



C.D.A.A. Newsletter

No. 111 - MARCH 2010



SENTINEL

CAVE DIVERS ASSOCIATION OF AUSTRALIA

(Incorporated in South Australia)

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Front cover:

Photo title:
Dad and his buddy
in Tank Cave.

Photographed by
Liz Rodgers.

CAVE DIVERS ASSOCIATION OF AUSTRALIA

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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 Editor, David Bryant, PO Box 2198 Rosebud Vic. 3939.

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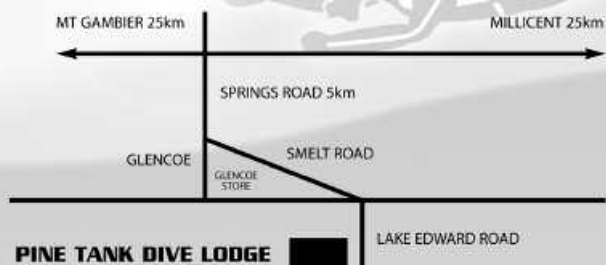
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CAVE DIVERS ASSOCIATION OF AUSTRALIA

Editorial

We have a packed issue with some great stories for readers to enjoy.

James Arundale and Agnes Milowka have been exploring in the Buchan Cave system in Victoria and this article will have you hooked from start to finish!

Stuart McGregor's interesting article on the Blue Holes exploration will run over three issues and will benefit considerably with full colour now on all pages.

Neville and Matt Skinner have been making some discoveries in Fossil Cave and have prepared a very detailed report that is well worth reading too.

Tom Smith has written a poem entitled 'At 39 Metres'. Liz Rodgers is credited with the picture to accompany Tom's poem and she also has the cover this quarter with her stunning picture of her Dad, Peter Rodgers and his dive buddy in Tank Cave.

Liz is using a 21 megapixel full frame Canon 5D MKII camera in an Aquatica housing with the Canon EF14mm f2.8L II USM lens. She has achieved great depth of field due to each of the divers wearing remote strobe flashes on their backs with the remotes sitting on their right shoulders. Thanks Liz, keep those great pictures coming.

Max Marriott is remembered in this issue with a touching story from Andrea Gordon.

All we can hope is that Max is in a better place now and finally at peace.

Published writer and cave diver Ian D Lewis has kindly offered to educate us all over the next few years with regular stories on how caves were formed and where the most likely future tunnels and passages will be found.

This edition is on Engelbrecht's Cave system and Ian has provided a map to support his science. Ian is currently completing his PhD thesis on Karst Geology.

Dive safe and enjoy,
Jason Caldwell
Records and Publications Director

Email: publications@cavedivers.com.au



'Dave's 2 Bar'

This issue features some fantastic new discoveries and adventures.... what can I say, cave divers sure are an adventurous bunch. I'm constantly amazed at the underwater images many of you shoot in what I believe are normally pitch black caves... an underwater photographer myself, I have created a new page (see p.37) so all you budding UW Photographers out there can show the readers a couple of your best images. If you are published, you'll receive a new Hollis Mask from Oceanic. And, if anyone would like to do an article on Cave Diving from a photographers point of view, now that would be a great article. Why not be the first!!... Dave Bryant.

Vale Max Marriot

I know there are a lot of others out there who have known Max a lot longer than Dave and I, but Max was the reason Dave and I got in to cave diving. This is probably true for many SA cave divers. He has had a huge impact on us and cave diving in SA. He was always so encouraging of SA and making sure SA was in the mix. "Make sure you vote for the SA Directors" was what he always used to say. He was also very encouraging of females when it came to cave diving and making sure they had every opportunity to match it with the boys. Everybody was capable of getting a skill wrong or equally, nailing it. And whether it be hard or good times there was always times to give yourself a pat on the back.

