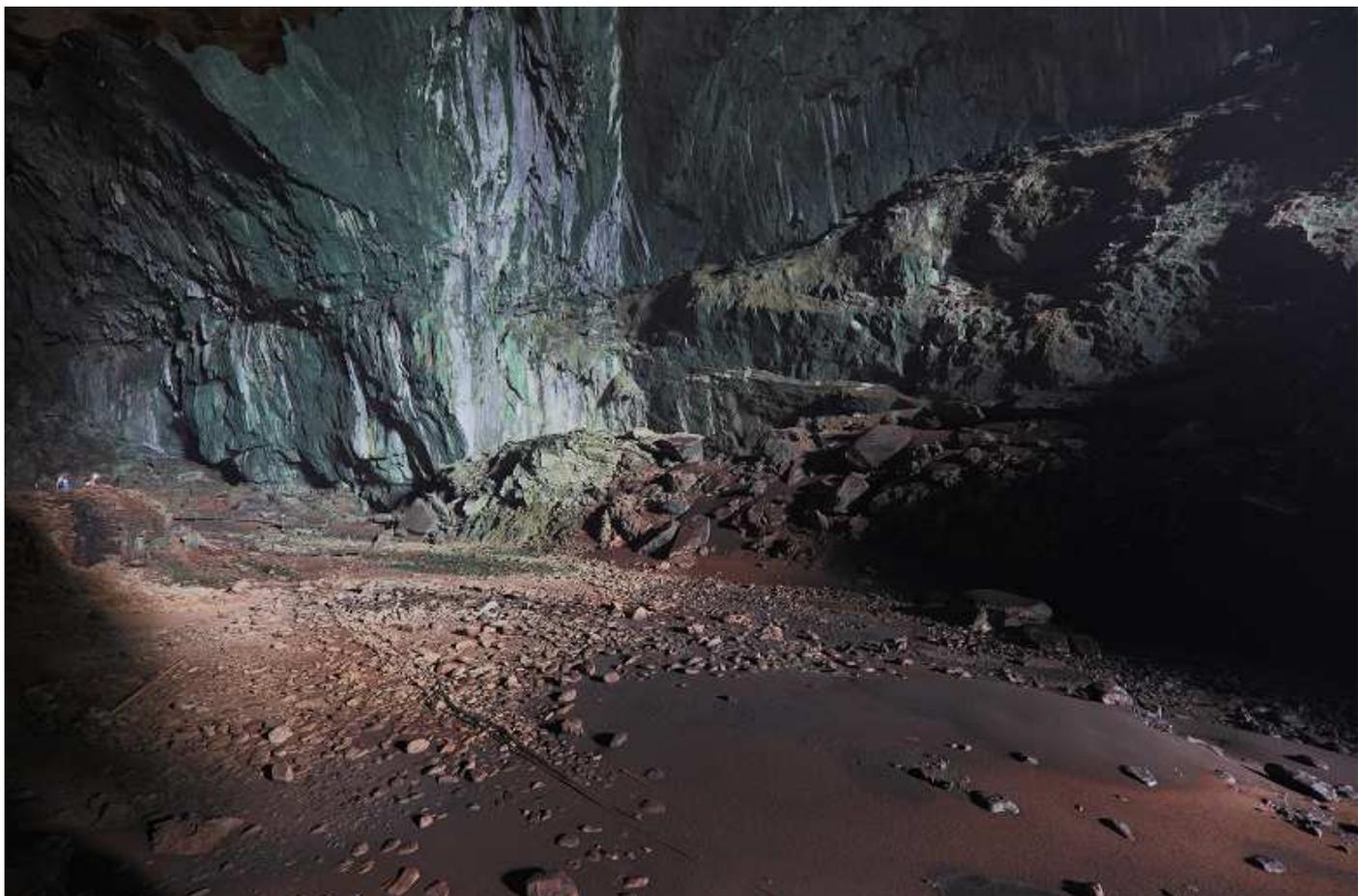
After lunch it was off to Deer Cave - along the four kilometre boardwalk again. Deer Cave tours are all run in the afternoon so visitors can collect in the viewing area after the tour to watch the bat exodus. The Park Café features a great photo of Deer Cave by Robbie Shone, one of the world's best cave photographers. Check out his social media and website (www.shonephotography.com/adventure-cave-travel-photography-bio). I follow his exploits and photography and he produces some amazing images. Garry was keen to have a go at a similar image and I had my 12-millimetre lens that I was keen to use for some wide-angle images of the cave.

The photographers (ie everyone) in Steve Group were busy taking photos, with Garry setting up for his shot with his multiple flashes. We had a short window to take this photo before other visitors reached the cave and we had to get back on the boardwalk and path. We achieved some nice results (see photo on next page).

For me, Deer Cave is one of the truly great caves in the world. It has an awe-inspiring entrance, a massive passage and is absolutely teeming with wildlife. There are an estimated three million Wrinkle-Lipped Bats in the cave, with another 11 species also found in there - the most diverse of any cave to my knowledge. The guano produced by so many bats is a food source that has its own ecosystem of invertebrates. The streams have a healthy population of catfish, shrimp and crabs. The view from the rear of the cave into the Garden of Eden is sublime, with great showerheads dropping water tens of metres from the ceiling to the floor. Words don't do the cave justice, so enjoy the photos!

After an easy day, it was time to step it up again, with two caves planned - Fruit Bat and Kenyalang. In my multiple trips to Mulu, I hadn't seen these caves so was extra excited about the day ahead. These caves are both in a small ridge of limestone that extends from Deer Cave - so along the boardwalk again to Deer Cave, turning off before the viewing area.

Fruit Bat Cave entrance is about 30 metres up from the forest floor. The cave is small by Mulu standards, with lots of bell holes in the ceiling and most housing small bats. There was some reasonable decoration but much of it corroded by guano.



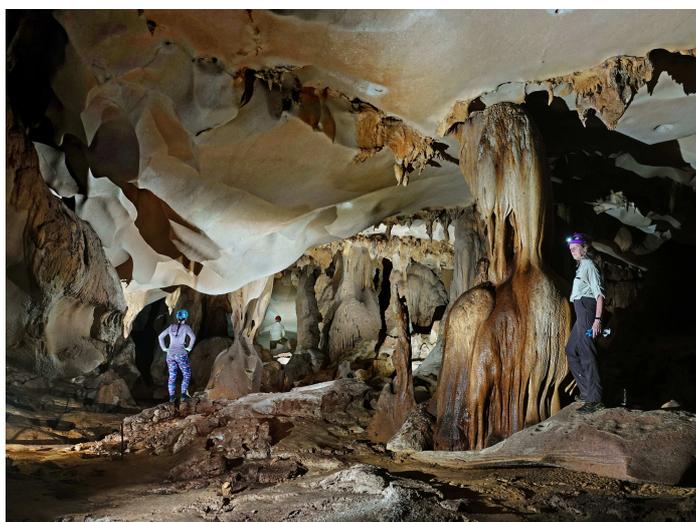
A view of Deer Cave, note our group on the boardwalk in left on the image and if you look very closely, you can make out Carey further along the boardwalk. Photo: Steve Bourne

The cave had the odd Hairy Mary or Cave Centipede *Thereuopoda longicornis* (formerly *Scutigera decipiens*). They are interesting to photograph as they move so quickly, but some good shots were achieved.



Hairy Mary, or Cave Centipede *Thereuopoda longicornis*
Photo: Garry K. Smith

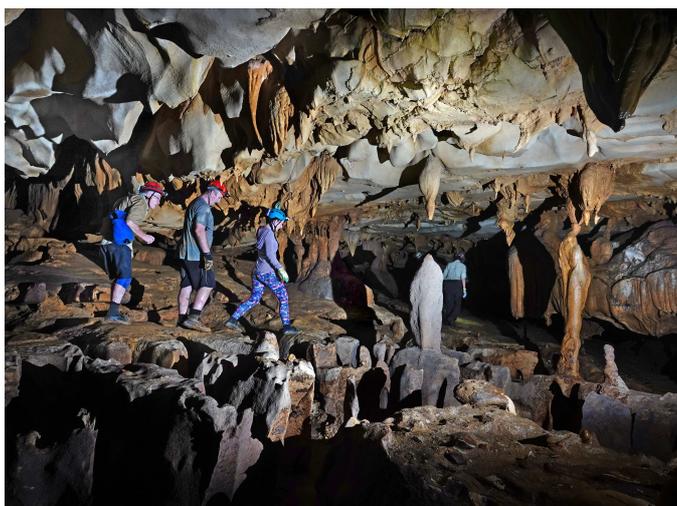
We walked through to the cave exit, disturbing some fruit bats that give the cave its name. I was keen to photograph bats, especially the fruit bats and had my telephoto lens on my camera. A lapse in concentration on the very slippery floor and I was down, catching my arm on a sharp, eroded stalagmite. I angrily left the cave with Lawai to wash and bandage my arm while the others took a few photos.



Carey, Melissa and Julian in Fruit Bat Cave. Photo: Garry K. Smith

Kenyalang Cave entrance is lower than that of Fruit Bat Cave, at about 10 metres above the forest floor, and is essentially a lower level passage under Fruit Bat. This cave would make a great children's adventure tour: a crawl-in entrance followed by a small traverse and a fixed handline, with the cave doing a loop around back to the entrance; lots of cave critters again; pools of water; and interesting water-sculpted floor and ceiling. These two caves are on a walk that is a shortcut from the resort to Deer Cave that crosses private land. Apparently there is some dispute about visitors using this path so the bridge has been closed and we had to walk back to Park HQ to catch the bus to the resort.

