



C.D.A.A. Newsletter

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CAVE DIVERS ASSOCIATION OF AUSTRALIA

(Incorporated in South Australia)

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Cover:
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GUIDELINES is a newsletter of the Cave Divers Association of Australia. All articles for the following issue are to be sent to the designer, David Bryant, Email: seapicsdavebryant@gmail.com

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CDAA INSURANCE

Policy Type: Combined Liability Insurance Policy# SY-CAS-08-041140
Insurer: Liberty International Underwriters ABN: 61 086 083 605
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CAVE DIVERS ASSOCIATION OF AUSTRALIA

Editorial

During the production of this issue of Guidelines I received a phone call from Ian Lewis in Adelaide. He called to advise me that a diver had been lost in Tank Cave. Neither of us knew who it was but Ian had an idea because there were divers names listed on the website who were in Tank on that day. Ian wanted to mention that Guidelines might have to be ammended once we found out who it was. 3 days later it was confirmed that it was Agnes and my heart sank. I couldn't believe it.

I first met Agnes a couple of years ago when she was working with Tony Davis at Dive Rite. I knew nothing about her but I could see she was a real go getter and keen as mustard to dive caves and travel the world doing just that. Then she started writing articles for Guidelines and soon she was a household name as far as cave diving is concerned.

She was considered by many a true explorer, a young lady with a wealth of knowledge and experience, having travelled the world and dived with some of the best in the business. One of her closest friends was Wes Skiles, who also tragically died whilst diving. The video on Ag's website was filmed by Wes and a real testament to her diving and his filming.

The worst outcome of all this is we won't see her smiling face at the Mount on weekends or at CDAA functions, and she'll be sadly missed not only by her family but the vast amount of cave divers for whom she captured their hearts with her passion, drive and zest for life. I didn't know Ag all that well, and I wish I had spent a moment longer getting to know her and understand her love of the sport. I was however priveleged to hear from her in the days leading up to the production of each Guidelines. Her emails always read about recent travels. She would tell of her last dive trip and of course there would be an article and several stunning photos for the next issue. Guidelines was a great read with her regular articles.

This issue features two submissions from Agnes, which once again show off her talents in both personal and professional situations. Agnes was a stunt diver in the production of 'SANCTUM' and she shares her experiences with us, not to mention a rave review of the movie and it's actors. Her second story takes us into the depths of Florida's fresh water springs.

Ag touched us all and I'll miss her get up and go attitude to life. It would have been nice to see her live a full life. She had so much more to do on this earth and I would have looked forward to reading about her travels and discoveries.

This issue of Guidelines also features an amazing exploration of an underground mine in Sweden by Dmitri Gorski. The pictures are amazing and the story Dmitri indicates why cave diving is such a unique and interesting pasttime. Once again exploration at its best and most inspiring.

Ian Lewis takes us on a journey into the geology of caves in the Nullarbor with some wonderful photos he shot many years ago. Peter Buzzacott reports on a an update of Nullarbor Cave and fish being found in Murra El Elevyn.

Tara has some new books available and you'll see that from now on all Products are to be purchase using the CDAA website.

The quality of articles and pictures this issue are stunning, so sit back and have a good read - and dream up 'your' next dive destination!

Keep the great articles coming, email me any time....

all the best, Dave Bryant.

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Murra El Elevyn Update

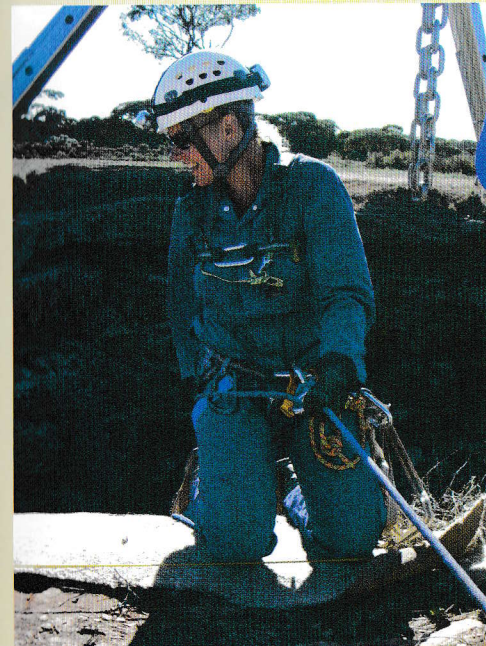
by Dene Buckley, Pippa Waterworth and Peter Buzzacott

Rumours of fish in a Nullarbor cave remain unconfirmed. Recently, a team of us began examining the diveable Nullarbor caves with the aim of ranking them in order of their theoretical ability to support hypogean fish. One aspect of our inquiry is to examine resident colonies of microbial mantles, which are a potential food source for these "mythical" fish. The team were granted permits for the research project and, during a return trip to Murra El Elevyn in early in 2010, it was observed that the mantle colonies appeared to have varied in abundance, at least since they were initially recorded by us in Sept. 2009.

Previous research by Holmes et al (2001) had suggested that mantle colonies were probably slow growing so we found a visible variation over six months surprising. Possible explanations we considered included a connection to water temperature within the cave, or that the biomass (colony size) might actually be seasonal. Though members of the team do have some relevant academic qualifications in this sort of research (Zoology, Botany and Population Health) we are not experts in speleobiology. Due to a fortunate set of circumstances one of the team was able to attend the 20th International Conference on Subterranean Biology in Postojna, Slovenia, in September 2010. This provided a great opportunity to discuss our observations with a range of scientists.

The team applied for funds from the CDAA to produce a scientific poster and to register for the conference. At the conference over 200 scientists visited the posters on display and many presentations were attended describing the latest research technology, including genetic testing improvements and new survey instruments. A couple of European scientists expressed an interest in genetic phenotyping Murra's mantles using new cloning procedures, and an Australian scientist offered to lend us microscopic sieves to conduct micro-fauna surveys. Both these potential extensions to our project could be beneficial to our understanding of the cave's biota but are in the conceptual stage for now.

Meanwhile, the other members of the team returned to Murra El Elevyn to see if the mantles had noticeably grown over winter, when higher rainfall may have carried dissolved nutrients into the cave. There did seem to be a greater abundance of the mantles suggesting the possibility there may indeed be seasonal fluctuations of biomass, however repeated quantitative measurements have not yet been made so, for now, our evidence



remains largely anecdotal. If, through rigorous measurement, the mantles are found to be seasonal then this may challenge the view that they are slow growing (Holmes et. al., 2001). Slow growth could be considered a reason why they might not support a population of fish, so a seasonal change in the mantle colony would prove a neat discovery (but, we are not there yet).

In summary; though we started looking for Nullarbor fish, already the project is yielding leads that may prove scientifically interesting



Mantle

and we are being careful to tick all the boxes in terms of permits and proper protocols. An article describing both the research and the CDAA's support has also been submitted to the journal of the Australasian Caves and Karst Managers Association.*

Our future goal is to objectively record the abundance and range of mantle colonies in Murra El Elevyn, over several years, which should verify if the mantles in Murra might be seasonal. Our next step is to conduct a more detailed survey of the habitat range. If any CDAA members have an interest in contributing to the project then please e-mail us at nullarborfish@hotmail.com



Peter Buzzacott

References:

Holmes, A.J., Tujula, N.A., Holley, M., Contos, A., James, J.M., Rogers, P., and Gillings, M.R. (2001). Phylogenetic structure of unusual aquatic microbial formations in Nullarbor caves, Australia. *Environmental Microbiology* 3(4), 256-264.

The Taming Continues:

The Peacock to Baptizing Connection

Agnes Milowka and James Toland

In August 2010 James Toland and Agnes Milowka made the connection between Peacock Springs and Baptizing Spring. The connection between the two springs extended the Peacock Springs Cave System by over 10,000 feet (3km), adding significantly to its already extensive 28,000 feet (8.5km) of passage.

In this Interview Agnes and James will share the thrill of adventure and exploration as they pursued their first connection.

Agnes: Many people assume that everything in Florida has been found and explored. How then is it possible that you guys are finding new caves, even in popular systems such as Peacock Springs?

James: Many divers from the Florida cave diving community are focusing on exploration around the world but I think it's important to focus on exploration in our own backyard – a little something I like to call tailgate diving.

There is still a lot of caves here waiting to be pushed and with the evolution of dive gear and divers alike comes the ability to do deeper and longer dives. This opens up new and exciting opportunities that were overlooked or never considered in the past.

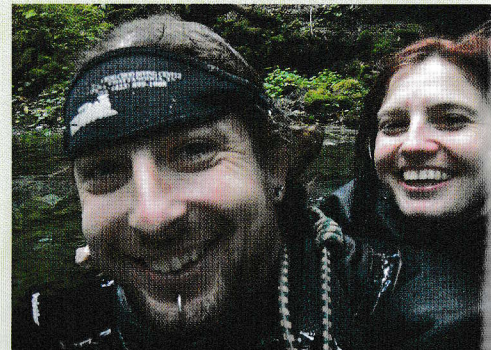
Agnes: I think it comes down to attitude. Too many people assume everything has been lined and explored and they are only too happy to follow the lines already there. While there is a culture of exploration in Florida, popular caves like Peacock don't get a look at these days. I guess it just goes to show that the possibilities are endless and the potential is still there even in popular and often dived caves.

How did you find the lead that eventually led to Baptizing?

James: Ag was off running down some leads with one of her regular dive buddies and hits the jackpot. After confirming the lead was a go it was on. She contacted me and said let's lay some line, obviously she really had to twist my arm.

Agnes: I was actually doing a fun dive with another buddy and we decided to check out a section of Peacock I hadn't seen before – the water source tunnel for the Peanut Line. As it got tighter and smaller I knew we were coming up to the end of the line and I was super curious to see what happened next. Finally the line ended and as I suspected the cave kept on going. It was a bit tight and quite muddy but it was definitely still going. I tied off and used what scraps of line I had left on my reel to check out what lay ahead. I laid 200 feet (60m) of line on that dive and decided it was a goer.

I knew it was going to be dirty going through the mud flats and there is no solo diving in Peacock, so I called up James. James and I had done a fair bit of diving together in nasty places, so he was an obvious buddy choice.



So you found the lead and it looked promising, talk us through your next dive.

James: We hooked up to do a shake down dive and make sure this thing was still going. Ag told me it's tight and muddy but it has good flow, but that it didn't look like it was going to open up anytime soon. She put me in the lead on the dive and we are off, a reel each ready to go.

We used a stage to get to the jump and sidemount 120s for the dive. We got to her EOL and I tie in. Pushing forward only another 200 feet later we popped out into a sizable cave. Rather large to be honest to what we just came through. Then the reel started making that beautiful sound, zing. Shortly after that the brakes hit, end of my reel. So Ag jumped into position and off we went again with her in the lead.

The cave was spectacular. Jackpot was an understatement. It was some of the easiest exploration I have done in a while. Soon Ag's reel was empty but the cave was still going strong. Having plenty of gas, good vis and no more line we made a slow exit to enjoy all the booty we just scooped. Ag surveyed out while I looked around for more leads.

It was a bittersweet feeling to have the time, the gas but no line at the end of a push. We laid 700ft of new line, which wasn't a bad effort. Although we did a 160 minute bottom time we had no deco, which was sweet.

Agnes: The next dive was pretty exciting. I expected the cave to go, as there was good flow, more than in most other areas of Peacock. I wasn't sure whether the cave would open up though; the Mud Flats would be quite a pain if they kept on going forever. I thought I'd do the right thing and let James have a

look at the cave, seeing as I've already been through once. Well, I regretted that decision pretty quickly. He went though and into the Mud Flats, I followed and saw absolutely nothing for several hundred feet. I saw that he tied in and pushed on, so I followed along, still in zero vis. Eventually the passage got a little bigger and I could see him reeling out just in front.

His line ran out and I tied in. Back in the lead and with crystal clear vis ahead of me I was having the time of my life. The cave was beautiful and I could hardly believe it was all still there for the taking. James was hot on my heels and we were having an awesome time. This of course didn't last long. The line on my reel came to an abrupt end. In front of us was more open passage, just waiting to be explored. Unfortunately we didn't have any more line – rookie error. So there was nothing left to do but head back and survey the day's prize.

Talk us through your second dive, did you bring more line this time?

James: A week later Ag and I were at it again, and yes, we were armed with more line and more gas. The mission was simple, put all the line in. I was graciously given lead again and we hit it. One reel, two reels, and then before we knew it the third reel was coming off. The cave decided to throw a loop into the mix and started breaking up and splitting off in several directions, so the T's started flying in. We managed to add over 1000 feet of line. In the end the dive was 280 minutes, but with an average depth of 35 feet (10m), we only incurred 10 minutes of deco.

Agnes: We did have more line this time and were armed with two reels each. Nothing was going to stop



us this time! We knew the dive was going to be a long one, so despite not being a morning person, I got up early. By 8am we were there, waiting for the gates of the Park to open.

It was an unbelievable dive. We just put down one reel after another and it didn't seem the cave was going to stop. Finally the way forward became less obvious and we had to start investigating various options and leads here and there. In the end these did not go places, but we felt we had a successful dive. You can't sneeze at dropping more than a 1000 feet (300m) of line in a day.

When did you know you were heading for Baptizing?

James: We started having suspicions on our second dive. After bursting through the Mud Flats, the low muddy portion of the beginning of our exploration, we started finding these green hairy mats of algae flowing through the tunnels. We noticed it the previous dive but didn't think much of it. On this dive we saw it in great abundance all over the new line that we put in. It was also all through the peanut line in very faint wisps. As we progressed in the cave it accumulated in larger masses and more frequently. I mean there were large clumps of this stuff. Then we started finding dead oak leaves in small clusters. All the tell tale signs of an opening.

Agnes: We knew we had to be close to an opening because of all the green puffy algae. I remember seeing lots of it at the entrance to Baptizing when I first explored it. It started to make sense that we were heading towards Baptizing, where else would all the flow be coming from?

I still remember standing by the banks of Baptizing with James a couple of years ago and speculating and discussing where all the water was going. Even then we figured it was heading to Peacock but we weren't sure whether a human could physically fit all the way through. Well, here was our chance to find out.

Tell us more about the moment you connected?