We had Max as an instructor all the way through to Pen. We had heard of this great mysterious and mythical like man Max Marriott well before we ever met him. His character was legendary and I was almost scared of meeting him. I remember the first time we met him, this huge intimidating bikie looking man, who turned out to be a gentle giant. I also remember the first discussion we had with him about doing the Cav/Sink course at his kitchen table when he grilled



us about why we wanted to start cave diving. Cave diving was serious. I was very excited but very nervous, and right from that point Max had started to drill in to us the need for respecting the cave diving environment. He was also exceptional when it came to communicating the need to respect land owners' wishes and that access was a privilege and not a right. To have Max all the way through to Pen level was an honour. Somebody recently said to me that he had enormous admiration for Max even though he had not been "guided through the system" by him, which is what he did for Dave and I. There was no rote learning or quick run-throughs, he guided you through the system. I believe the quality of both our Cav/Sink and

Cave courses that were solely with Max were outstanding. The time he would spend on land and in the pool with students to make sure they got skills right (and make them understand why they needed to get them right), was so generous. And why? Because he loved doing it. He loved teaching cave diving and the cave diving environment. I do not believe I would have the respect I do for cave diving in general if it were not for Max's teachings and guidance from the beginning. He loved his trips to Mount Gambier and thrived off showing new students around the place and answering questions. The trips we did with him post-courses

were hilarious. Max certainly was eccentric. His sense of humour and jokes could not be fully appreciated by somebody unless you had spent time with him. He was totally mischievous but when it came time to be serious, he was. He was also a true gentleman.

Finally, my heart goes out to Mary-Ann and her family. Max and Marry-Ann were one of the most beautiful couples I have ever met and I know she is going to miss him terribly. I know he would have been annoyed at leaving her. Max's nickname for Mary-Ann was Smiley

because she was so smiley. I think the reason she continued to smile was because of the relationship that she and Max had. There were no secrets between them, and Marry-Ann knew everything that was going on in the cave diving world! Max's family meant everything to him. He used to talk about how he loved working the hours he did with the time on and off in Adelaide as it meant that the time he had at home was nothing but quality time with his family. Then when his grandchildren came along there was an even greater outpouring of love.

Max will most certainly be missed by anybody who had the honour of knowing him.

Andrea Gordon CDAA #3822



MARCH 2009

It is with great sadness that Warrick McDonald and I attended CDAA member, Max Marriott's funeral in Adelaide in February. Max was a completely genuine person who championed cave diving in South Australia. I was very pleased to see many CDAA members including past and present Directors in attendance, several from interstate. A long standing Instructor and past Director, our thoughts are with Max's family during this difficult time.

Earlier this month Helen Higgins resigned as Business Director of the CDAA. Helen's passion and commitment will be missed within the organisation. The Directorate has installed Andrew Cronan as the Business Director for the Association and feel his business background will greatly benefit our members. He will remain in this position until the end of the year when both the Business Director and Standards Director positions will be up for vote. I would encourage those interested to contact the Directorate as it definitely helps to have some insight into the position prior to nominating.

I am very pleased to announce that the Directorate has negotiated additional insurance access for the CDAA. This includes dry-caving cover and also cover for non-divers on properties that we dive. There is no increase in insurance premiums. There will be a short delay in implementing these effectively. In a practical sense we hope to use this cover to incorporate rope access and dry-caving courses for our members. The end goal will be greater access to remote caves due to the increase in caving skills. Family members and friends will also be in a position to accompany members onto our dive sites. This will require a constitution change in order to incorporate an additional membership category. I hope this will enable a more family friendly club.

Recently all members had an opportunity to give input as to their thoughts on the financial direction of the Association. Subsequently a number of sub-committees were set up to deliver further suggestions to the National Committee.

The National Committee has a responsibility to handle the affairs of the Association and therefore will require the input and support of the membership prior to committing to any capital purchase. On behalf of the current Directors I am excited to finally announce that we are in the final stages of negotiating the purchase of Tank Cave.

Tank cave is the premier cave diving site in Mt Gambier. It is a world class dive site in the heart of Australia's primary cave training area. The purchase of Tank Cave could allow 24/7 access, this will have additional benefits to access arrangements. In particular visiting members with long distances to travel will benefit as the cave will be more readily available to them. Access could be achieved during the working week allowing more convenient access to visitors and holidaying divers. Although initially only benefiting Advanced Cave divers, any future structural development would potentially allow all levels to take advantage of the site. Cave conservation concerns would need to be considered.

A short online poll was instigated to include input from members. In total 25 people voted against the purchase, which represents 3% of the current membership. In line with this indication, the CDAA will continue with negotiations. I hope to bring you good news in this regard shortly.

Steve Trewavas.

LETTERS...

In regards to Life Membership.....