It was amusing to see the look on other visitors' faces as they walked to Deer Cave, seeing us filthy with mud, sweating, scratches and my bandaged arm. They must have wondered what they were in for!



John, Steve, Melissa and Carey in Kenyelang Cave. Photo: Garry K. Smith

That evening we dined with Hein and Andia at their place, with a delightful meal of Sambar Deer and solved most of the problems of the world. Rice wine is good for that. Another day, another cave - this time Stone Horse Cave, so named for the shape of a stone in the entrance that looks like - a horse! It is reached along the now all-too-familiar Deer Cave boardwalk.

I had been in this cave a couple of times before, clambering up the steep slope over 50 metres to reach the entrance. Brian Clark built a staircase to the cave which is now offered as one of the Park's adventure tours. It was Garry's turn to injure himself, with the floor giving way and the front of his leg being quite nastily scraped. Thankfully, I had iodine swabs with which he cleaned his wounds, causing much pain but most necessary to reduce the chance of infection. The cave has some fixed handlines upon the state of which Hein had asked us to report back. These were probably the poorest condition ropes we had used, but still quite safe. There were some quite large drop-offs and some areas we had to traverse, so care is required.



Steve Group traversing in Stone Horse Cave. Photo: Garry K. Smith.

I imagine, for novice cavers, taking this tour would be quite an adrenaline rush. The floor throughout this cave is very soft and we later recommended to Hein that track marking through the cave be improved to define a route clearly. At the end of the cave, Lawai showed us a small passage that led to another cave, Fern Cave. We popped through for a quick look. This extends to higher passages, ultimately to an entrance at the top of the mountain.



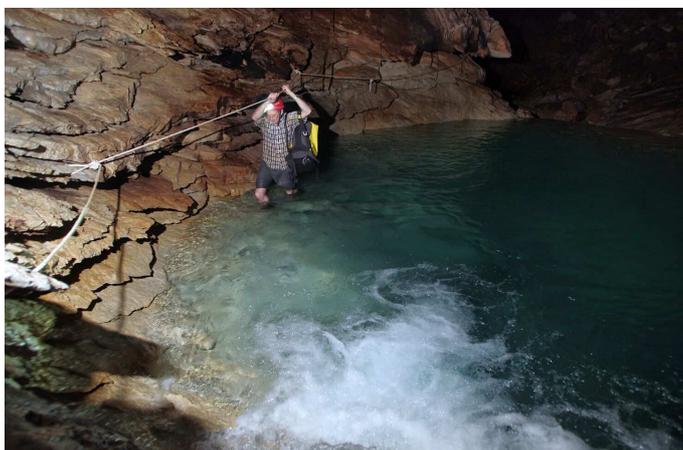
Steve bridging a deep chasm carefully. Photo: John Brush

Lawai cooked us dinner that evening, a generous gesture in return for the hospitality afforded him at ACKMA in Naracoorte. It was interesting to see the guide community, who live within the park, so actively playing badminton in the heat after a long, hot day at work.

The Mulu guides had planned quite an ambitious and strenuous itinerary for the following three days. It looked just a bit too much so we refined it so we would spend one night, rather than two, away from Park HQ.

We set off just after 10.00 am, planning to visit Drunken Forest Cave one day and Sarawak Chamber (accessed via Goodluck Cave) the next. It was a mistake leaving so late, so we changed plans en route to visit Sarawak Chamber first (which is a much longer trip). There was a risk of rain and, if this occurred, we may not have been able to visit the cave and Sarawak was the 'must do' on everyone's list (I had managed a visit in 2010 during the ACKMA event). We didn't want to risk missing out. Once again, it was around a 9-to-10 kilometre walk to the cave (this seemed to be the standard length walk). Along the way, we sampled Durian fruit, a delicacy that is pungent to say the least. I like it, as did some others, but it isn't a taste or smell that everyone enjoys. We didn't reach the entrance to Goodluck Cave (Gua Nasib Bagus) until about 1.30 pm where we offloaded camping gear and food we didn't need inside the cave.

Goodluck Cave is a beautiful stream passage with clear water, small waterfalls and pools. I think it was everyone's favourite part of the entire trip. Once again, there were well-placed handlines to assist skirting rockpools, although I generally enjoyed just wading through them or swimming. The handlines would be necessary if the water level was high.



Garry traversing a pool. Photo: John Brush

The streamway is over 800 metres long before reaching the beginning of Sarawak Chamber and starting the climb up ... and up. The floor is broken rock and much care is needed to not set rocks tumbling down the slope onto those following behind. We reached a point partway up the chamber and looked around, mostly at darkness, but being able to make out some rockpiles. Even with the Scurion headlights and the 4,000 and 6,000 lumen Nitecore torches we had, we could only see limited parts of the chamber. It is quite disorienting and I am sure many have read the story about the discovery, where Andy Eavis and two fellow cavers couldn't determine whether they were in a long, wide passage or a monster chamber. Now we know it was the latter. We took some interesting photos and videos of water streaming out of the ceiling before making our way out of the cave. We set up a few photos at rockpools and waterfalls, with me offering to be the model in the water where it was cool.

I was wading out of the cave with no more than 10 metres to go when I hit my shin on a submerged rock. The wound didn't heal properly for two months.



Steve and Julian under a shower in Sarawak Chamber.
Photo: John Brush

Sarawak Chamber is offered as an adventure tour, with an age limit of 50 (as with the Pinnacles climb). Only one of our group would have been allowed on a regular tour! Experienced cavers in groups such as ours can obviously book the trip and gain exemption from the age rule, a limit that seems so low when you are on the other side of it. The regular tour stops at the entrance to the chamber, not that you can really tell where you are. Kenneth and Nick took Steve Group higher into the chamber and, with the map, we understood where we were and the cave shape. Going to Sarawak Chamber is a 'bucket list' cave. It is awesome to feel the immensity of the cave, but the Goodluck Cave stream passage is the real highlight. The tour was a single-day tour, which I did in 2010 after climbing the Pinnacles (must have been fitter then!), but is now a two-day trip with an overnight stay in Camp 1. This is sensible as nearly 20 kilometres of jungle-walking, plus the cave, is a big day.

By now, it was after 6.00 pm and we still had four kilometres to walk to Camp 1. To add to the fun, there was thunder and lightning and light rain started to fall. The route is not straight and John had the location plotted in his GPS. It didn't help when we realised we'd walked for 30 minutes and not actually got any closer to the destination! The last kilometre was a real test of willpower, up a slope that seemed to get steeper as we went. We made it before 8.00 pm and I am pretty sure everyone had had enough for one day. The river was close allowing for a wash. We had been wet for most of the day; a mixture of sweat, cave water and rain. Camp 1 is very basic - just a wooden hut with some thin mattresses (for those who didn't carry their own) and a gas stove for which you need to bring canisters. Noodles for dinner and then everyone collapsed to sleep.



The "luxurious" Camp 1. Photo: John Brush

The following morning, I was admiring the view of a mountain that was almost devoid of vegetation. Kenneth informed us it was hit by lightning a few years ago and it burnt, the first time anyone knew of such a happening. There has since been a second fire. This is a serious concern if rainforest at Mulu is becoming dry enough to burn.

I asked Kenneth if he had been to the top of this mountain. He said that he had and added, in a matter of fact way, 'there is a big cave up there they haven't found yet.' He then said it is too dangerous to climb now as, without vegetation holding the limestone blocks together, large boulders are routinely falling off, crashing to the river below.

We set off early for Drunken Forest Cave, down the hill that was so steep the night before, a gentle walk down a slight decline. It was around a four kilometre walk to the cave entrance along a very poorly defined trail, reflecting the low number of visitors to the cave. The entrance, about 30 metres above the valley floor, is small - a squeeze by Mulu standards - and then a couple of small passages and climb down before opening up to a larger passage.



Steve admiring oolites in Drunken Forest Cave. Photo: John Brush

This cave is nicely decorated - setting Garry into full picture-taking mode. The large clusters of leaning stalagmites that give the cave its name are fascinating and very photogenic. The leaning stalagmites are as a result of subsidence in the floor caused by water flows through the cave and compaction of sediments. Either the flood levels have been extremely high in the past or water has entered through the cave from a higher point. We didn't have enough time to investigate and answer questions like this. We only spent around three hours in the cave when it could have been a much longer trip with many more photos. I think we were all thinking about the nine kilometre hike back to Park HQ.

The rain had brought more leeches out. This, combined with the temperature and humidity, made for an uncomfortable walk home. There was a moment of humour though. Julian's shorts had finally failed and Andia had given him a pair from one of her sons. It would seem that, on their last wash, an amount of detergent was not rinsed out and, as Julian walked and

sweated, foam was produced, unbeknownst to him. When he reached the boardwalk for the final stretch to Park HQ, he realised something was going on when a visitor looked at him in horror. Julian had this white foam extending from his groin down to his ankles, looking like some spawning bullfrog. Probably one of the highlights of the trip!



Chamber view - Drunken Forest Cave. Photo: Garry K. Smith

After the basic amenities of Camp 1, it was back to the luxury of a swim in the Marriott Resort pool; warm shower; and Tiger beers - before enjoying a tasty meal at one of the small restaurants across the river from the resort.