James: Ag was in the lead and she had the grand honor of tying in the lines at both ends. At the mark we chose would be the most likely, she put the reel in and 200 feet (60m) later there was the EOL from downstream Baptizing Springs. Ag tied that end off and we continued to push forward to make sure we had indeed done it. There was no question in our minds as we entered the pit just downstream of the entrance to Baptizing. We were unable to exit unfortunately, as the already super tight entrance restriction was filled in because of past floods. We did however see daylight and after a bit of digging opened it up a good deal. We returned the following day to do the traverse proper.

Agnes: It was incredible! I saw my old line and my blue 'Ag' arrow and knew we had done it! I was thrilled. I might have done a little dance right then and there, if not physically, certainly on the inside. It was nice to go back through old and familiar territory in downstream Baptizing. I was happy to see my line

was in good condition and wasn't buried, even after all the floods over the past year or so. The cave was suddenly a part of a much larger picture. By making the connection through to the entrance pool of Baptizing we had suddenly joined Peacock with the upstream section of Baptizing. This meant that the Peacock Cave System was suddenly over 10,000 feet (3km) longer!

The next dive, the swim through was a formality but it was also quite thrilling. To descend into one spring and come out another, 4600ft (1400m) further upstream was quite remarkable. A diver physically swimming through the passages demonstrates the hydrological link between the two springs and provides much food for thought. If a diver can swim through the water so can pollution and contamination and it's worth noting that the water that flows through Peacock comes a long way and everything that happens to it upstream has an effect on the quality of the water at the park.

Bob Schulte is an important part of your team, what was his role in regards to the connection?

James: The problem was that before the new exploration line Ag laid there was a section of line that was not knotted, around 400 feet (120m) of it. Ag and I tried to get the data with a tape measure coming out once but couldn't because of zero viz. This prevented us from plotting all the survey data out as a map, so we never had a real perspective of where exactly we were heading. Ag went back to Australia briefly, so at this point we brought Bob in on the fun and games. He and I got the missing survey data from the old line and surveyed the rest of the cave in more detail.

Bob brings some unique skills to the table. This dude is on fire with some mad skills in surveying, mapping and putting all our mumbo jumbo together. Bob is going to be tantalizing the cave diving world with his maps in the near future and he does absolutely amazing work – he is a must have on any project.

Agnes: Before actually making the connection dive, James and I spent a whole dive blindly chasing down leads. It was so frustrating, we knew we were close but could not figure out which lead was the magic one. We found all sorts of interesting things, but really we were after the connection.

It was only once Bob compiled the survey notes and created a map that our next move was made clear. Sure enough, once it was all laid out it was simple, less than 250 feet (75m) later and we hit the mark and made the connection. The map made all the difference and Bob's map is awesome. Meanwhile, just for the record, I have an axe to grind with anyone who lays line and doesn't knot it first!

Is this section of the cave unique, is there anything really cool in there or is it all low and muddy?

James: The cave is by far some of north Florida's best diving. Fossils litter the passages throughout the new exploration. After jumping off the main line the cave takes on a whole new look. The walls are without scars. The floors are littered with all types of bones; from ver-

PEACOCK SPRINGS STATE PARK ASSOCIATED CAVE SYSTEMS

Peacock Springs Surveyors

1996 Project Principal Survey Team:

Tony Pate, Michael Pouchier, Ted Cole,

Bill Renaker, Dennis Holden, Scott Worrel

1996 Project Survey Members:

Dennis Holden, Bruce Campbell, Steve Gerrard,

Bruce Pouchier, John Orlovski, John Dusk,

Tom McDonald, Bruce Duckworth,

Annette Gebius, Julius Tomels, Kerry Duffy,

Quenton Jones, Wayne Head, Steve Keene,

Elena Casson, Sue Sharples, Paul Logan

2010 Survey Update:

Agnes Milowka, Bob Schulte, James Toland

Peacock III Spring/Siphon Surveyors

Bill Renaker, Terry Pate, John Rankin,

Don Black, Mike O'Leary, Tom Turner

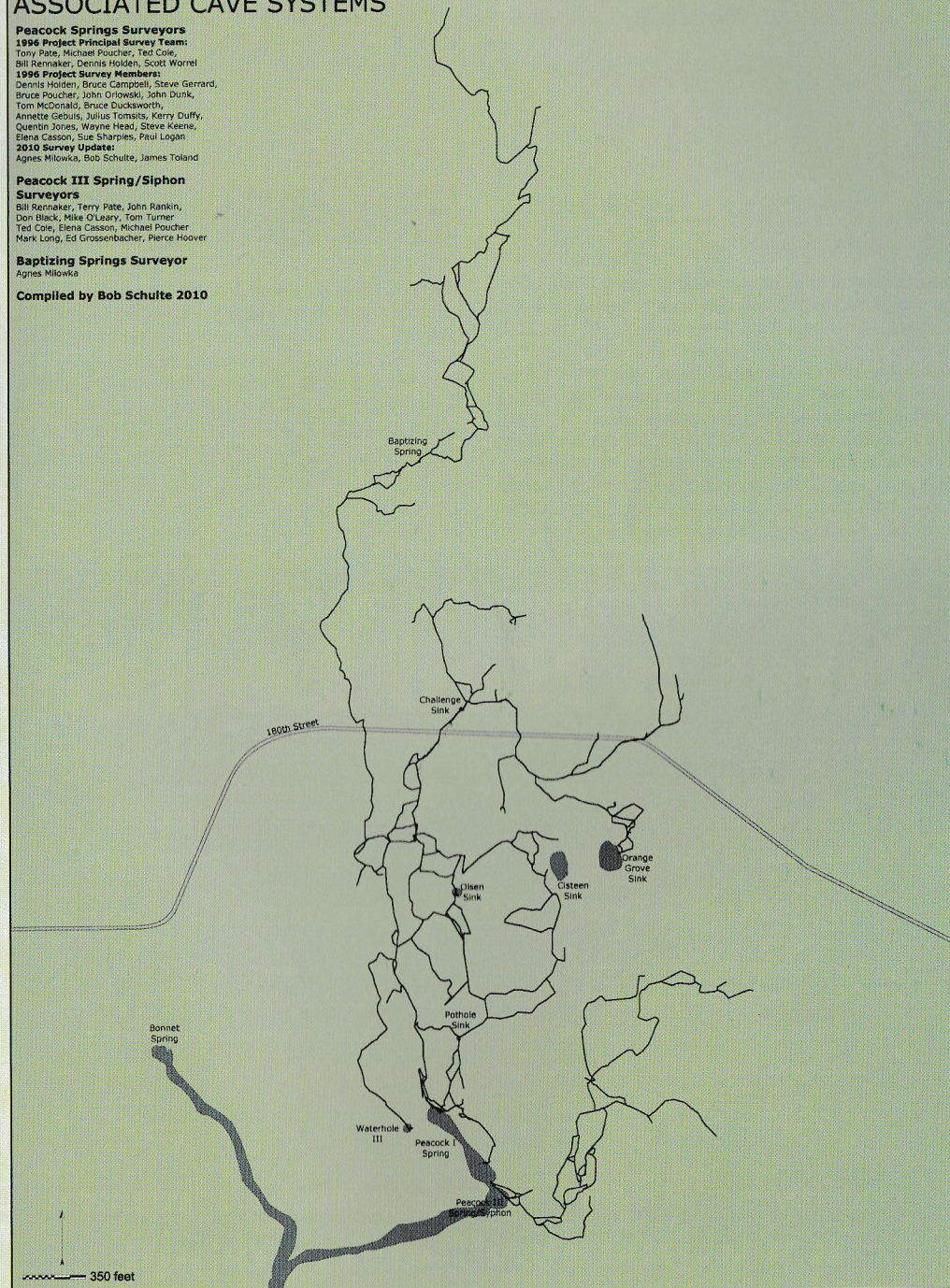
Ted Cole, Elena Casson, Michael Pouchier

Mark Long, Ed Grossenbacher, Pierce Hoover

Baptizing Springs Surveyor

Agnes Milowka

Compiled by Bob Schulte 2010

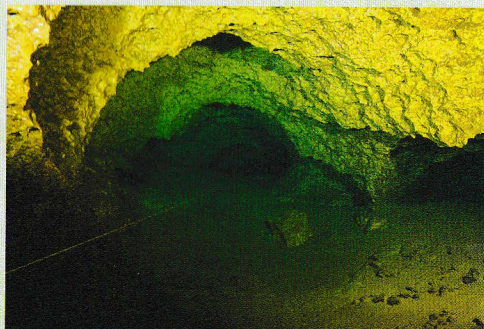


tebras, jaws, teeth, regular long bones, to areas that look like a seafood buffet as crab claws and extremities stick out of the walls. It looks the way a cave should look before the raping of all her treasures and diver traffic.

Passages range from a sizable borehole cave with sandy bottoms through to low restrictive muddy clay bottoms. Some passages are almost complete rock top to bottom. The flow dynamics are interesting and some areas have an exceptional amount of flow in comparison to the rest of Peacock. Then other areas have little to no flow, especially where the cave starts to spider web out. These areas are typically low and silty and have zero visibility on exit.

Agnes: I am a huge fan of Peacock in general. I think it is one of the most extraordinary and incredible caves in Florida. In my mind Baptizing will always be special, as it was my first venture into real and extensive exploration and I found so much virgin cave there. To join these two caves together and to expand the Peacock System was an extraordinary experience.

Like James said, the amount of fossil remains in the cave is impressive and there is much archaeological material around Baptizing Spring itself. It is a fascinating system on so many levels. Baptizing Spring has this rich history dating all the way back to the Timucuan



Indians and the Spanish invasion in the 17th century. Then there is the hydrology, there are still many mysteries surrounding the water flow around Peacock. To find this huge amount of new cave and reveal one more little piece of the puzzle is really great. But some bits of the cave are indeed low and muddy. The whole Peacock to Baptizing run is an advanced sidemount cave dive and while not off limits certainly requires good gas management and a love of tight places, thick silt and zero vis.

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NATIONAL DIRECTOR'S REPORT

STEVE TREWAVAS



On Feb 27, 2011 an incident occurred at Tank Cave where tragically a well-known member of the CDAA, Agnes Milowka lost her life. 'Ag' was a most passionate explorer of the phreatic world, full of enthusiasm for the sport of cave diving and intent on living life to the fullest. Her numerous contributions to this magazine, our website and cave diving globally, have impacted positively on our sport. Her infectious laughter and cheeky wit bring a smile to my face each time I reflect. For those of you wishing to understand and capture an explorers' passion, a visit to Ag's website www.agnesmilowka.com This issue contains two articles by Agnes, submitted just prior to her death. A fitting tribute and insight into a beautiful person, whom our tight knit community will significantly miss. Our thoughts are with her friends and family at this tragic time.

There have been a few recent changes to the CDAA including a new fresh website revamp. Our IT manager Damien Georgiou has been working tirelessly and I feel the results are both visually aesthetic and practical from a behind the scenes member management viewpoint. We finally have a database that is updateable by members and CDAA staff and more importantly talks to our card printer, which should speed up our membership processing.

In the near future all course bookings and materials purchased will be co-ordinated through our website. I would encourage members to visit the site regularly as notices and information updates are regularly posted there on the Directors or State Rep forums. For those more technically minded RSS feeds are available ensuring important tagged areas send notifications to your email address.

Jason Caldwell resigned in January as our Publications Director. Unless they have stood in their shoes, few people can understand the pressures and level of responsibility thrust upon people in the volunteer roles within a sporting club. Jason has worked efficiently and proudly on behalf of the members, in the role, for a period of 15 months. I would like to thank him

for his efforts, opinions and decisions which have improved the CDAA. At this point we have not appointed a new Publications Director. Those interested in this role please contact me. A new Publications Director will be announced in April and will fulfill that role until the AGM elections in October.

Rick Nash has been appointed as the new records officer. Thanks to the outgoing officers Nicole Johnson and Rob Lee for their efforts over the past 12 months.

We are seeking volunteers to act as moderators of the website forum. If you are interested please drop the webmaster a line. Thanks to Lachlan Ellis and Adam Hair for their efforts on what is a challenging role. To this end I want to make mention of Matt Skinner who has worked fairly in this important area for a considerable period of time. The forum rules are strict but I am fully supportive of the parameters defined in order to get constructive feedback and advice civilly from the membership.

The 3D movie Sanctum has hit our screens and although it may not technically depict cave diving as we know it, I am sure it will be well received by extreme sports lovers. Congratulations to John Garvin (writer) and Andrew Wight (Director) both CDAA members. The following members were involved in the filming and/or production of the movie in no particular order:

Peter Horne, John Della Zuanna, Agnes Milowka, Richard Harris, Mischa Temple, Liz Rogers, Grant Pearce, Rick Grundy and Simon Christidis.

By the time this edition goes to print Oztec will be right in our lap. Arguably, Oztec is the premier technical dive show in the world. The success of David Strike's Oztec conference format has been adopted by Eurotec and is now delivered to Europe as a successful show. Something we should be proud as an organization to support. Thanks to those members of the CDAA who were presenters at the show and I trust will represent us well, within the Technical diving community.

Steve Trewavas.

SITE DIRECTOR'S REPORT

ROB BRENNAN



Hi all...

By the time this issue has gone to print, the final contracts for the sale of Tank Cave will be very close to completion. There had been a few issues with the wording of the new lease for Kilsby's cave. This had caused the site to be closed until all parties were satisfied with the contents of the lease. The lease was finally signed on the 3rd of March and the site will re-open for diving on March 5th and 6th. The Biggest change to the access conditions is that there is now a requirement for 3 divers to be in the water at all times. We will post all changes to access and diving conditions on the website.

Congratulations to all members who were involved in the making of the film Sanctum. It is a typical Hollywood style film – lots of action and drama. The underwater scenes are spectacular and worth the admission price alone.

We have also been in talks with the Ashbys regarding a lease on the Shaft. While this has taken a bit of a 'backseat' while other negotiations have been taking place it is still on our

agenda to address. More details will follow as they come to hand.

Oztek will be held in Sydney on the weekend of March 12 & 13. It will be an awesome event with some of the CDAA members as guest speakers. These speakers enhance our standing within the technical diving fraternity. Should you get the opportunity, make sure you attend at least 1 day of this conference. The CDAA have a stand at the show which will be manned by volunteers and some of the current directors.

Divers have been able to access Bakers Cave again. We will be looking for a volunteer to work as Site Access Officer for this site. Please let me know if you are interested.