I write in response to the anonymous letter of "Member #4505" in the last issue of Guidelines. I am glad that you came to the conference and enjoyed the speakers and that as a new member of the CDAA you got the chance to dive in Kilsby's. The opportunity to dive that Sinkhole resulted from over 20 years of patience, research & negotiation so that members such as yourself can enjoy such a spectacular dive. It's breathtaking!

However, you then go on to state that you were "horrified" when Warrick McDonald's Life Membership nomination was refused. One of the reasons was that Life Membership in the CDAA is not conferred for length of service in office. If it was, there are plenty of former CDAA committee members and Instructors who would also have been nominated over the years. Before the Instructors, there were long-serving Examiners too, and Regional Representatives who performed their duties for many years. I will also declare at this point that I am a Life Member and although I also had to leave the room for the vote, I know I wasn't awarded this honour for committee service. When someone successfully stands for election in the CDAA, the aim is not to collect Life Membership for it - the voting membership expects them to perform their tasks. This is the same in any organisation.

Life membership is rare because it is awarded for extensive contributions to the CDAA and the sport of Cave Diving way beyond that of the obligations of elected office. Brownie's Life membership is an excellent example - the expeditions and technological innovations he

organised over about 30 years have made a lasting impact on the sport in Australia. The few of us who have been awarded Life Membership have received it 10 or 20 years or more since we began doing those things for which we have been recognised - in diving terms that's half a lifetime of work. It's no secret that Brownie & I banged heads at committee meetings for years! But I and everyone else fully supported his Life Membership nomination and those of the others in earlier years because of the fantastic things they have achieved. Life membership in any organisation is an award "By Acclamation", meaning the full support of members, not a voting contest seeking only a 51% majority. Unless a good 95% of members support a Life Membership nomination, it's not a respected award that an organisation wishes to give. Warrick has achieved some important things in office and I would certainly be prepared to consider nominating him in 10 year's time, now that he has the opportunity and time to undertake and fulfil his own particular cave diving achievements.

Perhaps your letter is a good reminder though - if the current and newer membership is not aware of Life Member contributions, we do have an obligation to provide that information for you all, as it's your entitlement to know and part of your heritage as CDAA Members. I'll volunteer to do it. But please put your name on your next article.

Ian D Lewis
CDAA #258 and Life Member.



Since the start of 2010, there has been what seems, a significant number of divers from overseas requesting Special Visitors Permits. So, is Australia now recognised as a premier cave diving location? If the last question is the case, it's about time! One diver was so impressed with our system of SVP's, safety aspects, booking procedures and what he read in the recent Dive Log article, he emailed his training agency in Europe and expounded the virtues of the CDAA. They then responded with an open invitation to any of our members with help in organising dives in their location.

Many Instructors have renewed their teaching status for the year, so welcome back, and I look forward to working with you. We are now moving toward having more training materials readily available online, starting with Deep Cavern exams and answer sheets. Some of the Advanced Cave candidate material will also soon be available which will hopefully allow us to spend less time doing theory during the program, and more time in the water.

I'd like to take this opportunity to thank Andy Higgins who stood down from his role of Instructor Advocate and Instructor Records. Andy is well known to many members and still remains an active Instructor within the CDAA. Taking on both roles is Paul Leslie who is also an active Instructor & member of the Training Committee.

It was great to see those who attended the recent 'Climbing Course' workshop in Melbourne, and thanks need to go to Mischa Temple and Steve Trewavas for putting it together. It may take a little time to get a course finalised, and it will be a terrific addition to programs that the CDAA will offer.

A suggestion has been made to have a 'Stage Cylinder Handling Workshop' to assist those who have not had the opportunity of using stages, or even for those who have perhaps used one stage only. Information will include correct rigging and marking of cylinders, in-water handling, the use of leashes and so on.

And finally - vale Max Marriott, a long standing and well respected member, Instructor and past Director of the Association. He is already sadly missed by many.

Jane Bowman.

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John, Sharon and Erica.

Cave diving in Victoria:

Jim Arundale (CDG) and Agnes Milowka (NSS-CDS)

Exploration of the Elk River streamway

The Buchan area is one of the largest karst features in Victoria.

It is a farming area like Mt Gambier but the landscape is very different. Here there are rolling hills and some reasonably sized rivers, although the flies remain the same.

Underneath this landscape is a honeycomb of caves. The Pot Holes Reserve in particular is absolutely littered with them with more than 90 caves known. Until recently all these caves were dry and there was no opportunity for diving.