The next day was Lagangs Cave, part show cave and part adventure. If you visit Mulu with limited time (which you shouldn't), Lagangs must be part of itinerary. We stopped off at the village to pick up Carey's wood carving of a fruit bat. The price had not been negotiated prior to the carving being completed and the size Carey requested seemed to have been lost in translation. It was a very nice piece but weighed several kilos and the starting price was MYR1800. This was negotiated down to MYR400. It was a lovely carving but very heavy wood. Carey had second thoughts about trying to take this through Australian quarantine, so she sold it to Julian, who had no such issues with UK customs.



Carey and carved fruit bat. Photo: Garry K. Smith

Julian's feet had finally given up with blisters peeled down to raw flesh, so he left the cave after the showcave section. We continued off the constructed path through to where the cave exits the other side of the mountain, a couple of hours walking/caving. Kenneth showed us different kinds of swifts' nests; explaining how different colours have different value. Although he had collected many and it was once his source of income, he hadn't ever tasted the resultant soup. I have and I don't know why anyone thinks it is worth a lot of money. The full length of the cave has bats and swifts, together with plenty of speleothems. Lower levels have interesting sculpted ceilings, formed by floodwater pushing sediment against the cave roof.



The rear passage of Lagangs Cave (with Garry and Melissa).
Photo: John Brush

We met the show cave path in a section called Fast Lane. A recorder adjacent to the path showed a temperature of 24.8°C and humidity of 99% - no wonder we were sweating.

Our original itinerary included a through-trip of Lagangs, continuing on through the forest to Camp 1 to visit Sarawak Chamber and Drunken Forest Cave, with one night at Camp 1 and one sleeping in the jungle. It would be a great trip, but not one for a time near the end of a trip after lots of caves and jungle-walking.

On our last day in the park, Garry, John and I did some PowerPoint presentations for the staff. On each trip I have done this, the guides really enjoyed learning about other caves. We were to meet at 8.30 am at Park HQ and, unfortunately, Denis missed the deadline and bus - sorry Denis! Garry spoke about Australian caves, John on lava caves and my presentation was about my Hang Son Doong trip in Vietnam in 2018. It seems that visitors know the discussion about the biggest caves in the world and the guides get asked which is the 'better' cave - Song Doong or Deer Cave or Sarawak Chamber. My answer was none of them, as each cave has its own character and values and is presented in different ways, but all are certainly amazing.

A brief comparison on visitor experiences to Son Doong and Sarawak Chamber. Song Doong is a four day, three-night trip. All food is provided and cooked on the trip. Porters carry everything for you including camping gear (supplied), toilets are set up in the cave, and fresh water is provided each day. A banquet dinner is provided at the conclusion of the tour and each visitor is given a medal for "conquering Son Doong". Visitors are strongly encouraged (pressured) to provide a large tip for porters. Sarawak Chamber is a two day, one-night trip. You carry all your food, water and camping gear yourself (a mattress is available at Camp 1 but I recommend that you take your own). At the end of the trip, you sit with the guides and buy a drink or two as a thank-you. Song Doong costs \$4,000, Sarawak Chamber \$150.



Melissa under a flowstone canopy. Photo: Garry K. Smith

After the talks, we took long boats down the Sungai Melinau Paku River to the junction with the main river, Sungai Tutoh, and then up the main river to a local village, Long Iman. The boat ride took around 45 minutes. Long Iman has lots of local handicrafts for sale and a few items were purchased. Melissa, in particular, needed a little retail therapy and purchased quite a few souvenirs for family and friends. We then travelled another 10 minutes or so upstream to a small stream named Long Lesat. We enjoyed a swim and a snack - welcome relaxation after so much activity over the previous two weeks. The last afternoon was pretty hectic - paying bills at the park and cramming in a few drinks and eats at all the places we had discovered during our stay.



In the long boat – we travelled over 60km using these.
Photo: Garry K. Smith

We left the next morning, all flying from Mulu to Kuching and from there we split off to our various flights back to Australia. John and Garry collated their notes on our trip and some data from John's GPS. We walked 103 kilometres in the jungles of Sarawak; visited 14 caves; walked more than 20 kilometres underground; spent 38 hours underground; took 12 long boat trips covering 60 kilometres; and 25 rides in the Marriott Resort shuttle bus (truck) to and from the resort to Park HQ. The exchange rate was approximately MYR3 to A\$1.

The Marriott Resort provided a high level of comfort and, with the twin-share rooms (except for Garry) and the negotiated rate, was quite affordable. Free transport is provided between Park HQ and the resort (and airport). A new supermarket has opened about 400 metres from the resort and has plenty of food available for days of camping out. It did seem to be under-utilised by park visitors as it doesn't have a good location. Evening meals at the Marriott Resort are not cheap but the buffet, at MYR88, was a good chance to replenish the body after a few days of two-minute noodles. Tiger beers at the Marriott were MYR32. Meals off-park are typically MYR12-MYR15 and Tiger beers MYR8. All of the tours, meals and drinks on-park and long boat trips came to about A\$800 each - excellent value I thought.

I hope that Steve Group may get together again one day for a further adventure - with interest shown in a Vietnam trip. We all got on very well and the feedback from all was great.

I have presented this as a chronological trip report so that it might be useful for others planning a trip to Mulu. I am sure any of the participants would be happy to provide advice, as would the very helpful staff at Mulu.

I recommend Mulu to anyone who hasn't been there and, if you have, maybe this will encourage another visit.

More Mulu photos



Above left — Julian, Denis, Carey and Steve sitting in front of Robbie Shone's Deer Cave image in the Park Café. Photo: John Brush

Left — Steve (in the water), John and Melissa at a rock pool. Photo: Garry K. Smith

Above right — Entrance to Kenyelang Cave. Photo: Garry K. Smith.



ANDYSEZ 59 - Thick stalagmites ... and thin ones - is there a conundrum?

Here is another Guest ANDYSEZ - this time from **Professor Andy Baker** from UNSW Sydney. Andy

B is very well-known figure in the world of cave and karst science. He and his colleagues are conducting research into karst processes at several sites in New South Wales and Western Australia.

Andy S will make some comments following Andy B's note.

Explaining girth ... of your stalagmites. Why are some stalagmites thicker than others?

Aerospace and cave research colleagues in Belgium and France have joined to recently publish a paper explaining all (Parmentier, J. et al, 2019). The title of the paper has the answer: 'A drop does not fall in a straight line: a rationale for the width of stalagmites'. Published in the Proceedings of the Royal Society, this is very technical fluid mechanics, so I will try to summarise.

First, the observation. You can have a stalactite with a drip source that never moves, yet the water lands at different places on the floor or a stalagmite surface. The authors use high-speed photography to show five drops coming from one stalactite but landing on different spots on the same stalagmite, up to 13.15 centimetres apart (Figure 1).

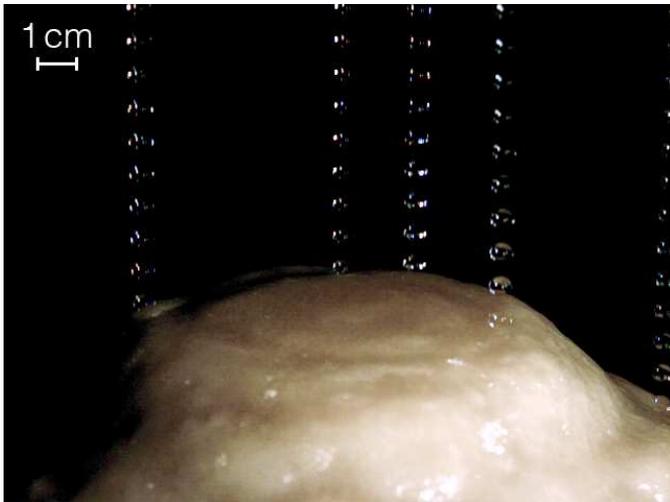


Figure 1. Distribution of drops across a stalagmite from a single source in Aven d'Orgnac, France. Image courtesy of Dr Justine Parmentier.

All water drops falling more than a few centimetres will have these chaotic vortices - pushing them, each time, a little bit more out of a vertical, straight line.

So, the further a drop falls, the longer the time it spends falling and the more opportunity for these random forces to push the drip from the vertical. The authors report impacts onto a stalagmite that are 13.15 centimetres apart. Maybe you will see something larger in your cave?

And the further a drop falls, the faster it will fall. And the faster it is on impact, the greater the amount of splash (Figure 2).

Why does this occur? It turns out that, as a water drop falls, its motion is quite complex. The authors report that vortices appear periodically in the downstream wake. These behave chaotically after just a few centimetres of falling.

If the water is saturated with calcite, then more splash means a wider area for stalagmite formation and a wider stalagmite.

The authors calculate the velocity of a drop for us. For a 10-centimetre distance from stalactite to stalagmite, the drop will have a velocity of about 1.5 metres per second at impact. At a one-metre drop distance, the velocity will have reached four metres per second at impact. And at 10 metres from the drip source, the velocity will be over eight metres per second. At even greater distances, the velocity doesn't get much faster, as the drop can't go any faster than the terminal velocity of around 10 metres per second.

So, there you have it. To explain the girth of your stalagmite, you just need to know the distance the drop has fallen. The further a drop falls, the more variable is its impact point. And the further a drop falls, the faster the velocity on impact, generating more splash.

Which means that, in your cave, if you have even a short way for drips to fall, the impact points would widen, and it would be impossible to form a minimum-diameter, candlestick-shaped stalagmite (this has been calculated to be three centimetres wide, Curl 1993). Which matches my observations. And probably those in your cave ... (and, if you do see a minimum-diameter stalagmite and you have a high ceiling overhead, it means the stalagmite formed closer to the ceiling, and one or both have moved since then).