As we progress and push the limits of our sport further and further, I feel the need to remind all of you of your obligations towards the cave diving community and the landowners. Please respect the rules and regulations that have been placed upon us, and dive within these boundaries.

Safe Diving, Rob Brennan

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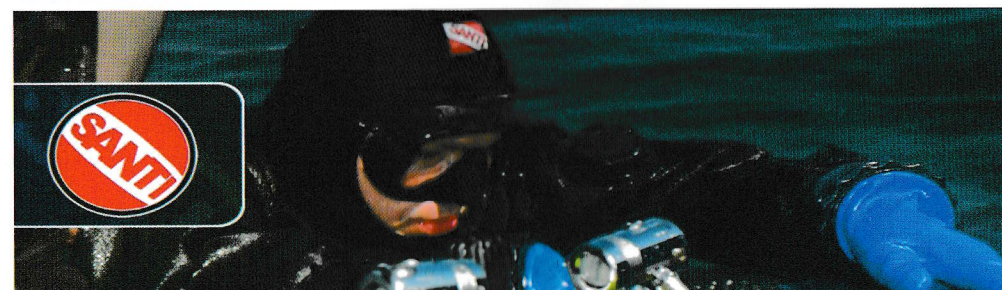
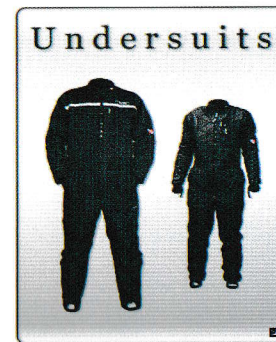
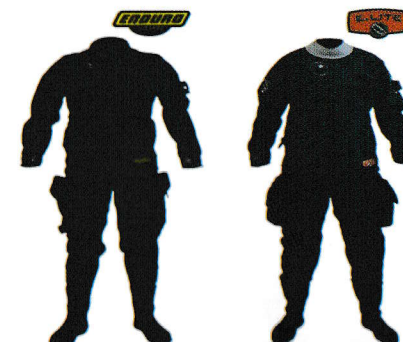
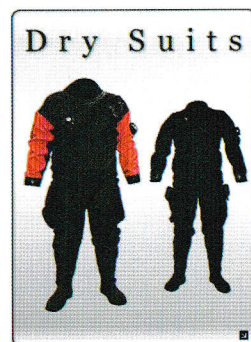
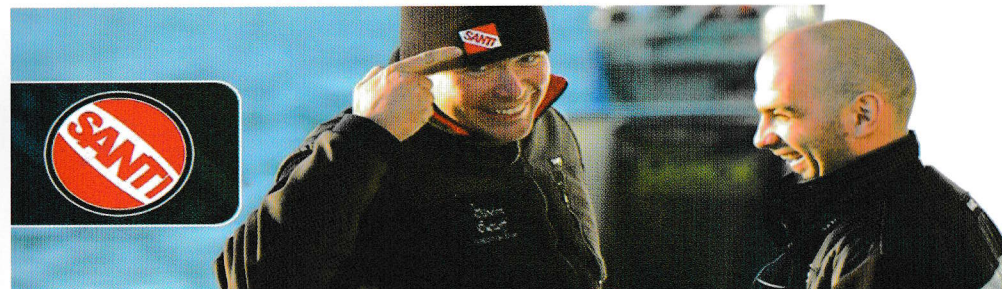
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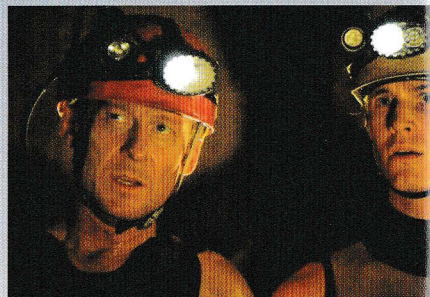
Movie making magic:

It's not difficult to imagine why someone would want to make a movie about cave diving. Inside a cave system the line between life and death is a fine one, which naturally makes for a thrilling adventure or in this case a thriller of a movie.



'Sanctum' the movie, a James Cameron 3D extravaganza, was released in the cinemas in February. Sanctum is a movie about cave divers and the thrill of exploration and adventure inside cave systems. It investigates the psychological strains on team members of an expedition which all goes horribly wrong. The basic plot is a bunch of cave divers who get stuck in a cave due to a torrential downpour and the only way out is to delve further into the cave system in the hope of finding an alternative exit. They fight raging water, deadly terrain and creeping panic as they search for an unknown escape route to the sea. Too dramatic... too Hollywood I hear you say. Well, I have to disagree with you. Underwater, inside caves, whatever can go wrong often does go wrong, and when it all goes pear shaped, it does so in a most spectacular fashion. The room for error is small indeed when it comes to cave diving and a serious mistake can cost you your life. We as cave divers all like to think that cave diving is a safe sport and that nothing will harm us down there but the reality isn't quite so rosy. A lot can go wrong underwater and inside a cave. We tend to assume that if we follow the cave diving rules, grab three of everything and get proper training we will be saved from certain demise. Indeed, a diver with proper cave training and the right equipment has much better chances for survival than an open water diver who ventures into the underwater cave environment with little to no idea of the hazards. But cave diving is not the same as going for a walk in the park, there are risks involved and if you for one second think that you are completely safe, you are in complete and total denial and an accident waiting to happen. Any of the cave divers involved in the making of the movie (Dave Apperley, John Garvin, Barry Holland, Richard 'Harry' Harris, Phill Short, Jason Blackwell and Agnes Milowka) can reel off stories of close calls and misadventure when diving inside caves. Perhaps none are more spectacular and definitive however, than Andrew Wight's experience

It also meant that as a stunt diver I could sit around and look pretty while they did all the work, bonus!



SANCTUM the movie

Review by Agnes Milowka

out in the Australian Nullarbor Plains in 1988. Andrew was part of a team exploring Pannikin Plains Cave when a freak storm caused the cave to collapse trapping 13 people. The Nullarbor is an arid, desert like environment and yet on that faithful day the storm was so severe it dumped a year's worth of rain in just 20 minutes. The cave acted as a drain and all that water poured into the hole and caused the cave entrance to collapse. Thousands of pounds of rubble descended on the team and they lost a whole lot of gear that was buried underneath the avalanche, but miraculously no one was hurt. Eventually, after a couple of days the team was able to dig their way out – they were extremely lucky. It is no surprise that the experience has left a lasting impression on Andrew Wight and as such, it is not surprising that he was the producer of the Sanctum movie.

The 'Sanctum' story was written by John Garvin and Andrew Wight. Both writers are cave divers and they have experienced first-hand both the ecstasy of cave exploration and the very real dangers that exist whilst pursuing this activity. Obviously there would be no movie if everything on the expedition went smoothly and according to plan, there is an emphasis on all the things that could go wrong. It is worth noting though that the hazards experienced by the characters in the movie have not been plucked from mid air, the hazards are real! Getting trapped inside a cave is probably many people's worst nightmare; no matter how you look at it, it is not an appealing concept. In the case of 'Sanctum', once the dive team is trapped, what

then? Well, sometimes you just have one of those days. The characters of the movie have to push themselves beyond the limits of endurance in order to survive. When things go wrong in cave diving, they go dramatically wrong. We all know about the snowball effect; what starts out as a series of small problems can often snowball into a more serious and catastrophic problem if left unchecked. In diving accidents it is never just one thing that gets you, it is often a number of consecutive small errors that eventually leads to your demise. The movie stays true to this idea and the characters that make mistakes and take risks tend to pay the ultimate price. 'Sanctum' flies by at a phenomenal speed and it is non-stop action all the way through. There is hardly

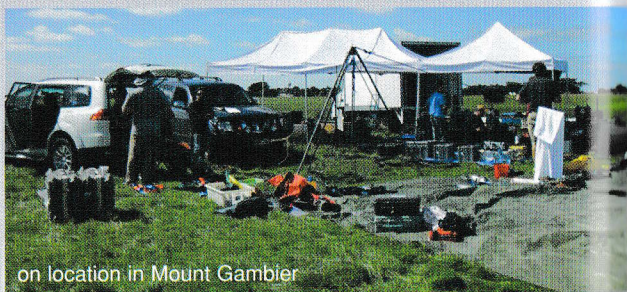




enough time to relax and take in a breath between all the action and the drama. The movie delivers the kind of energy and shots of adrenalin that is fitting when telling a story about one of the most exciting and extreme disciplines in the world - cave exploration. Yet, to its credit the actual essence of the story rings true on a number of levels and stays real and down to earth. The movie is engaging because it is a story about people, how they relate to each other under trying and stressful conditions and the psychology of being trapped underground and facing a seemingly hopeless situation.

'Sanctum' gives a glimpse into the psyche of the explorer and what drives them to keep pushing in such hostile environments. It tries to share the joy of exploration and the thrill of finding new cave passage. The idea that you can go around the corner and enter an unknown world and see a place no one has ever seen before... I think that appeals to the explorer in each of us. The phenomenal thing is this kind of exploration is still possible today! 'Sanctum' is one hell of a ride and in my book is the best movie about caves out there. It was an amazing experience to be a part of it and to see it all come together. The amount

of time, dedication and effort that goes into this kind of production cannot be underestimated. It is worth noting that working on a big production movie isn't all gloss and glamour, it is actually hard work. It took over a month and countless hours in the water to shoot all the underwater scenes of the movie. Twelve hour days, night shoots, constant immersion - it was definitely not a holiday. My favourite part of watching the movie was actually seeing it all come together on the big screen. I love what Alister Grierson, the director, did with the story - I really enjoyed watching his vision. It captures the world of cave exploration brilliantly - the personalities involved, the potential conflicts, the pleasure, the pain, the difficulties, the splendour and finally and most importantly the feeling of hope. Sure, I would have done it differently, but I'm no hot shot director. Watching my world through his eyes was an interesting experience. The actors (Richard Roxburgh, Ioan Gruffudd, Alice Parkinson, Rhys Wakefield, Dan Whylie and Allison Cratchley) did a fantastic job, not just because they captured the spirit of the characters so well but also because they actually did the diving. There are no tricks in this movie, the actors were underwater and they were diving! When you see

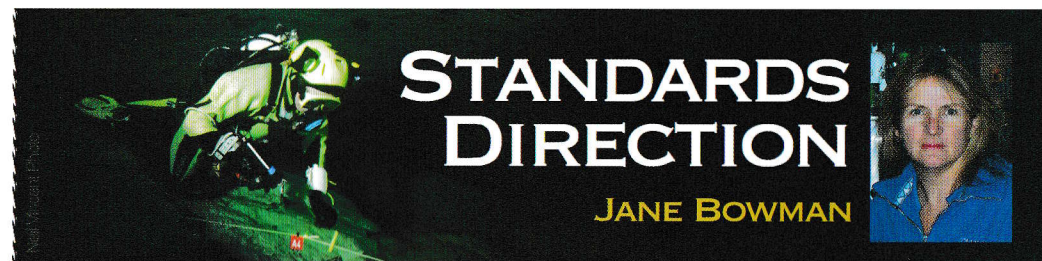
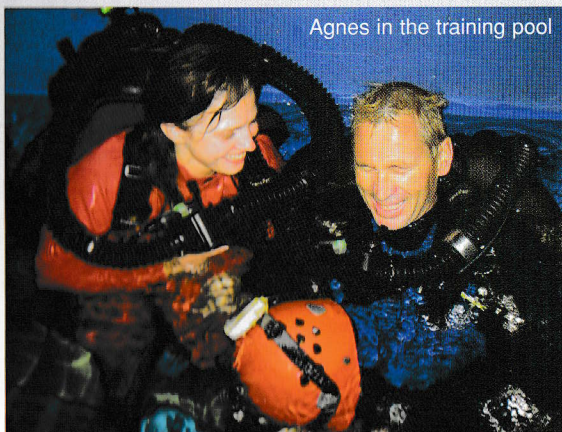


on location in Mount Gambier

the character Frank MacGuire squeezing through tight restrictions pushing his Sentinel rebreather in front of him, well that really is Richard Roxburgh doing all the work. It was incredible what the actors managed to do in such a short period of time. They went from having zero diving experience to diving rebreathers, carrying stages and riding scooters, which is quite amazing. It is a testament to John Garvin and Jason Blackwell (Dive Dive Dive) and their excellent teaching skills as well as the pluck and fearlessness of the actors. This level of involvement and dedication from the actors is obvious when watching the movie and it adds that little extra to the experience. It also meant that as a stunt diver I could sit around and look pretty while they did all the work, bonus!

It was fantastic to see a little bit of our own Mount Gambier in the movie and so many of the local Aussie cave divers involved in its creation. Let's hope they make 'Sanctum' 2 and next time we'll get to go out to the Nullarbor!

Agnes in the training pool



STANDARDS DIRECTION

JANE BOWMAN

There has been much talk of late about the Advanced Cave (AC) Program, and if it teaches skills, or if you are supposed to already know what to do and how to do them.

A number of years ago we changed the name from AC Course to AC Program as there are a number of skills that we expect divers to already have sorted by the time they present themselves for the Program.

These include such things as exemplary buoyancy control and trim, the ability to share gas via a 2m hose as well as buddy breathe, manifold shutdown and valve drills or equal decanting and regulator switching if using independents or sidemounts, efficient use of a reel and good line laying techniques, no mask swimming, use of stages and so on.

There are some skills that we actively teach at AC level - an advanced line cutting method, lost line searches, working with permanent lines, use of jump/gap spools/reels and line marking with personal and directional markers.

So, how do you prepare for the Program? Perhaps work with a qualified AC diver to see what they think of your abilities, or maybe you could get together with an Instructor who could run a training session for you. Apart from these possibilities, it's a good idea to get out and practice, practice, practice.

The 'proposed' Cave Course power point presentation, student notes, exam and instructor notes have been sent to all current Instructors for comment over the month, and hopefully it will be ready to be implemented soon after.

With the changes to the course, there will be period where some students going on to Advanced Cave won't have learnt certain skills, so we may introduce an AC preliminary program to bridge the gap.

We have a number of highly qualified and experienced Instructors that are available to assist with any queries you may have about courses and programs through the CDAA. Don't hesitate to ask!