In early 2006 a group of local cavers, the Victorian Limestone Caving Team (VLCT) dug open an entrance to a cave that led down to a streamway, admittedly, not a large streamway, but flowing water none the less. At the time, on the Potholes Reserve in Buchan all the known caves dropped quite steeply to a level of impermeable chert resulting in the caves petering out. People had talked for years about the "Master Cave" that must exist in the next level of limestone beneath the chert, but nothing had gone through, until Elk River. The initial streamway that had been found ran for about 100m before terminating at both ends in sumps.

Peter Freeman from the Victorian Speological Society (VSA) recounted the stories of the discovery to Jim Arundale and Agnes Milowka one evening after a day of caving in Buchan. As soon as Peter mentioned the word 'sump', their ears prickled up. A few weeks later they got to see the streamway and the sump for themselves and got rather excited. It looked like the sump would continue for at least a couple of meters. Excitement was heightened when it was discovered that the only dive had been done by a diver wearing back mounted tanks who reported the sump pinched out – the

scene was set and a return planned.

At this time Ag was lured away by Florida caves and the initial trips were just by Jim. On the first trip Jim dropped into the downstream sump with a wet-suit and a single side mounted 40cuff and floated in quickly to try and stay ahead of the silt. Initially the visibility was excellent and the dive progressed in a low bedding plane that slowly dropped to about 30cm after around 3m. At this point, the glimmering of an air surface could be seen about several metres ahead, unfortunately this coincided with the floor rising. Over the course of several short dives, the end was pushed by digging. At this point with head on one side, the gravel floor slumping in behind and the single regulator complaining about the quantity of stones in the water, it was decided that slightly more equipment was going to be needed to get a reasonable safety margin, so a retreat was made.

The fun was not over for the day though and attention was turned to the upstream sump. This was passed after 4m and 10m of airspace was reached before the passage sumped again. This was investi-

gated for about 12m to a point where lack of line, air and testosterone indicated a return, which was made in zero visibility.

A few months later a return was made with two small cylinders and work began in earnest on the downstream sump. Inspired by another brief glimpse of the surface, the floor was scooped out by hand and pushed off to one side. Despite the disconcerting feeling that everything was slumping in behind him, progress was being made. After several minutes, an outstretched hand could just feel a vertical rise in the roof. Digging continued until finally one eye could just glimpse a large airspace continuing out of sight. After some more frantic digging, the rest of the head emerged, followed shortly afterwards by the rest of the body.

The dive gear was quickly dropped and Jim skipped off down what was noticeably a much larger streamway. After several large chambers and a couple of very nice calcite waterfalls a large round chamber with a big pool was reached - yet another sump. Conscious of the time away and the prospect of a rather nasty dive back, exploration halted and Jim retraced his steps. The dive out was not one of the nicest, it took a couple of attempts, some serious digging and squeezing to get back out.

One more solo trip was made in order to survey, but as the survey gear had flooded, the time was spent taking photographs and modifying the exit of the sump to try and make it self clearing, a little larger and hence a bit safer.

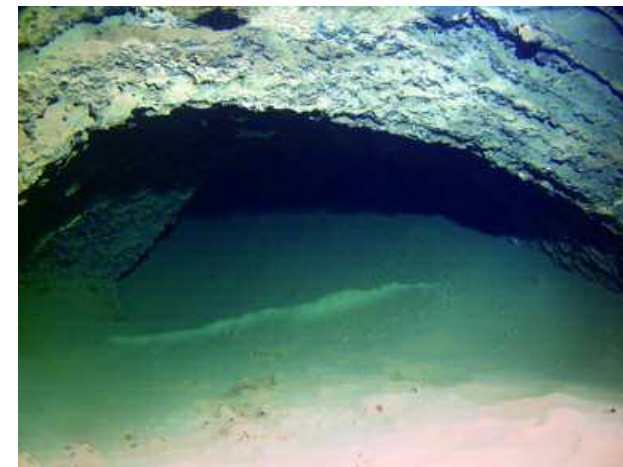
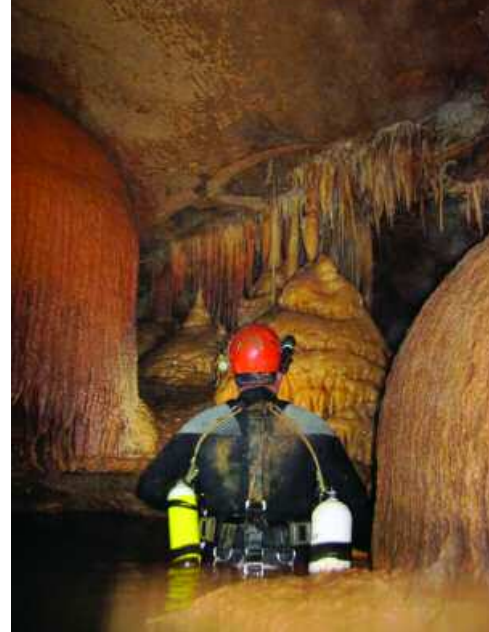
The descent down to the actual water level is not all beer and skittles and getting to the sump is a trip in itself. It is not like diving in Mt Gambier where you drive up to a dive site, chuck on the tanks and take a leisurely stroll down stairs to the water. In Buchan, sherpas are needed as they help drag the