Figure 2. High speed camera set up in the Aven d'Orgnac, France. Note the splash 'umbrella'. Image courtesy of Dr Justine Parmentier.

More from Andy S

Accompanying this ANDYSEZ is an image of 'Cleopatra's Needle' in Jersey Cave, Yarrangobilly. NPWS IT officer for scale - sorry you can't quite see the top of the classic 'candlestick' stalagmite (Figure 3).

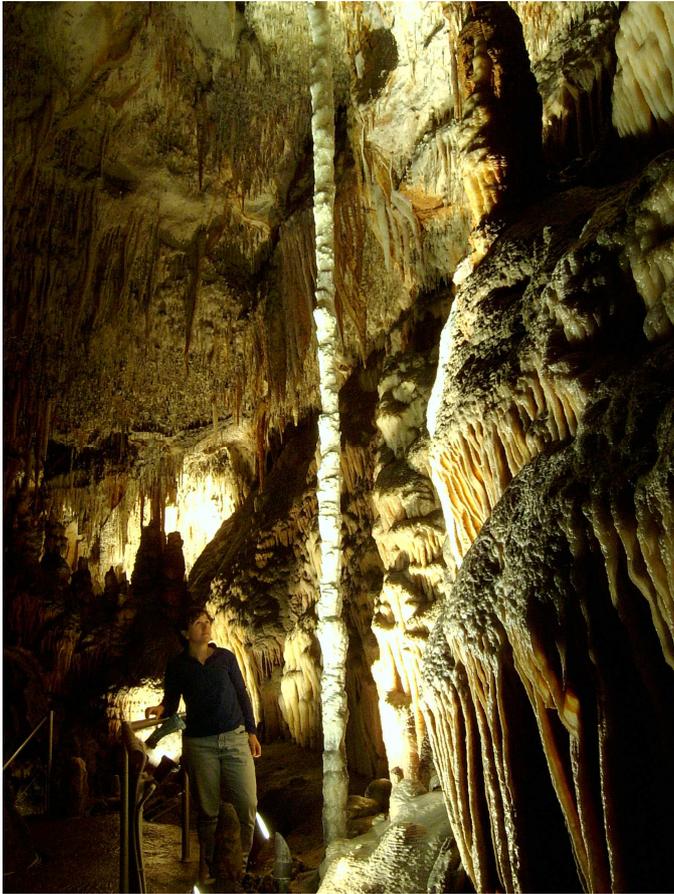


Figure 3. Cleopatra's Needle, Jersey Cave, Yarrangobilly, New South Wales. A tall constant diameter stalagmite. Andy Spate

Looking at Andy B's last comments, we have a six-metre-plus candlestick of virtually constant thickness. There is not enough time for a drop to reach terminal velocity, even when the stalagmite was small, but still enough height that drip deviation and splashing occurs, forming a wide candlestick stalagmite. This begs the question - can minimum-diameter stalagmites form?

The splashing distribution on thick, and often tall, stalagmites helps us to understand the often complex, small-scale structures that we often see around the base of such stalagmites.

Figure 4 shows some of these blades and similar structures around the base of a 10 to 15-metre-tall stalagmite - the roof was approximately 10-15 metres above. My only image of the whole of this stalagmite is too fuzzy to show - as is a closely related image of a dog lifting his leg on a small stalagmite - common in France and to a lesser extent in Italy.

But immediately adjacent to the big stalagmite - maybe no more than 10 m away - were these small, constant-diameter stalagmites - same roof height (Figure 5).



Figure 4. Blades around the base of a very tall stalagmite, Aven d'Orgnac, France. Andy Spate.

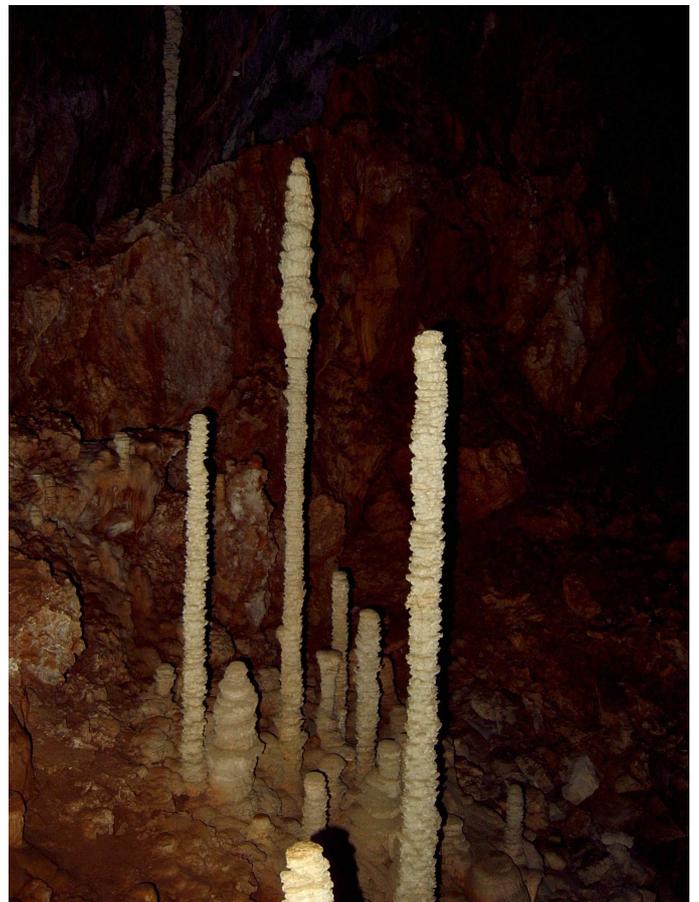


Figure 5. Constant diameter stalagmites adjacent to the very tall stalagmite in Figure 4. Andy Spate.

Similar narrow, relatively constant-diameter stalagmites, such as Cleopatra's Needle, but with different surface morphologies, occur frequently. This is the conundrum. Things, as usual, in caves are not simple. How do these constant-diameter stalagmites escape from findings of Parmentier et al? As they say, not all the answers lie in the field of fluid dynamics. Andy B and I postulate that drip rates may well play a role in producing constant-diameter stalagmites - intermittent dripping such that we might expect in many Australian caves (relative to the wet and massive Aven d'Orgnac) may help prevent stalagmite thickening.

There are many other factors which may play a role in producing both complex and constant-diameter stalagmites. The degree of saturation of the drip waters may well have an influence.

For a fine discussion of speleothem architecture, see Chapter 7 of Fairchild and Baker (2012). The book's diagrams and images are available online.

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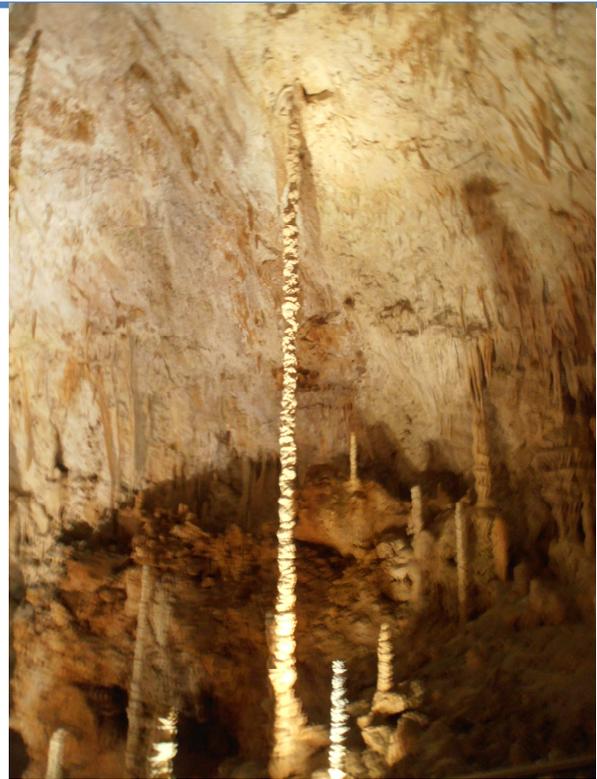
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Fairchild, Ian J. and Baker Andy, 2012, *Speleothem Science: From Process to Past Environments*, Wiley-Blackwell.

{Wonderful reference!!}

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{Andy B can send a pdf to anyone interested on request (please e-mail a.baker@unsw.edu.au).}



Column, Aven D'Orgnac: Tim Moore

Visits to ancient cave art sites in France

Tim Moore

For several decades, I have been fascinated by the story of the discovery of the Palaeolithic cave art at Lascaux and had promised myself that, should the opportunity arise, I would like to visit. This interest was compounded by the broadcasting on SBS of Herzog's documentary entitled the *Cave of Forgotten Dreams* about the Neolithic cave art discovered in the Chauvet Cave near Vallon-Pont d'Arc in the Ardèche Gorge. Indeed, several years later, my family and I went whitewater kayaking down the Ardèche River past the location of the Chauvet Cave.

As time went on, I read with interest of the intention to make an appreciation of the beauties of the Chauvet Cave available to the world in a fashion that preserved integrity of the cave itself – with this to be achieved by creation of an replica with associated interpretation and educational facilities. The complex for this, known as Chauvet 2, was opened in 2012. I mentally put Chauvet 2 and Lascaux on my “bucket list”.

A visit to France for December 2019/January 2020 to have Christmas with my eldest daughter and her family provided an opportunity for me to fulfil these desires. Study reasons for my youngest daughter's HSC in 2020 meant that she and her mother would leave me and my 15 year old son (who shares my interest in caves and caving) with 10 days in France to indulge my desire to visit Lascaux and Chauvet, amongst other locations.