Safe diving and see you at OzTek,

Jane Bowman

CDAA Standards Director., CDAA Advanced Cave Co-ordinator
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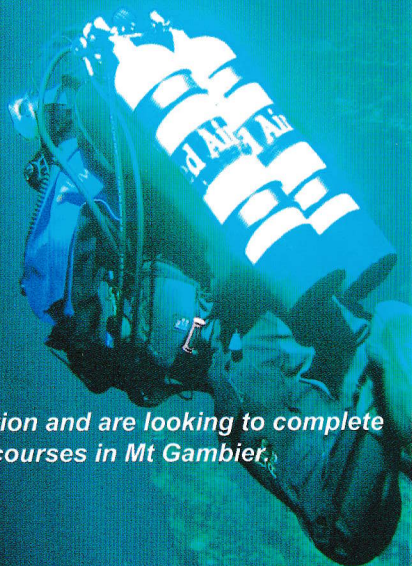
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Tuna Hästeberg:

Swedish Mine Diving

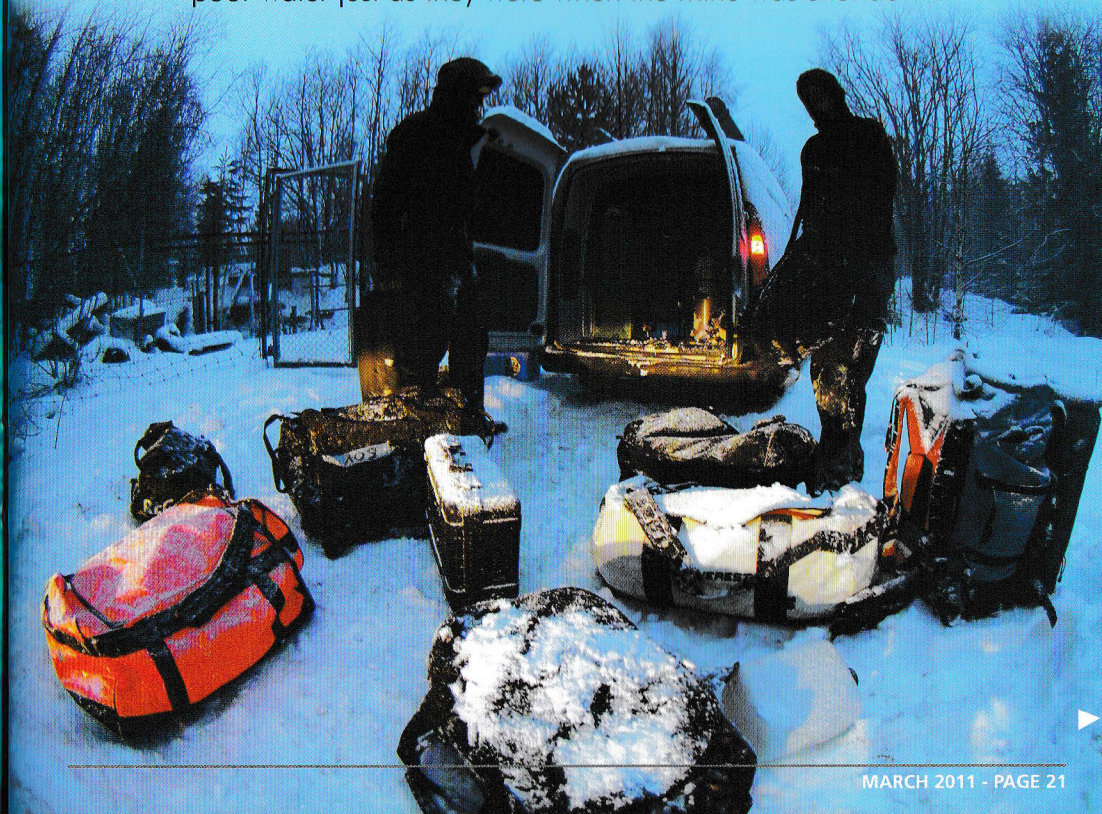
By Dmitri Gorski. Photos by Nicklas Myrin and Daniel Karlsson

Only a couple of hours from the Swedish capital, Stockholm, there is an enormous system of water-filled passages.

The passages number tens of kilometers in total length in all directions. The system is known as Tuna-Hästberg's Mine and, in contrast to many other underwater systems, was created by men. The visibility is total – crystal clear mine water allows you to see as far as your light can shine. And there is a lot to see!

Many of the artifacts that came into the mine, together with the people who worked there, are still in place. Two ore wagons have been discovered, one of them can still roll in its tracks.

Old buildings, tools that lay out in the open near construction sites, lighting – everything is still there. Different structures such as bridges, stairs and fences with doors have been preserved by the oxygen-poor water just as they were when the mine was shut down.



Operational since the 15th Century

Mining in Tuna-Hästberg has been carried out for a long time. First records date back to the early 15th century when mining was done in a small scale by the landowners themselves.

The ore in Tuna-Hästberg is a manganese-rich iron ore and mining started in a full scale in the 19th century. It was, however, in the 20th century that the mine reached its present size occupying more than 47 hectares of territory.

The mine was operational until 1968 when it was shut down.

As it is the case with all mines that are abandoned, the ground water began to rise as soon as the bilge pumps, that were constantly running to transport the water away, were shut down. Today, most of the mine is filled with water. The water level lies at -85 meters below ground level – the last dry level is at -80 meters.

The valuable iron ore veins were at a 30-45 degree angle and this is reflected in how the mine looks today, with many sloping and angled passages. Deeper down it levels out to reach a maximum water depth of about 400 metres, unfortunately inaccessible to divers. Happily this is not a big issue since there are more than 10 kilometers of water-filled passages which can be explored only using Nitrox.

Enormous system of water-filled passages

You can swim into 50 year old electrical power distribution stations and find light bulbs still in their cradles up in the roof and the enamel sign outside will tell you exactly where you are. In a distant part of the mine there is a superbly preserved pump station from the 19th century, the only one of its kind that is known to still exist today. The feeling you get when you dive here compared to diving caves is like the feeling you get diving wrecks compared to diving reefs. Thousands of artifacts & signs of human activity, some hundreds of years old, make each dive a new and exciting experience, a journey in history back to when the mine was an integral and living part of the society around it. More than four kilometers of permanent cave lines are installed in the mine today and it is only a small part of what there is to explore. The lines form a single network with permanent markings and all new lines are carefully documented and stored digitally. Diving ranges from shallow experience dives in the cavern zone to deep exploration with scooters and staged decompression. Maximum depth according to blueprints is about 400 meters!

"I imagine the scene enacted here many hundreds of years ago, and the mining room that I now light up with my powerful HID-light becomes once again filled with dirty workers and hundreds of torches that produce smoke and yellowish light".

A short dive gave a taste for more!

Nicklas Myrin and Daniel Karlsson from Baggbodykarna started to explore the Tuna-Hästbergs mine back in 1998. In the beginning it was all about dry exploration, but down at the third level they were met by water. At once, they decided to try to dive there – but it took over three years before these plans became reality. At the beginning of 2001 it was decided that a test dive would be made. No infrastructure existed for bringing equipment down into the mine and to the water level through a labyrinth of passages. Two lightweight diving rigs were brought down using ropes and the first dive was conducted in the cavern zone in one of the big rooms. A short and easy dive gave much taste for more underwater exploration! The visibility was exceptional, but it was not all. The first thing that met the divers when they submerged was a six meter high wooden bridge. The bridge originated from the time when the ore was transported in waggons back to the elevators and up to the surface. The wooden structure of the bridge was perfectly preserved in the mine water and a whole new world opened up for the divers.

After each dive, we leave our dive gear on the floating platform and climb some five meters up the dive ladder to a room equipped with heating, benches and a table. There we also have everything to cook food, which is simple and rich in energy. It is needed. The days are filled with physical activities. The heated room is a place to relax, share experiences from the last dive and to discuss future exploration plans. There is always something to build or repair, so the evenings are usually spent working. Plans for the future are to make the mine more hospitable so that more and more people can visit it and with their own eyes see that when it comes to overhead diving, Sweden can sometimes be on the same level as France, Mexico and Florida.

"Many of the dives in Tuna Hästberg's mine are like that, a journey into history that is preserved in hundreds of details and artifacts you meet on every dive".

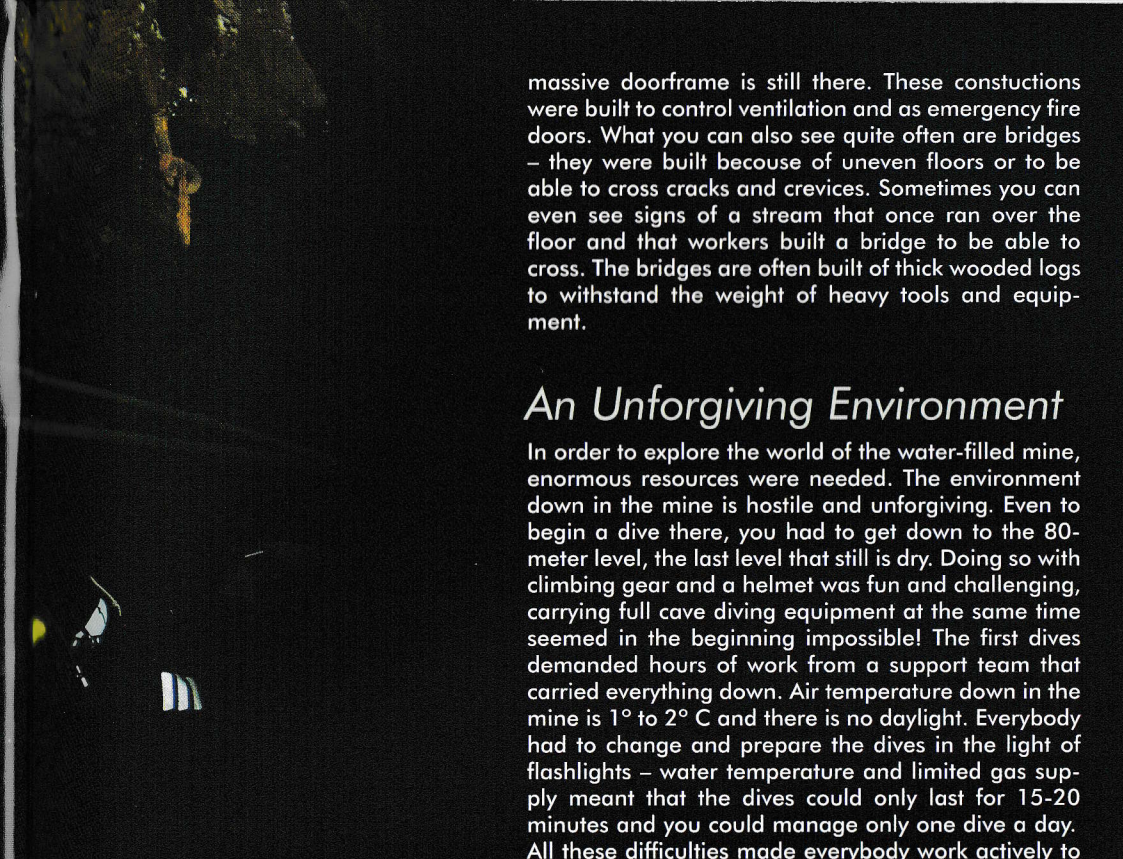


The room is full of dials and mechanisms...

The history of the mine also dates back to newer periods! One of the lines that branches from the main junction near the floating bridge leads directly down to a drop-off some hundred meters away. There, it suddenly goes over the edge and drops down a shaft from 25 to 40 meters to a complicated 5-way line junction, a leftover from early exploration of the mine. One of the lines coming from there guides the diver along a narrow side-passage which reaches the same shaft down which we enter the mine today, but 40 meters deeper. It is here that you can find the famous "Östra-Västra" sign. It sits on a steel fence that surrounds the main shaft. If you swim further you can enter an old control room. The whole room is filled with dials and old mechanisms, probably used to control the elevators in the shaft. In the middle there is a hole leading down to a service tunnel. This room is a witness to a more modern mine operation where a lot of the manual labour was replaced by

machines run on compressed air supplied from the surface. Under the roof you can see rows of light bulbs that lit up the mine in the 20th century.

One of the coolest things you can find in a mine are all the ladders and stairs! They are everywhere – all mines are three-dimensional with many levels. How the stairs are constructed can tell a lot about which epoch they come from. The earliest ones are just round poles bound together by rope. Later, rope was replaced by iron nails and brackets and the stairs became more robust. For many hundreds of years, the stairs were the only way for the workers to reach the surface – the elevators were only there to transport the iron ore. When I once visited the dry Falun copper mine during a work conference, the guide told us why torches in the mines looked the way they did – with a small stick attached to the side of each torch. When two mine workers met on a ladder, one of them had to climb round to the



massive doorframe is still there. These constructions were built to control ventilation and as emergency fire doors. What you can also see quite often are bridges – they were built because of uneven floors or to be able to cross cracks and crevices. Sometimes you can even see signs of a stream that once ran over the floor and that workers built a bridge to be able to cross. The bridges are often built of thick wooded logs to withstand the weight of heavy tools and equipment.

An Unforgiving Environment

In order to explore the world of the water-filled mine, enormous resources were needed. The environment down in the mine is hostile and unforgiving. Even to begin a dive there, you had to get down to the 80-meter level, the last level that still is dry. Doing so with climbing gear and a helmet was fun and challenging, carrying full cave diving equipment at the same time seemed in the beginning impossible! The first dives demanded hours of work from a support team that carried everything down. Air temperature down in the mine is 1° to 2° C and there is no daylight. Everybody had to change and prepare the dives in the light of flashlights – water temperature and limited gas supply meant that the dives could only last for 15-20 minutes and you could manage only one dive a day. All these difficulties made everybody work actively to find a solution for easier and safer diving. The main shaft, through which the workers came down when the mine was operational, still contained remains of old rails and huge supporting beams. Those beams could be used to secure a new simple stairway. Once it was done, nobody had to use ropes any more to get equipment and divers down. The rails were to create help, too, since they could be used for their original purpose with a home-built wagon. 400 kg of equipment could be delivered down to the 80-metre level with the help of an electrical winch. Between 2005 and 2007 the mine underwent big changes. A transformer station was bought and contract with an electrical company made it possible to install permanent lights in the mine. Base camp, where all diving was conducted from, moved closer to the water and facilities like a floating platform to dive from and a room with heating were built. You could now charge your lights and cook food directly in the base camp.