numerous bags filled with heavy diving equipment through the dry passage. The entrance to the Elk streamway is via Baby Berger cave and involves an abseil, a bit of laddering and plenty of crawling before you hit the water. One crawl in particular is, what can most politely be described as an absolute nuisance.

Finally there are a couple of 'roof sniffs' in order to reach the sump itself. Roof sniffs are passages almost filled to the brim but not quite. The little bit of space in between the water and

the ceiling means that you can negotiate it by floating on your back, nose to the ceiling, 'sniffing' the ceiling. Then, finally, you reach the first of the sumps to begin the diving.

In August 2009 Ag was back and the exploration continued. The second downstream sump was dived and proved to be short and led to an incredible perched sump pool with more larger passage continuing... to another sump. Again this was short and easy leading to over 300m of large streamway. The last sump of the day continued in the same style and Elk 5 proved to be nearly half a kilometre long ending in a rift pitch.





cave in order to make continued progress through the 6m deep and 60m long sump 6. The second upstream sump was likewise pushed out to 60m, which led Ag to explore a much smaller and lower passage that after 50m, unsurprisingly, sumped yet again. Currently the streamway is over 1400m in length but a fair bit more caving and diving remains to be done in Elk in order to discover all its secrets.

Elk River it seems is the main drain for the area, the long lost and much theorised about 'master cave system'. The cave is of outstanding importance in Victoria and is the most important since the early 1900s, when Frank Moon discovered Fairy and Royal Caves (the Buchan Show Cave system). The discovery totally re-writes the books about hydrology and geological structure in the area. Further, it is easily the deepest cave in Victoria, now 105m deep, and it has the potential to drop further still, which is incredible given that none of the caves in the Buchan area go deeper than 60m. On top of that, it has the potential to become the longest continuous stream passage in Victoria. These accolades have meant the cave system is now referred to as the 'Murrindal Potholes Eastern Master Cave' (MPEMC). The official name doesn't quite roll off the tongue, so the team continues to affectionately refer to it as 'Elk'.

While it is unlikely the cave diving in Victoria is ever going to take over from Tank Cave and the easy stairs of Mt Gambier, there is water and diveable passage in Buchan and it is incredible stuff.

Over the course of the exploration Jim and Ag had fabulous support. Without these folks, the exploration would have been virtually impossible. So a big thank you goes to Peter Freeman, Neil Wilson, Ian 'Chalky' Thomas, Miles and Daryl Pierce and Ted Matthews.

The trip ended up being a hard 12 hour slog, yet was thoroughly enjoyed and treasured by the duo. The divers negotiated serious cave, low bedding planes, high rift passages, large chambers, rock falls & narrow rifts and some more tricky obstacles such as waterfalls and climbs. A couple of these climbs required some optimism and interesting acrobatics to free climb. Then there was the mud, deep and slippery and overlain with water, which made walking painful and strenuous when carrying dive gear. On the upside the cave was highly decorated with incredible formations such as flowstone, stalactites, stalagmites, rimstone pools and helictites and these distracted from the arduous conditions, albeit temporarily. On the way out the beautiful cobalt blue sumps resembled a mud bath and the divers were compelled to feel and grope their way out, as even their hands couldn't be seen on the line. All this certainly made for a very sporty and memorable trip.