With careful planning, although these two sites are some 600 kilometres apart (going “the long way” via

Carcassonne and Rennes-le-Chateau), I crafted an itinerary that permitted us to visit them both as well as tick off several other locations on my “bucket list” unrelated to caves (not to be dealt with in detail, but, for those interested in the “*Jesus' bloodline still exists in France*” conspiracy theory underlying Dan Brown's *The da Vinci Code* and its thematic basing on the conspiracy theories in the book *The Holy Blood and The Holy Grail*, a visit to the small hilltop village of Rennes-le-Chateau is fascinating).

As part of our cave related itinerary elements, I included a visit to L'Aven d'Orgnac (enabling me to contribute a photograph to the Andysez above and to interview my 15 year-old son for the purposes of the piece following this one about his adventure caving at this site).

To round off our cave related itinerary elements, I included visits to Grotte de Font-de-Gaume, a Neolithic cave art site near Lascaux, and to La Roque Saint-Christophe, in the Vezere River valley, used as a human habitation site from the Neolithic period to 1588. Grotte de Font-de-Gaume is described in this article and a short piece about La Roque Saint-Christophe will be published in the June journal.

Before commencing my description of the three sites we visited, there are some preliminary observations to be made. First, as a matter of practicality, photography is not permitted in any of them. While, for Chauvet and Lascaux, the reasons for this are practical (as flash photography would not damage the reproduction of the artwork, but would it significantly inhibit the visitor experience), at Grotte de Font-de-Gaume, it could damage the pigmentation of the art itself.

All three locations have images available on their websites. At each location, consent was given to reproduction of those images.

Second, in my preparation for the trip, I had read an article published in *The Guardian* in April 2015 savagely criticising the appropriateness of the visitor experience at Chauvet 2 because of its lack of authenticity and advocating that the only way to get an appreciation of Neolithic cave art was to visit a site where access was available to view the originals in situ. As will be obvious from what follows, I reject this proposition.

Both Chauvet 2 and Lascaux 4 provide not merely an opportunity to appreciate the beauty of the art itself (and the sophisticated skills that those creating it needed to employ) in a fashion that avoids damage to these precious World Heritage sites, but also the range of additional educational material provided in each complex (particularly the school group oriented educational materials and activities) means that these two facilities provide, in my view, extraordinarily valuable cultural and educational experiences.

That is not to say that my son and I did not find the opportunity to get within a few tens of centimetres of original Neolithic art in Grotte de Font-de-Gaume equally fascinating and an experience of a different but still enriching type.

It is appropriate to note, before embarking on a detailed description of either Chauvet 2 or Lascaux 4 that neither Chauvet Cave nor Lascaux Cave were habitation sites. Each of them appears to have been visited over quite long periods of time by the artists who have decorated the walls of each cave. This superb artwork is sufficiently deep in each of the caves that it must have been carried out using burning torches as no natural light reaches any of the artwork locations in either cave.

The second point that is to be made is that, in each instance, many elements of the artwork can only have been completed by more than one artist with two or more working in teams. This is evident from the fact that many of the artworks are at levels higher than could have been accessed by standing on the floor levels (as they were at the time of the painting).

A third point of relevance is that the artists took advantage of the leans and twists of the walls of each cave to import perspective and to convey elements of movement of the subject being depicted. Although there is some commonality of the animals depicted in each of the caves, there is a distinctly different emphasis in the number of animals of the various species that have been painted.

Finally, it is appropriate to note that, in each cave, the paintwork is not monochromatic but uses different crushed rocks of various oxides to obtain the colours (with smudging and shading also used to convey perspective and depth). Because none of the artwork used vegetable based materials, dating has had to rely on other artefacts such as animal bones.

Although the artwork at Lascaux Cave had been regarded as amongst the oldest cave art (being dated to approximately 20,000 BCE), dating of the artwork in Chauvet Cave now knows it to be from approximately 30,000 to 32,000 BCE – pushing back our cultural knowledge by some 10,000 thousand years or so.

It is, perhaps, trite to say it but the sophistication of the images in each of Chauvet Cave and Lascaux Cave coupled with the skills that were necessarily involved in their painting means that those ancient artists cannot be regarded as being unsophisticated primitives. To regard them so is to seriously underestimate and undervalue what had been achieved by them in each of these caves.

Finally, to round off this rambling introduction, although our visit to Lascaux 4 was fascinating, we had a minor twinge of disappointment that we were unable to visit Lascaux 2 – as it is only open in spring and summer for the major tourist visiting season each year.

Chauvet 2

Chauvet 2 is perched on a ridge line some 4 km to the east of Vallon-Pont d'Arc. There are, essentially, three educational aspects to the activities carried out on this site's campus. They are the reproduction of the Chauvet Cave; an educational facility dealing with the life of the Aurignacian people who had painted the decorations within the Chauvet Cave; and a series of workshop facilities within which various learning experiences pitched at an older primary or early secondary school student level that related to various aspects of the lives of the Aurignacian people.

My son and I visited the reproduction of Chauvet Cave; visited the displays about the lives of the Aurignacian people; and went in, for a short period of time, to one of the workshops being conducted for young French school students. The workshop was about the creation and use of fire in Neolithic society. It is appropriate that I describe a little of each of these activities.



The building housing the cave replica. Photo: Grotte Chauvet website

Visiting the Chauvet Cave replica site

We visited at the tail end of the winter (Christmas) French school holidays with an external temperature at or below zero during most of the day (without taking wind chill into account!). All visits through this facility are conducted in small pre-booked groups.

Our visit was on a Friday and the tour groups were pretty well booked out throughout the day, but primarily comprised adult participants. Booking is available online or at the site and, according to our guide, usually sells out weeks (and sometimes months) in advance in high season. We booked the afternoon before our tour the following morning.

The Aurignacian Gallery

Visiting this gallery commences with an audio-visual presentation which must be watched before accessing the display area. This comprises a series of dioramas with comprehensive multilingual explanatory material and display cases depicting cultural materials or faunal relics that have been discovered in the Chauvet Cave or in the local region (where these relate to the Aurignacian people). This facility was well presented and incorporated a comprehensive explanation of the various elements of the display.

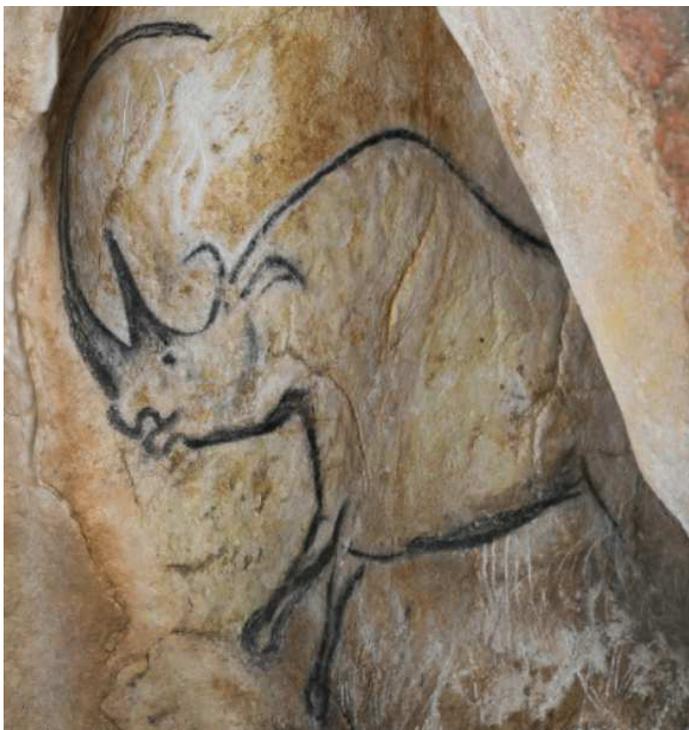


Photo: Grotte Chauvet website

Each tour takes approximately an hour. The tours are conducted in French, but the facility utilises quite advanced technology for those who need information in other languages. The English guiding, through headphones, operated on a basis whereby each of the points where the tour guide was stopping to give a presentation to the remainder of the group (of some 10 other people), our receiver sensed where we were in the facility and delivered us an appropriate English commentary for that location.



Photo: Tim Moore

School education facilities

There were some three or four workshop rooms available for conducting the more intimate and specifically focused educational activities for younger people.

My son and I sat in on the workshop concerning Neolithic use of fire, a workshop that was conducted despite the fact that there were only four children wanting to observe. Although my French language skills permit me to operate at survival level, they did not enable me to follow the full detail but I understood sufficient to know that it was comprehensive and pitched at level appropriate to the young people participating.



Photo: Tim Moore



Photo: Grotte Chauvet website

Lascaux 4

The Lascaux Cave complex is located on the outskirts of a small town named Montignac on the Verzere River (a tributary of the Dordogne).

The present, major visitor facility is known as Lascaux 4. How, you might ask yourself, does Lascaux get to 4 while Chauvet is only 2? The answer is because Lascaux has undergone greater evolution of its visitor facilities since the decision was taken in 1963 to close the Lascaux Cave proper to public visitation.

Public visitation had been taking place in Lascaux Cave proper since July 1948. It was only after some 15 years of direct access that the potential for degradation as a consequence of regular, comparatively high frequency (although regulated) actual visitation placed the artwork values of the Lascaux Cave in danger of being damaged. As a consequence, in 1963, it was decided that Lascaux Cave should be closed and a replica constructed comparatively nearby on the ridge to the south of the town where Lascaux Cave is located. This replica of Lascaux Cave, opened in 1983, is known as Lascaux 2. As earlier noted, it is still operational as a tourist facility but is only open during an extended tourist season from approximately mid-April until the end of September. As we were visiting in midwinter (early January), we were unable to visit Lascaux 2.