A lot of effort was invested in safety. Mine diving is potentially risky and the smallest mistake carries possible disaster with it. A communication system was installed, making it possible to redirect cell phone calls from the mine up to the surface. The wooden

Bridges, doors and fences underwater...

In the Tuna-Hästberg`s mine there are a lot of stairs just some hundred meters from the basecamp. In one area, there are four or five stairs that can be explored on the same dive, the longest one measuring some 15-20 meters in length. One of them leads down to an old door with a doorframe. The door itself is almost totally gone, but the

platform and a diving ladder make it possible to quickly get a diver out of the water in case of emergency and carry him or her to the waiting wagon that reaches the surface in a few minutes; all of this when help from above is already on its way. Considerable advances in logistics and safety have made it possible to now explore the mine in a totally different way – with scooters and mixed gas. A habitat for several divers is being built at the -6 meter water level; when it is finished, decompression will be much safer and more pleasant.

200 years later, I hover at the same spot...

It is dark, the air is cold, oppressive and humid – the darkness in the enormous mining room is disturbed by a galaxy of flickering hand-held torches. Hundreds of workers can be seen dimly in their light. Everybody is busy breaking off rocks from the walls and the floor and carrying them to the main shaft where the precious iron ore is taken up to the surface to fuel the Swedish war machine that demands metal. Down here, in cold and darkness, one of many streams of raw material is formed. Together with similar streams from Falun, Sala and other places, it is feeding Swedish imperial expansion over large parts of Europe. Mines are one of the most important industries of the time, employing ten's of thousands of people and providing much of the wealth of the country.

In a distant part of the mine it is time for the shift to go up to the surface after weeks of hard work and short cold nights 120 meters down in the ground. Workers gather together in a timbered house and then continue as a group to the main shaft where stairs lead up to the surface where their families are waiting. Tool boxes and other materials are left down in the mine – a hammer falls out from one of the boxes and lands under a pile of rubbish. Almost two hundred years later, I hover at the same spot, near the remains of the timbered house. Cave line, showing the way out, disappears into the darkness behind one of its corners. I look down and see a hammer shaft that sticks out from under a pile of logs which look like firewood. Nicklas Myrin, my dive buddy, beckons with his light and points to a spot further away near a wall. There, I can see two

tool boxes that look as though somebody left them there yesterday! I move over there with a light stroke of my fins, the line is just a couple of meters from me. In the tool boxes I can see a couple of rusty metal bars that were used to anchor the roof supporting beams in the mine. I imagine the scene enacted here many hundreds of years ago, and the mining room that I now light up with my powerful HID-light becomes once again filled with dirty workers and hundreds of torches that produce smoke and yellowish light.

I'd heard Nicklas and Daniel tell about the hammer and the tool boxes before, but couldn't find them myself from their description. On that dive, Nicklas came with me to show me the place and the dive became a journey in history back to the days when Sweden was a superpower. Many of the dives in Tuna-Hästberg's mine are like that, a journey into history that is preserved in hundreds of details and artifacts you meet on every dive. After checking out the tool boxes that are located maybe 120 meters from the entrance, we did a pretty long circuit to come back to a line junction that we first met 5 minutes into our dive. From there it did not take long until we could see the powerful blueish light from a stationary HID-array over the base camp. The light disappeared for a split second, shadowed by a pillar supporting the roof that we swam behind, and then we could see it again, much closer. We passed a restriction and entered the enormous cavern zone under the floating bridge where all diving starts. At a distance of 30 meters, we could clearly see the underside of the bridge and small silhouettes of a team of divers who had just entered the water to begin their dive. On our way up we soon reached the metal bar at six meters where we left our decompression bottles with oxygen. The mine is an unforgiving environment and all dives are conducted with wide safety margin – I usually always finish up with a couple of minutes on oxygen, even when I do not break the no-decompression limit.



THE BUSINESS END OF THE CDAA

ANDREW CRONAN



Hello and thanks for reading, there are three topics for this issue, an update on the Tank Cave purchase, a brief on OZTEK and a new venue for the next AGM.

The Tank cave purchase is continuing, we are approaching the exchange of contracts, only one last document to be registered.

Hopefully by the time you read this we will have a firm settlement date. Once we have exchanged contracts we will be recalling the management committee and fleshing out details for the day-to-day operation of the site and establish a medium and long term strategy for the cave.

The commercial aspects of sites continues to be a significant body of work for the association, as lease are coming up for renewal there is an increasing focus being paid to the arrangements by the landowners and their legal advisors. Please remember that often these negotiations are influenced directly by our behaviour and discussions with the landowners or their representatives.

It is time for OZTEK, please visit, the association will have a stand there, the directors will be available over the weekend, please come by and say hi. It's a great opportunity to purchase some product, have a chat or watch

some of the videos / photos that we will be displaying. David has taken good care of the association so please support OZTEK, it's a great opportunity to catch up with old and new friends and hear some great people talking about some truly inspirational diving. There has been a number of discussions on the website regarding trying a new venue for the AGM. This year we are going to hold the AGM in Melbourne, I want to gauge the attendance and see how we can maximize the attendance of members. Being from Sydney I understand how distance can be a barrier but as most of our members are from VIC we should get a good gauge of interest for a capital city model. I'm also exploring how we could sync our AGM to OZTEK in alternate years to reduce our cost, increase availability to members and improve the association's profile. We are exploring locations and will have a suitable venue in the next few months.

Like all of us I am shaken by the tragedy on the weekend and the loss of one of our own. Please dive safe.

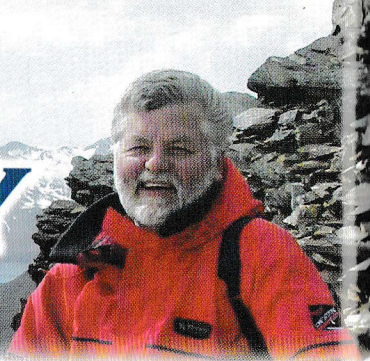
Andrew Cronan
Business Director

• Articles for Guidelines •

- **Send articles by email or on disc in the mail!**
- Email to publications@cavedivers.com.au and seapicsdavebryant@gmail.com
- Text files should be saved as Word files or Simple Text and pictures as separate jpeg files. If mailing please send jpegs and text on a disc to PO Box 2198 Rosebud 3939 Victoria.
- Pictures saved from digital camera or scanned from photos must be at least 200-300 dpi at 15cm wide, RGB files, and saved as Maximum Quality JPEG's, or Tiffs if mailing.

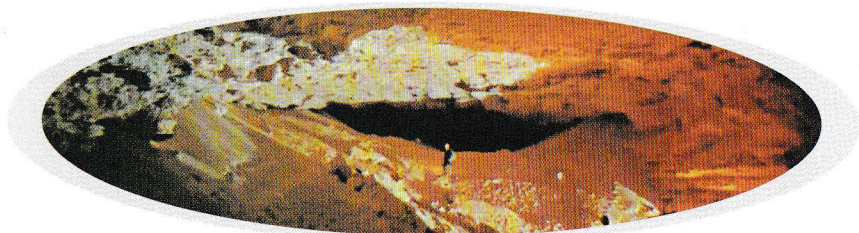
KARST GEOLOGY

WITH IAN D. LEWIS



Mullamullang Cave Nullarbor Plain

Spotting large caves on the Nullarbor Plain



The Nullarbor Plain is one of the largest continuous sheets of limestone in the world. Large caves like Weebubbie, Koonalda and Cocklebiddy were discovered by settlers by the mid-1800's and were vital water sources for the early pastoral stations. It wasn't until aerial photography that many more caves were discovered. From the 1920's to the 1950's, a colorful character named Captain J Maitland Thomson used Tiger Moth biplanes to spot about 50 caves on the South Australian side of the border including the three Murrawijinie Caves (see photo of one of the entrances), which they then went out and explored. All the caves he spotted were shallow dry ones. I met him a number of times in his later years and we have his cave and early photographic records.

Nowadays over 5000 cave, blowholes, rockholes and other cave-related features are currently recorded across the Nullarbor Plain and this has hardly scratched the surface, so to speak! Many of these have now been spotted by flying Ultralites. 80 cave entrances alone have been plotted from a fixed-wing aircraft flight along the southern cliffline between Eucla and the Head of the Bight. To my knowledge, no such flight has yet been made along the cliffed coastline south of Cocklebiddy at Twilight Cove going westwards. A number of these 80 entrances are large and clearly lead to big systems. We can't tell yet if these sea cliff caves go down to water. You could only get to them by abseiling from the top or access from the sea – what a boat trip that will be!

When aerial photography became more available as mineral prospecting expanded in the 1950's and 1960's, cavers scoured the Nullarbor air photos for more large cave entrances of sink-hole-size like the Weebubbie entrance. They found to their delight a whole series of them on the Western Australian side of the border north of Madura. In a series of expeditions including two

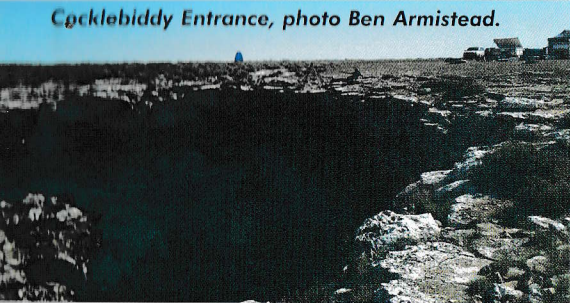


100m limestone cliffs at the edge of the Plain.
Photo Fred Elliot



The Dune, Mullamullang Cave.
Ian took this photo using a 100 watt flash bulb.

Cocklebiddy Entrance, photo Ben Armistead.



really big ones in 1963 and 1966, cavers discovered another 150 caves including Murra-El-Elevyn, Tommy Graham's and Pannikin Plains, all of which were left for cave divers to explore and map in the 1970's, and the mighty Mullamullang Cave. This article is about Mullamullang Cave and its diving exploration prospects there.

Large Nullarbor Cave systems

Of all the Nullarbor caves, three are significantly longer than all the others – Cocklebiddy Cave (7kms), Old Homestead Cave (30kms) and Mullamullang Cave (8kms). They are also geologically quite different from each other. I find this is significant because it indicates that large caves under the Nullarbor can form in different ways, so we are not just looking for one style of cave in the ongoing searches.



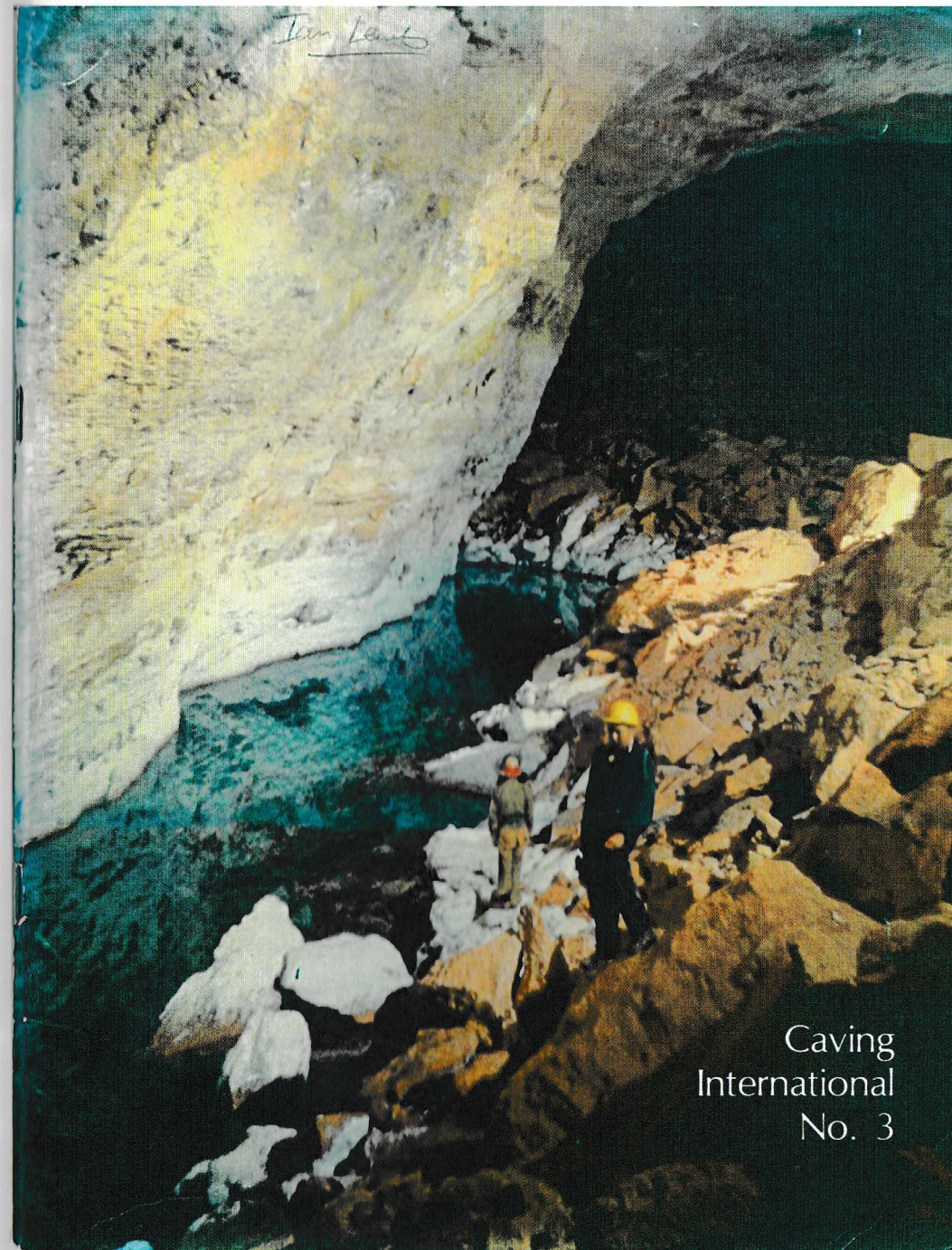
Murrawijinie No. 2 Cave, entrance and Saltbush Plain in background. Photo Jim Cundy

Cocklebiddy Cave

Cocklebiddy runs along what appears to be a single faultline heading north for about 100kms. The original faultline is in the hard