Photo: Lascaux 4 website

We were also unable to inspect anything associated with Lascaux 3. This is because Lascaux 3, a comparatively recent addition to the Lascaux Cave complex, is an itinerant exhibition that tours schools in France to expose them to the beauties of Neolithic cave art and the lives of the Neolithic artists.

Lascaux 4, however, is a modern tourist facility opened in 2016. Like Chauvet 2, it is a replica precisely mirroring important elements of Lascaux Cave. Unlike Chauvet 2 where the elements of that complex are spread across a campus of some 10 hectares, all the elements of Lascaux 4 (including a quite splendid restaurant) are in a single building. We arrived late in the morning on a Tuesday just after the conclusion of the French winter school holidays. Several school groups were present, undertaking school excursions.

Access to the reproduction of Lascaux Cave is also controlled with tourist access being confined to groups of a maximum of eight people plus a guide.

I enquired at the ticket counter whether it would be possible for us to join a tour group, preferably one where the commentary was conducted in English. The helpful concierge made an enquiry and advised that a tour could be undertaken, with an English speaking guide, if we were to wait some 15 minutes for the group to assemble. Unsurprisingly, we agreed.

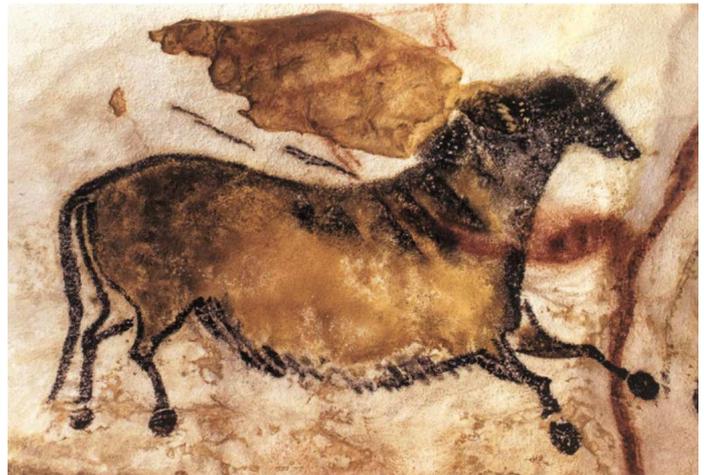


Photo: Lascaux 4 website

A little later, our tour group assembled and we were introduced to Christian, a qualified cultural mediator, who was to be our guide. To our great delight, we discovered that we were the total membership of a tour group of two – resulting in us getting a personal guided tour in English and with a highly qualified guide, to the Lascaux 4 reproduction of significant elements of Lascaux Cave.

We had, effectively, an intimate question and answer session with Christian for some 1.5 hours. His knowledge of technical matters concerning the artwork and the palaeontological theories concerning the lives of the artists was comprehensive and extraordinarily good value for the €20 entry fee for each of us.



Photo: Lascaux 4 website

After a long period with Christian in the reproduction of the element of Lascaux Cave, we continued on a self-guided basis to the other two elements of Lascaux 4.

The first of them, in a large high hall, contains duplicates of various of the elements that have been put together to make Lascaux 4. Each of these elements is linked to a multilingual audio explanation delivered through headsets with language selection on the controller. The explanation not only tells of what has been reproduced, but also how it was reproduced and assembled. Although entirely different from the nature of the presentation at Chauvet 2, this element of Lascaux 4 was also fascinating.

The final element of Lascaux 4 was a sequence of audio visual presentations across five or six rooms outlining elements of the history of Lascaux Cave and the theories concerning the lives of its Neolithic artists.

Grotte de Font-de-Gaume

Grotte de Font-de-Gaume is a much smaller cave art site on the edge of the village of Les Eyzies-de-Tayac-Sireuil in the Vézère River valley. This The Dordogne Valley and its complex of river valleys tributaries are rich in ancient art sites, many of which are in private hands and are run as small-scale tourist operations.

The five or six ancient art sites we attempted to visit during our few days in the vicinity of Lascaux 4 were closed for their “*fermeture annuelle*”. Fortunately, Grotte de Font-de-Gaume is a publicly owned site that continues to operate throughout the winter months. Although there is a small visitor facility, it is quite modest in scale. Accessing Grotte de Font-de-Gaume requires a walk of some 400 m or so from the car park along a well-made but somewhat steep path.

There are two principal differences between Grotte de Font-de-Gaume and the Chauvet and Lascaux complexes. Grotte de Font-de-Gaume is a site where direct access is permitted into the principal, but quite short cave passage where its art is located.

The second difference between Grotte de Font-de-Gaume and Chauvet Cave and Lascaux Cave is that Grotte de Font-de-Gaume was also a habitation site with support points for structures carved into the walls of the rock overhang just outside the entrance to the cave.



Photo: Tim Moore

It is clear that the rock art at Grotte de Font-de-Gaume may have played a role in the day to day lives of its residents, a position distinctly different from Chauvet Cave and Lascaux Cave.



Photo: Font de Gaume site

Grotte de Font-de-Gaume is also a small group visitation cave with access being tightly controlled. Limited numbers of groups per day, and in groups of six or so, plus a guide are all that is permitted. The tour, including walking to and from the visitor facility, takes a little more than an hour. Again, because we were visiting out of season, our tour group comprised, in addition to my son and me, a French woman and her sixth grade daughter. Our guide was multilingual and gave a commentary to the French participants in their language and then a commentary to us in English.

Conclusion

There can be absolutely no doubt that the cave art in Chauvet Cave and Lascaux Cave warrants the careful and controlled preservation which it is now afforded by the virtual total exclusion human visitation. Equally, there can be no doubt, in my opinion, that making an appreciation of this art available to a wide public audience provides desirable understanding of not only its spectacular beauty but of the extraordinary skills of the ancient artists who created it.

It would not be sufficient, for a proper appreciation of what was achieved by those ancient artists merely to show recorded images as such images lack an ability to appreciate the subtleties of use of the shapes of the walls of each cave to give depth, perspective and a sense of movement to the animals there depicted.

While a visit to Grotte de Font-de-Gaume was, for us, unique, the overall scale and interpretation available at Chauvet 2 and Lascaux 4 (including the associated interpretive materials in conjunction with the cave replicas) provide experiences not to be derided as lacking authenticity.

L'Aven d'Orgnac

Tim Moore

In my experience of show caves, L'Aven d'Orgnac is significantly deep. Tours commence by descending a direct line of stairs (no landings) to a point some 120 m below the entrance. The cave tour winds some further 30 m or so downward. I undertook this Cave tour while my 15-year-old son undertook an adventure caving activity known as Souterrain Vertige (Subterranean Vertigo). The reason for this will later become apparent. For reasons which also will later become obvious, undertaking this adventure caving activity is limited to a maximum of four participants plus the guide. There were only two participants when my son, Luke, undertook the activity.

The alternative entrance to the cave is via the original discovery point, a hole in the roof, followed by a freefall abseil of some 60 m, a matter relevant as will later be seen.

The cave tour was an entirely conventional one with the guiding conducted entirely in French. As noted in the preceding article, I was able to follow a deal of what was said. Perhaps because there were a number of teenage or younger children in the group of about 25, there appeared to be a deal of old-style description identification in the guiding patter. In addition to hearing conventional karst related words, I also heard Mickey Mouse and Snow White!

Shortly after we exited the foyer at the foot of the stairs, the guide indicated that we were to be the beneficiaries of an acrobatic display.

We were invited to turn and observe the hole in the roof. Suddenly, two figures in red overalls appeared, descending down a pair of ropes. It was Luke and his tour companion. I was not concerned, as my son is a competent abseiler. However, the next entrant, after these two had got off rope, was the guide who descended headfirst doing back flips as he went (this being the acrobatic display for the tour party).

Although there was, at least at this point in the cave, a deal of natural light, photographic opportunities were limited given a ban on flash photography. However, for purposes of this Journal, I was able to take three photographs that did not suffer from the wobbles (as a consequence of the time the lens needed to be open). The first of these appeared earlier and the while the next two illustrate the following interview with my son.

L'Aven d'Orgnac's website contains a short video of this adventure caving activity. It and my son's brief description of it to me made me decide that a short piece might also be of interest in this Journal. Given the communications skills of teenage boys, I concluded that the appropriate way to obtain relevant material was to record and transcribe an interview with him!

The photo at the top of the next column shows the original entrance through which the abseil occurred.



Interview with Luke Moore

ED: What sort of briefing did Stephan give you before you started the activity?

LUKE:Stephan told us how to put on the safety equipment and, after we put on the safety equipment, he checked it over. Then, once we got to the top of the abseil, he secured us into the abseil and secured us together so it had a more controlled pace.

He also, once we were about to start the climb, he told us how to connect the clips and always to have one clip connected at all times.

ED: How did it feel doing that long, diagonal traverse across the face of the main chamber, about 40 metres above the floor?

LUKE:The traverse was fine, exhausting and a little bit scary. It was pretty high off the ground, but there was always a ledge before the floor, the very floor of the chamber, so it wasn't 40 metres from the ledge. So not as high as it would seem from the ground.

ED: Where did you go after you got to the top of the traverse?