*Smoke Junction, Mullamullang Cave.
Photo taken by Ian, using magnesium burner.*

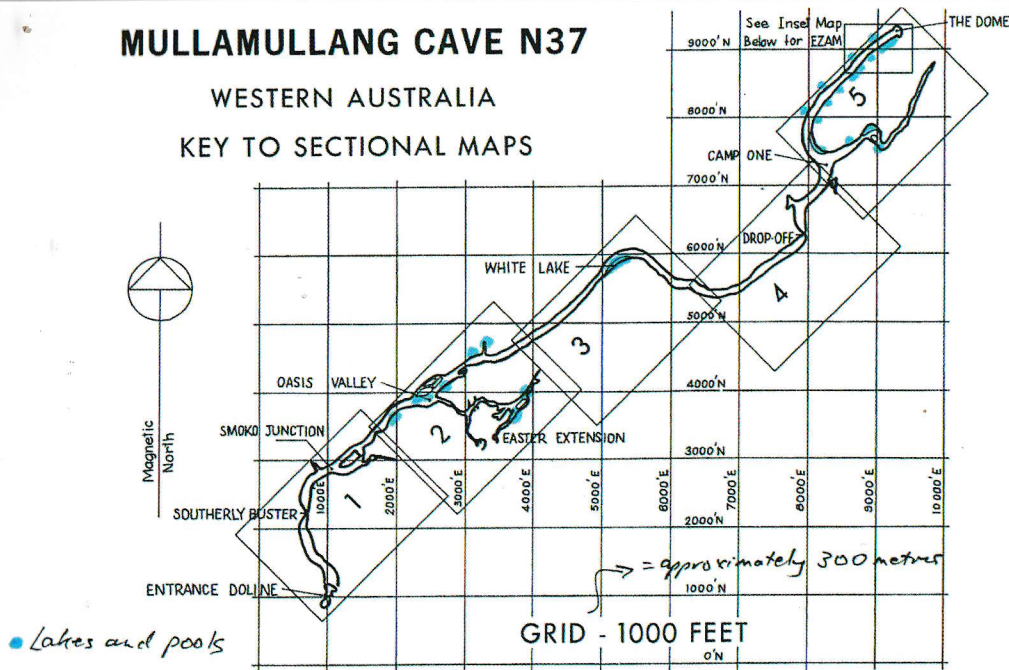


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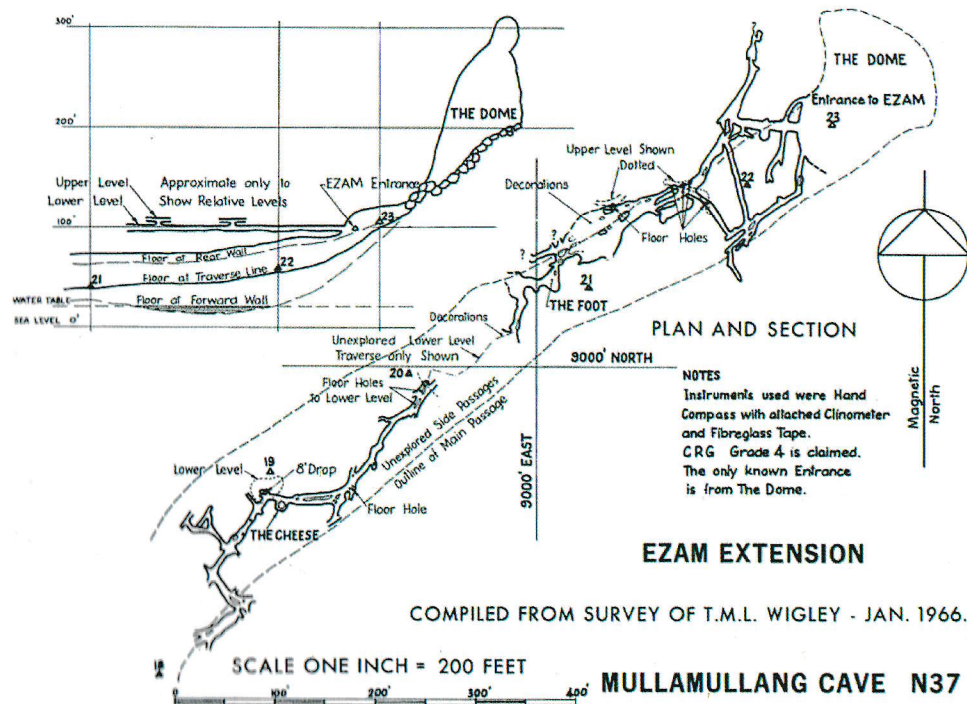
This was the Front Cover of an International Caving journal in which Ian had the lead article, soon after the early Nullarbor discoveries. The other photos in this article are from a middle spread from the same publication.

MULLAMULLANG CAVE N37

WESTERN AUSTRALIA
KEY TO SECTIONAL MAPS



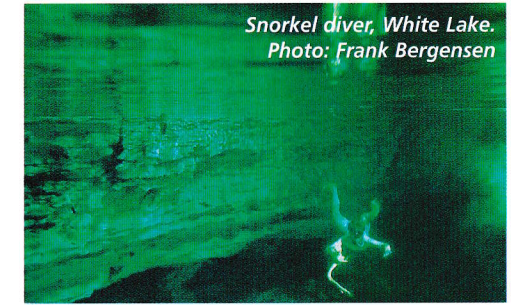
• Lakes and pools



basement rocks deep below the limestone there but the weakness has relayed up into the limestone after it was deposited by the sea and water has continued to enlarge Cocklebidy Cave ever since. The water moves slowly southward along underground channels from the edge of the Great Victoria Desert far away to the north. The length of this faultline is such that the prospects for Cocklebidy continuing northwards for a long way seem to be very good. Several attempts have also been made to get through the rubble pile at the southern end of the Cocklebidy entrance valley as the cave will definitely continue southwards via Capstan Cave towards the highway and the coast.

Old Homestead Cave

This cave is a completely dry system but consists of 30 kilometers of highly complex maze systems on multiple levels. Cavers were camping at the top one day when a rainstorm similar to the Pannikin Plains one hit the area and they saw a lake form in the entrance which poured down a series of huge waterfalls from level to level deep into the cave where all the water disappeared into the soil and rock. The cavers had seen one of the main processes which explains why some of the Nullarbor caves are so big, and that they don't just dissolve slowly but can be eroded in a very quick way by these sudden storm events. We didn't realise until the Pannikin

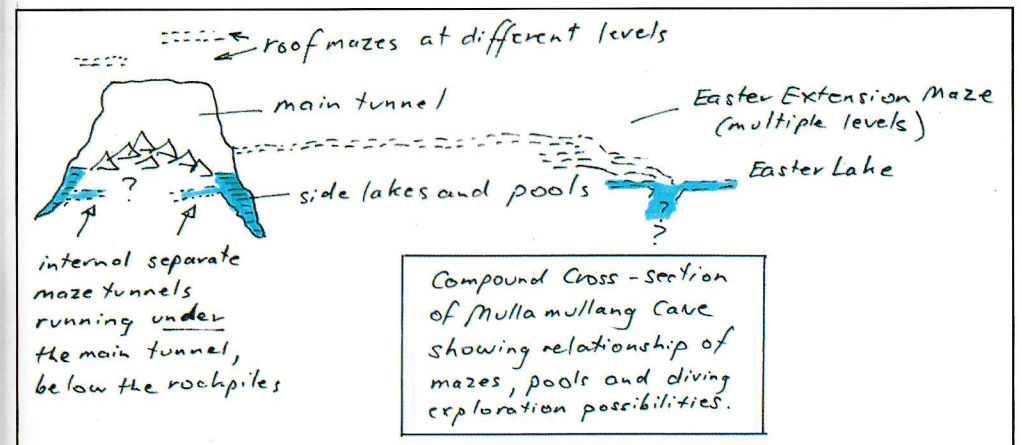


Snorkel diver, White Lake.
Photo: Frank Bergensen

Plain storm just how important this erosion is in cave formation on the Nullarbor. When you think of how many storms have occurred over say the last million years, that's a hell of a lot of force and erosion pouring into giant cave entrances and rearranging tunnels.

Mullamullang Cave

It's the other of the Big Three. It has a vast main tunnel about 4 kms long ending in an abrupt dead end in the huge upward Dome Room (see map). In 1966 a large expedition of cavers camped a long way into Mullamullang at Lake Cigalere and mapped and explored the inner reaches of the cave to the Dome Room and found an extensive maze system running back along the main cave but up above in the roof! They called it the EZAM which is 'Maze' backwards, because that's the way it is running. The maze is significant to a karst geologist because it gives clues of what might be found underwater



elsewhere through the cave. There are another 4 kilometres of maze systems on at least four levels throughout different parts of the cave (see map). It took quite a bit of exploring and surveying to begin to understand what these maze systems are actually doing.

Corners and Bends

Mullamullang Cave is a geological combination of the simple linear tunnel system of Cocklebidy and the complex maze system of Old Homestead Cave. It was given its name "Mulla-mulla-ng" because 'Mulla' means 'red sand' in one of the local aboriginal dialects and to double the word means 'lots of red sand'. This comes from the pinkish limestone which the cave is formed in and can be seen in two of the photos. However, Mullamullang cave differs from Cocklebidy in that it takes a series of major right-angle bends along its main tunnel length. These bends and corners are of particular interest to a cave geologist as you might

remember from my Englebrecht's Cave article last year. The interest is because corners indicate that there are more than one weakness line at that point, which means water can go in other directions at the corner but has most recently continued along the known passageway. So I look closely for other directions where water may have moved and dissolved or eroded passages in the past which may just be blocked by a sand-pile or rockfall (see map).

Lakes and Pools

In Mullamullang Cave there are about 25 lakes and pools where the cave reaches down into the water table. They are not the giant lakes of Weebubbie and Cocklebidy. The largest lake is White Lake (see photo) and the white rock is gypsum and halite - ie salt - which has coated the rocks around the lake level. Many Mullamullang lakes and pools have this effect. It is not easy to see in the photo of me snorkel-diving in White Lake but the underwater walls and ledges of sev-

eral of these lakes are also coated with these minerals in a hard knobby form. They provide wonderful effects for underwater photography but I don't think anyone has tried that yet.

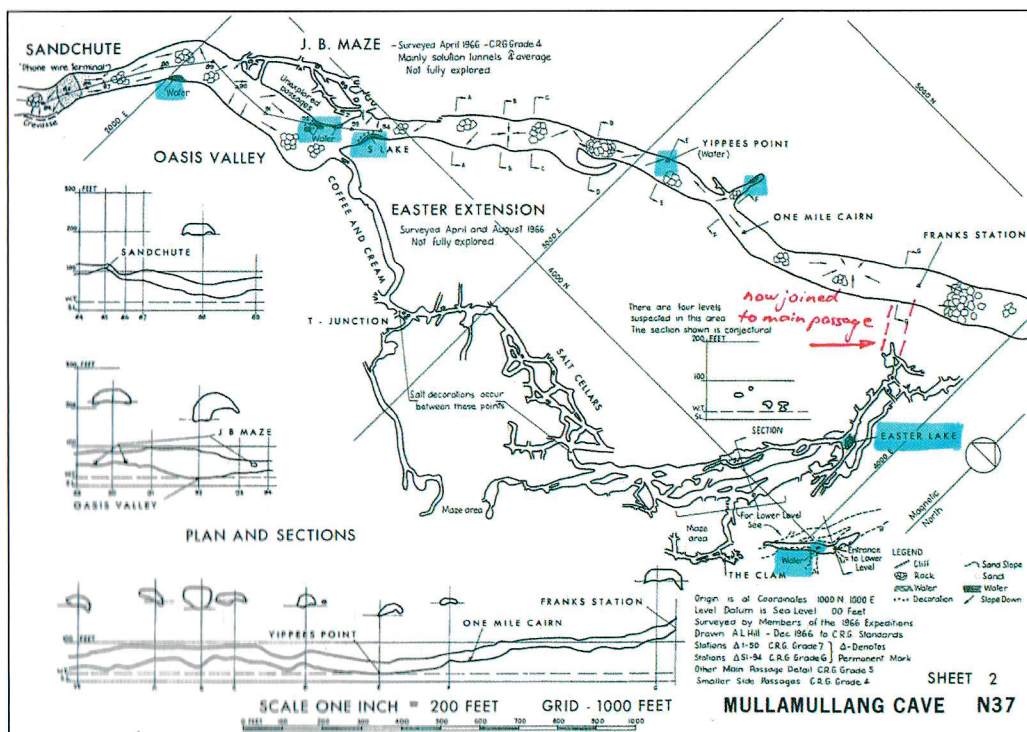
Small Tunnels under Big Tunnels

The point about the lakes and pools in Mullamullang Cave for cave diving exploration is that they don't appear to lead to large lower rooms like the other cave dives in the white limestone. Instead they lead to small maze systems which appear to be exactly like the dry ones up above the roof of the main tunnel (eg The EZAM) or like Easter Extension maze, which is over 3 kms in length and on at least 4 levels, reaching down to water at Easter Lake and a couple of other pools. What is also a real surprise is that the small maze systems leading off the lakes and pools in the main tunnel actually head back under the main passage, not away from it like you would expect, for example as the maze system in Murra-El-Elevyn does! Also, normally,

small passages underneath a big rockpile tunnel would just be gaps between the boulders but these seem to be in solid rock and so are separate maze systems formed by dissolving, not collapse, and are part of the original lower-level old cave which we never knew existed until looking underwater in these lakes. This is just like the EZAM maze, but below the main cave. Therefore these small pools and lakes have potential to lead to reasonable length mazes just like the dry ones.