LUKE:At the top of the traverse there was some, a little bit of mild caving, where we just walked and did some minor climbing through a 20-30 metre area and then we arrived at a second cave room and there was some more walking before we reached a second traverse that went towards a decline.

ED: How far away from the end of that traverse was the zipline?

LUKE: We circled around the second room and got to the zipline. It was probably, I don't know, 50 metres or so of traversing, but there was also probably 50 metres of walking on rocks as well.

ED: Did you have to do any crawling or squeezing?

LUKE: There was no crawling, but you couldn't walk at full height in that part of the walk through to the second area.

ED: How long was the zipline across the cave and how far was the drop below it?

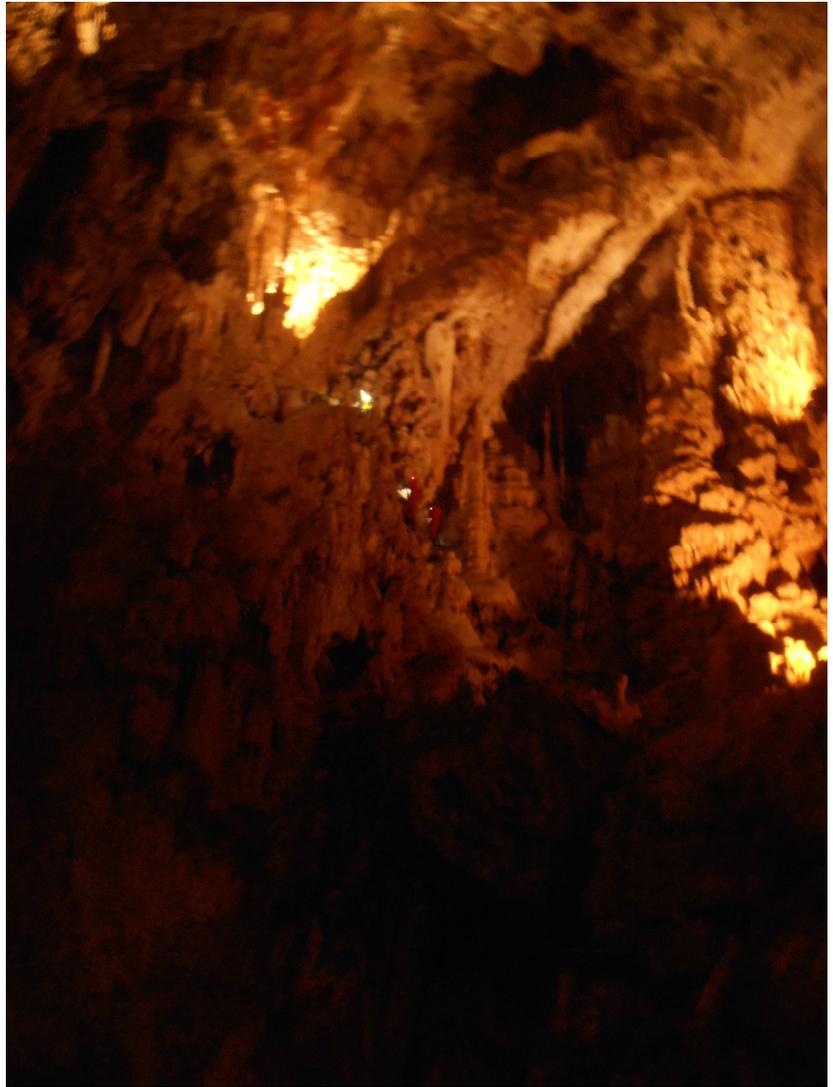
LUKE: The zipline was probably, in length of the rope, 10 metres maybe, maybe a bit more, and in height, across the cables, probably 10 metres, maybe a bit less.

ED: And what did you do after you got off at the far end of the zipline?

LUKE: At the end of the zipline, there was a walking down some rocks, may be a little bit of climbing. Just down rocks, not anything really, and then we joined in with the guided tour at the very end.

ED: And did that mean you made your way back up to the surface using the lift?

LUKE: Yeah, we made our way back up just using the lift.



Two small red figures in centre of traverse. Photo: Tim Moore

Remembering Alan Costigan – Buchan Caves Reserve

Dale Calnin

Alan Costigan sadly passed away in October 2019. He was one of the early Life Members of ACKMA and was a much loved and respected Cave Manager at Buchan Caves Reserve between 1973 to 1987.

Alan was my first Caves Supervisor when I first started work at the Buchan in 1974 as 15-year-old casual guide and then later when I became a full-time cave guide in 1978.

It was Alan or "Cossie" as he was affectionately called who first introduced me to the intriguing world of Cave and Karst Management and the importance behind it.

Alan was a funny man and there was never a dull moment.

He was an integral member of the local Buchan community and a very passionate supporter of the Buchan football team "The Cavemen". He was never short in letting the opposition know what he thought of them and umpires certainly copped their share of his advice.

He was well known for his wicked sense of humour but behind all the fun and laughter was a very clever mind and a pioneer in many environmental management initiatives.

Alan enthusiasm for caves was contagious that flowed through to his staff and the many visitors to Buchan Caves Reserve.

During Alan's time as manager, he forged a strong relationship between Victorian Caving Clubs, a growing interest in wild caving and the idea of opening less explored caves within the Buchan district.

He was instrumental in the offer of Adventure Cave Tours for visitors through the Murrindal, Lilly Pilly and Federal Caves.

He played a key role in the introduction the cave watering filtering system into the Buchan show caves system to enable cave restoration and treatment of decaying calcite surfaces.

Cave visitation was over 80,000 visitors per annum and growing and the Buchan Caves campground often packed with visitors particularly during the peak holiday periods.

In the early 1980's he was instrumental in overseeing one of the first Waste Water Sewerage Treatment Plants being used by Parks Victoria. He fondly referred to it as the "Shit Machine" and would often humour his family when he regularly went to check the "bugs". Again, in an era when sustainability was not a key focus, he was ahead of the game for environmental preservation.

Many of Alan's initiatives can still be recognised today at Buchan which is a living testimony to him and his extraordinary vision in environmental protection.

May he long be remembered.

Andy Spate adds his memories of Alan:

I have three very fond memories of Alan Costigan. I am not sure which memory comes first. He had a remarkable sense of humour – perhaps a little warped at times. The first story relates to Buchan – when you drove into the Buchan Caves at that time you encountered a sign saying “Motorists – please read the next sign”. The next sign directed to you to the ticket office in the manager’s house above the road. This may be apocryphal, but it is said that Alan put up a second sign that said “Motorists – please ignore the previous sign” – what evolved is open to conjecture.

My other main interaction with Alan was at the 1981 Cave Tourism Conference in Western Australia. I was met off the plane by Joy ‘My Smith’ Smith from the Bussellton Tourism Association – and introduced to Alan – who denied ever knowing me in spite of many meetings over the years. Minutes later the manager from Cutta Cutta arrived – who denied knowing either of us. Much laughter ensued over the next few days.

The third interaction was camping beside Cossie’s ‘shit machine’ – no odours or other issues – but other campers kept on asking what the green ‘shit machine’ was and why did we camp near this unsightly green brick – it was the quietest part of the campground but most didn’t understand why but avoided that site for some unexplained reason. Good for us then ...

Caves Beach (south of Newcastle)

Kent Henderson (story and photo)

Recently I was in the Newcastle region of New South Wales - for only the second time in my life. Driving up the Pacific Highway, I noted a sign to 'Caves Beach'. Intrigued by the name, I diverted.

Caves Beach is a locality on the Swansea peninsula south of Lake Macquarie. It is named for the large number of sea caves on its nearby coastline, adjacent to a popular surf beach. There is a lookout at the top of the cliff face, offering excellent views over the caves below. A walking track brings you down to the beach to left of the field of sea caves which, not surprisingly, are best accessed at low tide.

My luck was in - low tide greeted me. There are a substantial - well over a dozen - sea caves in the cliffs, some of quite reasonable size. I spent a pleasant hour rambling between them. And I was not alone; maybe a dozen other people were 'wandering around' (on a Monday morning - hardly a peak tourism time!). Clearly, these sea caves are very well-known locally. The geology is fairly straightforward. The cliffs are conglomerate, dumped by fast-flowing rivers about 250 million years ago during the Permian period. The caves probably began forming about 6,500 years ago, after the last glacial period when the rising sea stabilised at its present level.



View out from the largest sea cave

Management of the area, if you can call it that, is interesting. Happily, many sea caves at various Australian locations are largely protected by their relative inaccessibility. Not so here! Of course, the name itself is something of a magnet. Given that people will go regardless, the local council response has been to make it as safe as possible, with an excellent lookout at the top of the cliff and proper tracking down to sea level. Other than that, appropriate interpretative signage at the lookout would be useful, but was sadly absent. That said, if you too are passing at some stage, a stop at Caves Beach will not disappoint!

**Invitation for ACKMA members to participate in the
19th International Symposium on Vulcanospeleology**

Catania, Italy, 30 August to 5 September 2020

John Brush
Chairman, UIS Commission on Volcanic Caves

The historic Sicilian city of Catania, which lies in the shadow of the active Mt Etna volcano, is the venue for this year's International Symposium of Vulcanospeleology.

ACKMA members are welcome to participate in the symposium.