Easter Lake and Easter Maze

Easter Lake appears to drop into further lower levels and it is easier to get to now as we connected the old known far end of Easter Extension back to the main passage at a point called Frank's Station. There is a big 'E' mark on the wall there above the connection. Luckily this also means avoiding the delicate areas around Coffee & Cream and the Salt Cellars so they can be protected. The representational cross-section



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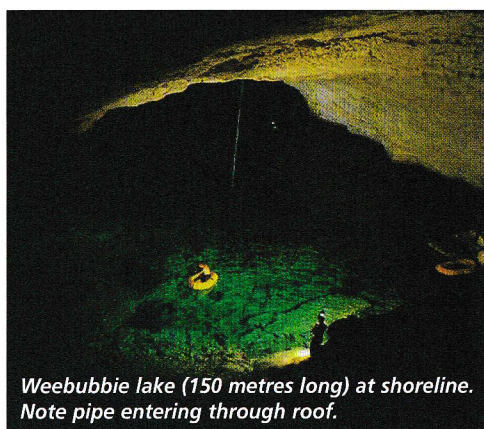
Lot 7, Capirco Rd, Compton (via Mt. Gambier)
PO Box 9286, Mount Gambier West, S.A. 5291

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diagram shows where Easter Lake potential lower levels correspond to possible submerged mazes back in the main cave tunnel. About another 1000 metres of dry mazes in Easter Extension have been discovered and mapped since this old map was done in 1966. When you look at the amount of unknown space surrounding Easter Extension on the general cave map, and the fact that it all fits within a huge 'Bend' of the main cave, that is a big area of great potential for wet and dry discoveries! Mullamullang may have lots of red sand but it could just as well have been named 'Maze-Ezam' Cave for all these discovered and yet-to-be explored forwards-and-backwards, upper-and-lower phreatic passage systems.

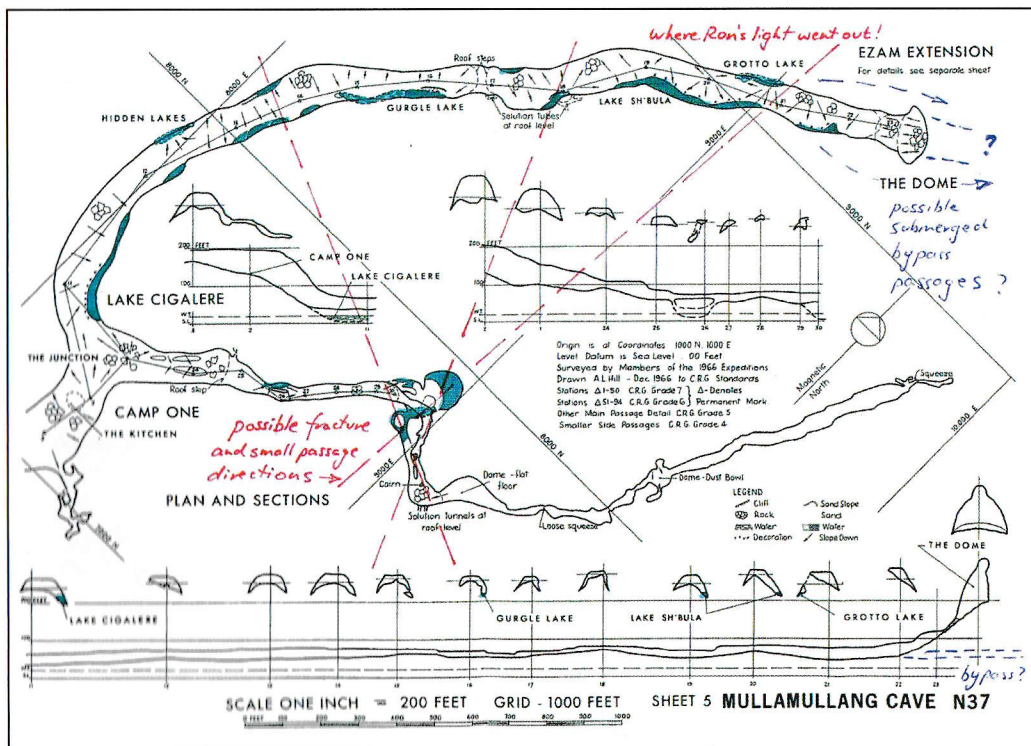
Getting past The Dome!

This becomes particularly important when you look at the array of lakes at the far end of the main cave near the Dome (see map). A couple



Weebubbie lake (150 metres long) at shoreline. Note pipe entering through roof.

of attempts have been made to explore one or two of these end lakes to see if maze tunnels will lead around the below the Dome Room and get past it beneath as the main cave must continue beyond the Dome collapse. I've had a bit of a poke around in one or two of these but was too cold and tired at the time to make much sense of it. I remember Ron Allum diving in one of these



– Grotto lake – with one torch years ago when it died and he had to feel his way back out in the dark! So he never found out whether Grotto Lake had small tunnels leading off it. But the same applies to many of these side pools along the main tunnel. I think some of the NSW cave divers have had a look at some of these more recently also but no-one has systematically put together what we know at present so we can focus our search on the most likely prospects. The other very interesting aspect of diving this end of the cave is the potential for cross-tunnels which I've indicated in red dashed lines on the map. There's a lot of space between those two main passage arms.

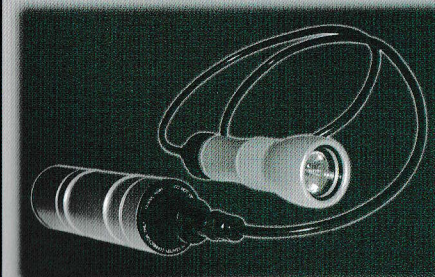
REFERENCES

All maps have been sourced from 'Mullamullang Cave Expeditions 1966', CEGSA Occasional Paper #4, AL Hill (Ed), Adelaide, South Australia, 1966. It is available from CEGSA - (Cave Exploration Group of South Australia). Photos have been sourced from the lead article in 'Caving International' #3', PO Box 4328, Edmonton, Alberta, T6E 4T3, Canada (Editor: Peter Thompson), April 1979, pp 3-10 plus cover and centrespread.

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UPCOMING COURSES

DEEP CAVERN Courses

• Saturday, 2 April 2011 - Sunday, 10 April 2011 • Saturday, 30 April 2011 - Sunday, 8 May 2011
• Saturday, 28 May 2011 - Sunday, 5 June 2011 • Thursday, 28 July 2011 - Tuesday, 2 August 2011
Course includes all theory (12 hours), 3 hour pool session as well as gear critique and land drills in Melbourne. Get everything sorted before you drive over. Mount Gambler 6 dives in Caverns and sinkholes. Will run course with 2 students or more. Contact me to set your own dates if this doesn't suit.
Terri Allen 3483 Mobile: 0419176633 Email: terri.allen@bakeridi.edu.au

• Thursday, 14 April - Monday, 18 April 2011 • Monday, 15 August - Monday, 29 August 2011
• Monday, 5 December - Monday, 19 December 2011

Course includes theory, full gear critique and assistance with modification as well as a 4 hour pool session. This is all completed in Melbourne. Then a 3 day weekend away where you will complete 3 Cavern Dives and 3 Sinkholes in Mt Gambier. Twin Tanks required for all dives.
If dates don't quite suit, arrange 4 of your dive buddies and I can run a course to suit you.
Paul Leslie (3184) Mobile: 0407785591 Email: paul@melbournediving.com.au

CAVE Courses

• Saturday, 2 April 2011 - Sunday, 10 April 2011
2 nights theory and exam. Including use of safety spools, jump reels, line arrows and personal markers. Full manifold use taught.
Terri Allen 3483 Mobile: 0419176633 Email: terri.allen@bakeridi.edu.au

• Saturday, 28 May 2011 - Sunday, 5 June 2011
Course includes 12 hours of theory and exam, inc jumps, arrows, etc in Melbourne before we head to Mount Gambier for 3 days of diving and 6 dives in cavern and cave sites. Course cost around \$590 depending on numbers. Will run with minimum of 2 divers. So grab a buddy and contact me to arrange your own dates.
Terri Allen 3483 Mobile: 0419176633 Email: terri.allen@bakeridi.edu.au

• Monday, 27 June 2011 - Monday, 4 July 2011 • Monday, 14 Nov. - Monday, 21 Nov. 2011
Course includes theory, full gear critique and assistance with modifications including use of Finger Spools, Arrows and Cookies. This is all completed in Melbourne. Then a 3 day weekend away where you will complete 6 Dives including 3 Cave Sites in Mt Gambier. Twin Tanks required for all dives. If dates don't quite suit, arrange 2 to 4 of your dive buddies and I can run a course to suit you including midweek courses.
Midweek courses will be run over 4 days in Mt Gambier.
Paul Leslie (3184) Mobile: 0407785591 Email: paul@melbournediving.com.au

ADVANCED CAVE

• Friday, 22 April 2011 - Tuesday, 26 April 2011
Program conducted entirely in Mt Gambier over 5 consecutive days.
Please pay careful attention to the equipment requirements. An application form can be found in the Downloads section of the web site, and submitted to the Advanced Cave Program Co-ordinator, Jane Bowman (1880). Ph: 0407 566 455. Email: standards@cavedivers.com.au

Please download the latest application form from the website.
www.cavedivers.com.au

CDAA SITE ACCESS - www.cavedivers.com.au

Remember: Access is a privilege, not a right. Please be considerate of landowners wishes.

CN = CAVERN S = SINKHOLE C = CAVE P = PENETRATION

SITE	LEVEL	OWNER	ACCESS DETAILS
MOUNT GAMBIER - SOUTH AUSTRALIA			
DEH SITES			
Evens Ponds	Nil	DEH P.O. Box 1046 Mt Gambier 5290 (08) 8735 1177	Groups of 6 or more, phone/mail to Dept. for Environment & Heritage (DEH) Smaller groups, no need. Fax: (08) 8735 1135
Gouldens	CN	DEH	General Diving: Divers to contact DEH and notify of date and site to be dived. Please make requests by phone or fax only.
2 Sisters	CN	P.O. Box 1046	Divers must have the correct CDAA diving endorsement for the site and carry current
Fossil	C	Mt Gambier 5290 Ph: (08) 8735 1177 Fax: (08) 8735 1135	financial CDAA membership card. The diver must have signed an indemnity with DEH before access is permitted and original copy must be received by DEH prior to diving. Training: The Instructor is to notify DEH of the date the sites are needed and to forward signed indemnities from each student and their temporary card number/ membership number.
Piccaninnie Ponds	S	as above	Permit holders by phone or fax. Be aware of delicate vegetation. \$26/dive or annual Permit \$60. NOTE: Indemnity form to be completed with m'ship renewal & lasts same length as. M'ship.
NOTE: Divers should renew their Piccaninnie Ponds indemnities at least 2 weeks prior to their intended dive date.			
Horse & Cart	CN	Peter Cunningham	By phone or mail, 1 week prior. Ph: (08) 8738 4003.
Tea Tree	CN	PO Box 2168, Mt Gambier 5290	
Little Blue	S	District Council of Grant	Permission not required - must carry card.
Allendale	C	District Council of Grant	Obtain key from Lady Nelson Tourist Information Centre.
Ela Elap	S	Mr. Peter Norman	Visit the house before diving.
One Tree	S		If no one is home - no dive!

FORESTRY SA SITES

Dave's Cave	C	Maximum 3 divers all weekends between May & November inclusive (check and update on CDAA website).
Hells Hole	S	At least 4 divers in group - 1 with previous site experience.
Pines	C/P	Unrestricted days or numbers - Cave rated divers must not enter Penetration sections (stop signs)
Mud Hole	C	Unrestricted days or numbers.
Nettle Bed	P	Open every weekend. Maximum of 4 divers per weekend undertaking 1 dive only (check an update on CDAA website)
Stinging Nettle Cave	P	Open every weekend max 3 divers per day undertaking 1 dive per day (check an update on CDAA website).
Iddlebidy	P	Open every Saturday max 4 divers, 1 dive only (check an update on CDAA website)

Owner: Contact Forestry SA by email: conservationandrecreation@forestrysa.com.au. Fax: (08) 8724 2870 or Phone: (08) 8724 2876 or book on-line via the CDAA website to arrange permit. Divers must advise FSA of their online booking. Collect permits from the Forestry Office, RHS of driveway to Carter Holt, Jubilee Hwy, Mt G.

IMPORTANT:

- No diving on Total Fire Ban Days.
- Permit also required to run compressors during fire danger season.
- Keys for Hells Hole, Nettle Bed, Iddlebidy and Stinging Nettle Cave can be obtained from Lady Nelson Visitor Centre on presentation of Forestry SA permits.

Kilsby's	S	Landowner leased to CDAA	Access - We have access fortnightly. Minimum of 3 divers in the water at one time. Refer to CDAA website. Twin Tanks - Maximum depth of 40 metres on Air. Meet at gate of property at 8.55am or 12.55pm. Book on-line at www.cavedivers.com or contact Craig at kilsby@cavedivers.com.au No animals, visitors or mid-week diving allowed. No diving on Total Fire Ban Days.
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CDAA SITE ACCESS

SITE	LEVEL	OWNER	ACCESS DETAILS
MOUNT GAMBIER - SOUTH AUSTRALIA (continued)			
BARNOOLUT SITES			
Ten Eighty	S/C	Scotts Agencies P/L	Access: ALL BARNOOLUT SITES ARE CLOSED.
Blacks Hole	S/C	Scotts Agencies P/L	
Shaft	S/C	Generally open one weekend a month. Trevor Ashby	For access dates refer to Guidelines or the CDAA web page. Nitrox as a diving mix is not allowed in the Shaft unless a trimix endorsement is held but deco mixes attached to the shot line are permissible. Refer to Shaft access bulletin within CDAA Regulations. Divers applying to dive in the Shaft for the first time must document dive experience with twin tanks Download form off website. Email: shaft@cavedivers.com.au (Terri Allen, Mobile: 0419 176 633) Obtain key from Mt Gambier Tourist Information Centre. Access agreement must be signed prior to diving. 2 divers must sign out keys, all divers must sign in advising which groups they are diving with. Diving should be avoided after heavy rain due to possible water contamination. Diving hours are now restricted to 8am to 8pm CST.
Engelbrechts - East	C	Mt Gambier Council	be signed prior to diving. 2 divers must sign out keys, all divers must sign in advising which groups they are diving with. Diving should be avoided after heavy rain due to possible water contamination. Diving hours are now restricted to 8am to 8pm CST.
- West	P	Lessee	
Contact: Brenton & Kemelee		Ph: 08 8723 5552	
Three Sisters	P	Millicent Council	Download Indemnity from Web Page. Access available for experienced Penetration divers only. Low profile systems advised. Access agreement must be signed prior to diving. Please allow 4 weeks for indemnities to be processed.
McKay's Shaft	S		Contact Email: site@cavedivers.com.au .
Tank Cave	P	Mr. DYCER	Access Manager: Noel Dillon. Email: noel.dillon@macquarie.com
Baker's Cave	C	Manager: Brad Dibble E: site@cavedivers.com.au	Please write to the Site Access Director to dive in Baker's Cave. Include stamped self-addressed envelope. Climbing equipment required. Only open October to April.
NULLARBOR - WESTERN AUSTRALIA			
Cocklebidy	C/P		Apply in writing for permission to dive at least 4 weeks in advance of trip to: District Manager, Department of Environment and Conservation (DEC), PO Box 234, Esperance, W.A. 6450. Phone: (08) 9083 2100 Fax: (08) 9071 3657.
Murra El Elevyn	P/C		
Tommy Grahams	C		
Weebubbie	S/C	DPI	The Department for Planning and Infrastructure, Midland, State Land Services South East. PO Box 1575, Midland 6936. Contact Kim Allison, Email: kim.allison@dpi.wa.gov.au Phone (08) 9347 5047 Fax (08) 9347 5004
N.S.W. - WELLINGTON CAVES			
Limekiln (McCavity)	P/C		Both Penetration and Cave Level are being accepted for this cave depending on its water level at the time. The cave has a restriction at the entrance which is underwater making it a Penetration Dive. During drought, the water level drops to form a small lake below the restriction allowing experienced Cave Divers access to this delicate cave.
Water (Antidline)	C		Affected by high CO ₂ levels during Summer/Autumn. Access is co-ordinated with the Wellington Caves management by Greg Ryan - gregr@cs.usyd.edu.au . Phone (02)97434157
Rum Jungle Lake	S		Unrestricted access currently exists - Please refer advice Guidelines #68 or check CDAA website.
Burrinjuck	S/C/P		This is a tri-rated site. Please see details in issue No. 73. There are no specific access arrangements.

CDAА PRODUCTS CATALOGUE

DVD'S

DVD'S

DVD'S

POSTERS

ITEM	PRICE
A Cave Diver's Story - Steve Bogaerts Venture into the life of cave divers as they map the unknown underwater caves of Mexico. These underwater cave systems in Mexico are more extensive than anywhere else in the world. In fact, 11 three of the planets longest submerged cave systems are found on the Caribbean coastline. Follow Steve Bogaerts through some of the most amazing cave diving footage ever filmed.	\$35.00
Australian Cave Diving - A Contrast. By Tony Carlisle. Four short documentary-type videos on Warbla Cave, Three Sisters Cave, The Road to Toad Hall and Tank Cave.	\$25.00
Axsis Mundi. A unique expedition into the inner jungles of the Yucatan. For over a decade, explorer Curt Brown and his team of cave explorers have been pushing deeper into the inner jungles of the Yucatan in search of unexplored cenotes.	\$35.00
Cave Diving Beneath the Ozark Mountains - DVD - with footage of Ginnie Springs and the Gasconade River in the Ozark Mountains, Missouri. Over four days the team reach 2000 feet in, 200 feet deep, using scooters which they drag through restrictions using ropes. In this DVD they extend the survey of the cave.	\$30.00
Cave Diving Mount Gambier - DVD - from Novice cavern sites, to the much more intriguing penetration dives, 'Cave Diving Mt Gambier' will take you to places that are only accessible by trained cave divers and rarely seen by others. Featuring 15 of the most popular dive sites in Mt. Gambier.	\$40.00
China - Beneath the Wall - DVD - Sichuan Province in central China is home to some of the world's biggest cave systems. This film follows a team of British explorers as they attempt to link together two of the most spectacular caves and complete the tantalizing through trip. But as with so many expeditions into the unknown, things don't quite go as planned... A great film about dry caving exploration.	\$35.00
Down Deep Down Under. A spectacular film by Alex Wyszynja. Discover the hidden secrets of Mt Gambier's famous fresh water caves. Tucked away in S.A.'s Sth East are some of the country's best known freshwater caves. The physical challenge of cave diving makes Mount Gambier a diver's mecca.	\$25.00
Facing Darkness Following some of the greatest cave divers in north Florida, Facing Darkness invites you to discover the underwater caves and how divers safely explore them. About the geology, the danger and the passion.	\$35.00
Wokey Exposed. Filmed and produced by Gavin Newman, this award-winning film looks at the spectacular discoveries made by successive generations of explorers and joins the latest team to take up the challenge. Using specially designed camera systems we follow the divers to the very limits of the exploration as they attempt to push on into the darkness beyond the end of Wokey Hole.	\$35.00
WKPP Push for the Connection - DVD - Explorers from GUE's Woodville Karst Plain Project resolve to establish a link between two of the largest underwater cave systems in the world. Following a series of previously unimagiabe dives, exploration divers push nearly 7km into the extreme depths of the Wakulla & Leon Sinks cave system	\$35.00
THE SHAFT & TOMMY GRAHAM'S MAPS Both are 45cm x 30cm in size. To view either of these posters visit the online store.	\$12 ea incl. postage

CLOTHING, POSTERS, STICKERS

CLOTHING

MISC.

ITEM	PRICE
• Embroidered Crew Neck T-shirts. Black and Navy - S, M, L, XL, XXL Steel Grey - M and XL	\$25.00
• Embroidered Polo Shirts. Grey with black trim or black with red trim. Look very smart!	\$35.00
• Embroidered Hoodies. Black only - Available Sizes: S, L, XL	\$70.00
• Embroidered Hoodie with Front Zipper. Black Hoodie with Front Zipper. Embroidered with the CDAA Logo on the front and Cave Divers Association on the back. Available Sizes: M, L, XL & XXL	\$70.00
• Embroidered Trekka Jackets. Black only - Available Sizes: S, M, L, XL, XXL	\$135.00
• Polar Fleece Jumpers. Colours: Blue, Black. Original logo. Keeps you toasty warm & smart!	\$60.00
• Polar Fleece Vests. Blue, Black. Original logo. Great to wear as extra layer under the drysuit!	\$50.00
• Ladies Contrast Tee. Ladies stylish cut in Grey with Navy Blue sleeves. Available Sizes: 10, 12 and 14.	\$25.00
• Ladies White Stretch V Neck Tee. With embroidered logo. Available Sizes: 8, 10, 12 and 14.	\$25.00
• Caps and Beanies. Black only. \$20 each!	\$20.00
• CDAA Key Rings. Blue with gold motif. CDAA P.O. Box on back.	\$5.00
• Round Sticker. CDAA logo over line arrow.	\$1.00
• Bumper Sticker. Featuring photos by Dean Chamberlain.	\$1.00
• Log Book Folder. With embroidered CDAA logo on the front cover.	\$35.00
• Tank Cave Poster. Full Colour 14.5" x 25" poster of Tank Cave by Peter Rogers. Price includes p&h.	\$8.00
• Tank Cave Map. Premium matt or gloss 120g paper \$96.00 (laminated \$22.00 extra, silver back \$132.00)	
• CD of Guidelines 1-94 All Guidelines as searchable pdfs on CD.	\$10.00
• Stubby Holders - high quality 5mm neoprene with CDAA logo	\$8.00
• Travel Mugs - great for having a cuppa on the run	\$12.00
• Mask Slap Straps - fully embroidered with CDAA logo	\$16.00

**ALL ORDERS ARE NOW TO BE MADE ON-LINE
ON THE CDAA WEBSITE!**

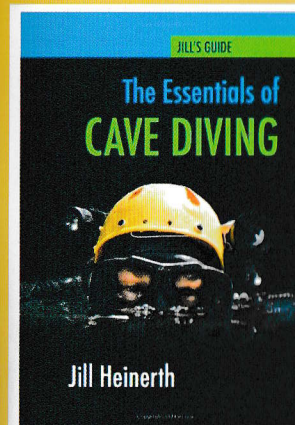
www.cavedivers.com.au

Thank You, Tara Toone

ITEM	PRICE
Abseiling Handbook. For those involved in basic recreational abseil instruction, this book details safe abseil practises for beginners. Contents include, risk management, equipment, anchor systems, abseil site set-up and instruction and emergency procedures.	\$20.00
Basic Underwater Cave Surveying. The standard publication for anyone remotely interested in research and survey techniques used in water filled caves.	\$30.00
Cave Diving Communications. A manual from NSS - CDS dealing exclusively with all underwater communications used in cave diving. Including touch, torch and line signals, and use of line arrows and jump reels.	\$25.00
Cave Diving - A Blueprint for Survival. A book by the world-renowned cave diver, the late Sheck Exley, this is a case study of a number of accidents that have occurred in the USA and how to avoid them.	\$20.00
Cave Diving - Articles & Opinions A comprehensive Guide to Cave Diving & Exploration. Edited by Jill Heinerth & Bill Oigarden. Written and edited by some of the top cave divers in the world, this book covers everything from basic equipment to advance cave exploration.	\$70.00
Cavern/Cave Diver Workbook. This workbook is the official training manual used by the NACD for the Cavern Diver and Cave Diver courses. It includes sections on accident analysis, cave types and their formation, equipment, communication and emergency procedures.	\$40.00
Caverns Measureless to Man. The story of the passion for cave diving of the late Sheck Exley who spent his life exploring underwater caves. Publications Directors pick. <i>Amazing book, a must read!</i>	\$50.00
CDAA Occasional Paper No. 2. From National Conference 1981. Includes topics such as Fossil Cave, Belay Techniques and Cocklebidy 1979.	\$2.00
Divers of the Dark - Exploring Budapest's Underground Caves A unique journey into an underground world that only a handful of people have visited. One of the most well-known springs is Malom Lake. It is a doorway to the cave system called Molnár János. Nobody knows how far or how deep below the city the tunnels reach. Magnificent photos!	\$75.00
Diving in Darkness By Martyn Farr. Personally signed by the author. Provides a clear, concise and modern overview of the essential equipment, skills and techniques required to dive in caves, mines, wrecks and beneath ice. Published in softback Diving in Darkness is packed with 170 photographs and diagrams throughout its 128 pages.	\$65.00
Hidden Splendours of the Yucatan. Hidden Splendours of the Yucatan is photographer/author Lalo Fiorelli's story of exploration, teaching, and photography in the caves of Mexico's Yucatan Peninsula. His stunning photography is complemented by the lively, down to earth writing style that brings the experience of exploration.	\$49.00
My Father, The Captain Is a unique, and unforgettable biography by Jean-Michel Cousteau on the career and life of Jacques Cousteau, the frontiers he opened and the legend he created.	\$39.00
NSS Cave Diving Manual. The standard reference manual in cave diving covering just about every conceivable topic. New Edition.	\$55.00
NSS Cavern Divers' Manual. The standard reference manual in cavern diving covering almost every conceivable topic. Also most principles behind safe sinkhole and cave diving.	\$30.00
Side Mount Profiles. The ultimate sidemount diving book by Brian Kakuk & Jill Heinerth Featuring: Wes Skiles, Lamar Hires, Jakub Rahacek, and Steve Bogaerts.	\$49.00
The Darkness Beckons. By Martyn Farr. The history and development of cave diving.	\$75.00
The Essentials of Cave Diving by Jill Heinerth. Woman Divers Hall of Fame member Jill Heinerth, has created this full color contemporary guidebook. Generously illustrated, containing practical 21st century underwater knowledge, including sidemount techniques and the latest rebreather technology.	\$49.00
The Taming of The Slough. This is Sheck Exley's exciting story of the discovery and mapping of the Peacock Springs Cave System - at the time the world's longest underwater cave.	\$45.00
Vertical. - A Technical Manual for Cavers by Alan Warild Vertical is a definitive guide to vertical cave exploration techniques. It describes deep cave exploration methods; emphasising the importance of safety, conservation and documentation. The fifth edition of Vertical is illustrated with photographs from expeditions on five continents.	\$45.00

CDAA PRODUCTS NEWS

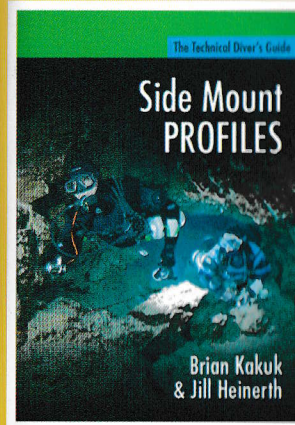
New books now available!



The Essentials of Cave Diving \$49

by Jill Heinerth.

Cave diving has been called the "most dangerous participatory sport" in the world. It doesn't have to be. With proper training, experience, and guidance, you can be a skilled cave diver, and enjoy this challenging and rewarding activity, for a lifetime. With decades of technical diving experience, including world record cave dives, and paradigm changing underwater exploration, Woman Divers Hall of Fame member Jill Heinerth, has created this full color contemporary guidebook. Generously illustrated, "The Essentials of Cave Diving" contains practical 21st century underwater knowledge, including sidemount techniques and the latest rebreather technology. Encompassing all levels of cave diving, from apprentice to expert, from sidemount to CCR, this guide is an essential manual; appropriate and relevant to all cave training disciplines.



Side Mount Profiles \$49

The ultimate sidemount diving book

by Brian Kakuk and Jill Heinerth.

With years of Side Mount diving experience, two of the sport's most acclaimed explorers, Brian Kakuk and Jill Heinerth, have teamed up to share their expertise with you in this generously illustrated and practical manual for open water, wreck, and cave diving enthusiasts. Featuring: Wes Skiles, Lamar Hires, Jakub Rahacek, and Steve Bogaerts.

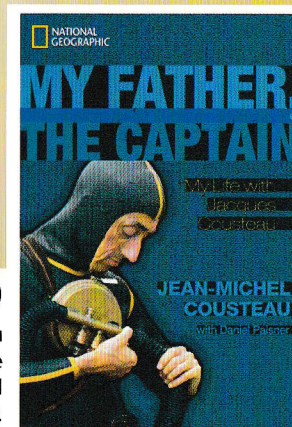
To view or order any of these new CDAA Products, please visit the Online Store.

Happy Diving!

Tara Toone,
CDAA Products Officer.

My Father, The Captain \$39

A unique and unforgettable biography by Jean-Michel Cousteau on the career and life of Jacques Cousteau, the frontiers he opened and the legend he created, and how Jean-Michel accepted to carry the flame of his father.

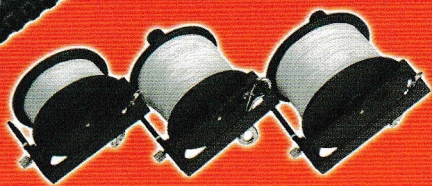


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