A full program of activities is being planned, including:

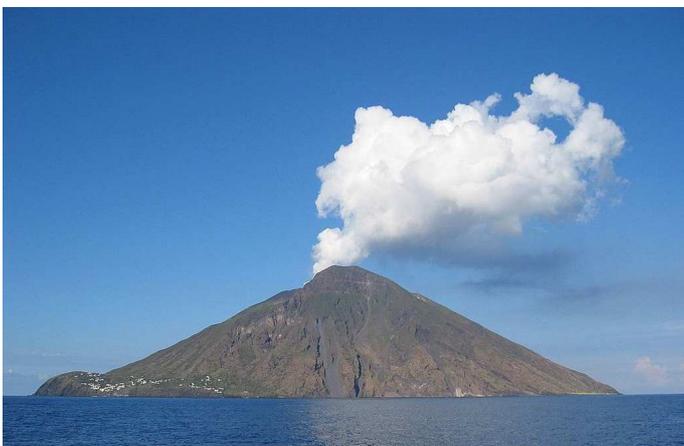
- presentations on research, exploration and documentation of volcanic caves;
- visits to local lava caves on several days;
- several excursions to volcanic features in the Mt Etna area, including to the summit area (eruption activity permitting), and to the site of the devastating lava flow of 1669;
- scenic and cultural tours in Catania and along the eastern coast of Sicily (aimed at accompanying persons, but several well-known cavers have already signed up!);
- a range of social activities, including a fair for symposium participants to view and sample products of local artisans and agricultural producers (ACKMA members should note that a local winery is a major sponsor of the symposium); and
- a 5-day post-symposium excursion to the Aeolian islands, including to the area of the Mt Stromboli volcano (this trip is already almost fully subscribed).

The symposium officially commences on Saturday 29 August, with major activities (an optional geological excursion around the Mt Etna area and a welcome party) commencing the following day. The formal program ends on the evening of Friday 4 September and the post-symposium trip to the Aeolian Islands departs by boat the following morning.

The symposium is being organised by the Gruppo Grotte Catania (GGC), a local caving club, on behalf of the UIS Commission on Volcanic Caves. For logistical reasons, GGC has set a limit of 80 participants. As at 20 February, about 50 registrations had been received.

Despite the current terrible situation with Covid-19 in Italy, the organising committee is continuing its work on the symposium and hopes to be able to run things as planned. However, it will continue to assess the situation and will make a final decision on whether to go ahead, postpone or cancel the symposium on 30 June. It is possible this decision date may be brought forward if it becomes clear that postponement or cancellation are the only realistic options.

The registration fee for the symposium is a modest €280 and (€230 for accompanying persons). Some excursions are included in the registration fee and others are at an additional cost. Detailed information on the symposium, and the registration form, can be found on the 19th ISV Website: <https://www.19isvetna.com/index.php>



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1. The Stromboli volcano. Photo: Carmelo Bucolo
2. Pollara area on Salina Island. Photo: Carmelo Bucolo
3. A large lava roll in Catanese II Cave. Photo: G. I. Sanfilippo

Artesian Karst Springs in Northern South Australia

Miles Pierce (story and photos)

In the course of a recent trip into northern South Australia in our elderly Toyota 4Runner, my wife and I spent some time away from the corrugations of the Oodnadatta track visiting the well-interpreted Strangways Springs, about 30 kilometres south-west from William Creek. Here, a cluster of so-called 'mound springs' were an important source of water to nomadic aboriginal tribes in pre-European settlement times and subsequently during European settlement.



Looking into a mound spring

The Strangways Springs were first recorded and named by explorer Peter Warburton in 1858. From 1872 to 1896, they were the base location of a pastoral station - Strangways Station - the building ruins from which add further interest to the site¹. It was also the location of one of the 11 manned repeater stations on the Overland Telegraph line from Adelaide to Darwin and, later, a watering point for steam locomotives on the original Ghan Railway.

The Strangways mound springs are one of the many natural springs in the eastern part of Central Australia where pressurised fossil water from the Great Artesian Basin (GAB) reaches up to the land surface. The springs typically occur around the margin of the GAB where the water-bearing aquifers abut adjoining basement rock.

A characteristic of the many such springs in the region to the south-west of Lake Eyre is the substantial mounds that have formed around them due to cementation of sand and clay particles by precipitated carbonates, notably calcium carbonate, combined with some natural surface erosion².



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At the Strangways site, individual spring mounds range up to an estimated 10-15 metre in diameter and three-to-four metres in height. A few of the mounds still have a trickle of artesian water emanating from them, while others exhibit only seepage. Several appear to have dried up completely.

From observation, calcium carbonate has clearly been a major component in forming and stabilising the spring mounds. The pool at the top of 'Sedge Spring' - see photograph - is hemmed with limestone. The 'Waterfall Spring' has a quite large section of calcite flowstone extending downwards from one side of its 'summit' pool with water trickling over it, giving rise to the name.

The mound springs in this arid part of northern South Australia have, for millennia, supported native flora and fauna, with the former comprising both dryland and wetland species, some of which are considered to be unique. While water flow from the mound springs likely varied in the distant past, the drilling of bores to exploit the artesian water source since European settlement has reduced or terminated outflow at many of the natural springs due to bore drawdown causing a lowering of the 'water table'.



The wall of a mound

Although the surrounding landscape is not karst per se, the precipitation of calcite from the artesian water is a significant factor in the formation of the distinctive mounds. Presumably (my conjecture), the slow-moving artesian water that resurges from the mound springs has been in prior contact with

buried limestone deposits and the calcium carbonate dissolved therefrom is then precipitated when the water reaches the surface. By reference to Ford and Williams³, I think that I am justified in considering the mound springs to be karst features; however, others may differ. I await future 'letters to the editor' in dispute.

1. Brochure, 'Strangways Springs Walks' Friends of Mound Springs and S A Govt. 2016.
2. G M Mudd, 'Mound Springs of the Great Australian Basin in South Australia: a case study for Olympic Dam', Environmental Geology, Vol 39, No 5, March 2000.
3. D F Ford & P Williams, 'Karst Hydrology and Geomorphology', Wiley 2007.

The mounding of the springs is obvious

Philippines Karst Adventures:

Part 5 - The El Nido Karst

Kent Henderson (story and images)

The El Nido karst area is, to say the least, iconic. It is located at the top end of the Philippines island of Palawan - basically, the top half of Palawan is karst. My first Palawan karst experience was in January 2017, when I visited the truly fabulous world heritage-listed 'Underground River Cave' (at Sabang Beach, see map) - one of the 'New Seven Wonders of Nature'(1) and, without question, it should make anyone's list of the top 10 cave/karst sites in the world(2). It is located mid-Palawan.

I visited the El Nido karst on a separate trip in June 2018. The geology of Palawan is, in many ways, unlike other parts of the Philippines. It is largely tropical coastal karst - consisting of towers, cones, huge depressions and large caves. The El Nido area, with its innumerable tower karst islands, is often compared with Ha Long Bay in Vietnam.



A brief geological abstract is as follows:

- 'Several features suggest a long and multi-stage evolution of the Palawan karst, whose age ranges from Pliocene to present. The southern and northern sectors of the area differ in their altimetric distribution of caves. In the southern sector, some large caves lie between 300 and 400 m ASL and were part of an ancient system that developed at the base level of a past river network. In the northern sector (El Nido area), some mainly vadose caves occur, with a phreatic level at 120-130 m ASL. Morphological features include horizontal solution passages and terraced deposits. The age of this phase is probably Early Pleistocene, on the basis of assumed uplift rates. The more recent caves are still active, being located at the current sea level, but they show more than one cycle of flooding and dewatering (with calcite deposition).(3)

While there are several resorts dotted around the El Nido area (from very reasonable to very pricey!), I stayed in a pleasant hotel in the El Nido township, right 'on the

beach'. The town is not large, is quaint, and 95% of its employment is tourist-related. There are four standard tours available, bookable anywhere you stay. These are imaginatively named Tours A, B, C, and D! All involve a day trip on an outrigger motor launch to various parts of the El Nido karst. You can buy a ticket to a group tour (thus helping to fill each boat) - the cheapest option; or you can book a private tour (costs more, of course). Tour A is the most general, most run, and most popular. 'Everyone does it', including me! All tours include an exotic lunch on an equally exotic beach.



Tour B, however, is the one that, for the likes of you and me, is not-to-be-missed! One gets to enjoy white-sand beaches, snorkelling, but also visit two caves. The first merely involves a close approach to a very interesting large cave entrance - known as 'Cathedral Cave' - at sea level, in a tower karst island. The second involves 'proper caving'; if caving in togs and thongs can be called proper! Here, you are taken through a slight squeeze into a large, and largely concealed, sea cave; again morphed at sea level in a small karst island. Interesting and fun. It has interesting speleothems and large tree roots - not dissimilar to Capricorn Cave, at Rockhampton. Similar morphology, of course.

So, management? The outrigger motor launches, of which about 100 operate daily in peak season (January to March/April), are individually owned and operated by locals, although they all cooperate, as it were. They do have very strict rules about waste - nothing (such as lunch remains etc) is left behind, and nothing is thrown into the sea. As a result, every location I visited was quite pristine. Very good stuff indeed. Even El Nido township was, by general Philippines' standards, quite clean and tidy. Every night the El Nido township beach is filled with pop-up restaurants specialising in local seafood - you choose, they cook. Very pleasant.

In short, if you are after a great karstic holiday and experience, El Nido definitely fits the bill!

References

1. https://en.wikipedia.org/wiki/New7Wonders_of_Nature
2. See ACKMA Journal No 106, March 2017.
3. <https://onlinelibrary.wiley.com/doi/abs/10.1002/esp.2078>



Denis Marsh traversing the chasm on page 11 but using a different technique. Photo: John Brush