Jim and Ag returned four more times, lastly accompanied by Ken Smith and Mike Collins on a marathon 18 hour trip that combined surveying, photography and exploration at the far end of the cave. The end rift pitch was climbed only to discover two more sumps beyond. These sumps are deeper and longer, thus the team is faced with hauling ever-larger cylinders to the very back end of the

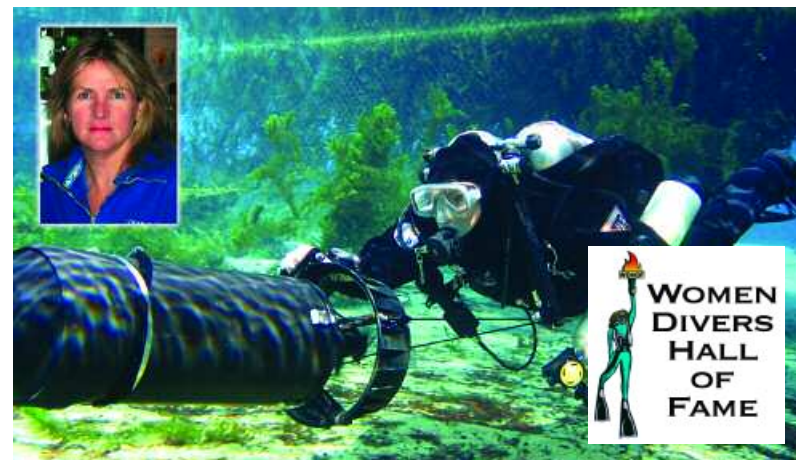


Special Announcement...

Congratulations Jane Bowman *Inductee into the Women Divers Hall of Fame*

We are very pleased and proud to announce that our very own Jane Bowman is one of the latest members to join the WDHOFF. The Women Divers Hall of Fame (WDHOFF) is an international, not-for-profit organisation that seeks to recognise and honour the many women whose achievements have enriched the world-wide diving community.

This is a highly prestigious award and Jane is only the second Australian woman after Valerie Taylor to receive this honour.



WOMEN DIVERS HALL OF FAME 2010 MEMBERSHIP ROSTER

The Women Divers Hall of Fame welcomes 10 New Members in 2010.

The following summary provides a glimpse into the exciting and diverse backgrounds of the newest class of WDHOFF members:

Jane Bowman

Of the 8000 dives Jane has made, 2000 have been in caves. One of Australia's leading female cave divers and instructors, Jane's diving highlights include diving in Mexico, Florida, the Nullarbor Cave systems (in central Australian desert), Palau, Vanuatu and too many other exotic dive destinations to list. Jane has issued 4000 diving certifications through PADI and the

Cave Divers Association of Australia (CDAA), many at the upper limit of Australian cave diver training. Jane is the current Standards Director for the CDAA, the first woman to hold this challenging position since the association officially formed in 1973.

Please see here for more details:

<http://www.wdhof.org/index2.shtml>

Jane is one of the few female PADI course directors in Australia and co-owner of Ocean Divers in Melbourne. Thanks to the CDAA members and other members of the dive community involved in this nomination.

Terri Allen, CDAA Cave Instructor.

KARST GEOLOGY

WITH IAN D. LEWIS



Stories of Englebrecht's Cave

I've been cave diving for 40 years now, not quite as long as Phil Prust and Dave Warnes, but that's because they taught me - probably to their eternal regret! Before that, I grew up in Mt Gambier as a kid and went caving all over the district from the age of 12, in 1966, I got extremely interested in mapping caves and learning their history. And that's what I've been doing ever since, gathering stories and history about the caves and understanding their geology. I'm currently finishing a PhD thesis on the geology of the caves at Naracoorte and their relationship to the Kanawinka Fault, so it's a lifelong interest. Plenty of divers and cavers have been involved over those decades in research projects contributing to our knowledge of caves and sinkholes across the region. But not many divers know the stories behind each of the caves

So over the next few years I'm writing a series of stories and explanations of various sites for *Guidelines*. Part of this is to make sure the background of these caves continues to be told, and also to ensure that newer generations of cave divers who have never heard of half of us from earlier years can share in the enjoyment of that research. I'll write about one cave at a time as each has its story, but first you need to know a bit about the region's history to put these cave stories in perspective.

Settlement around Sinkholes

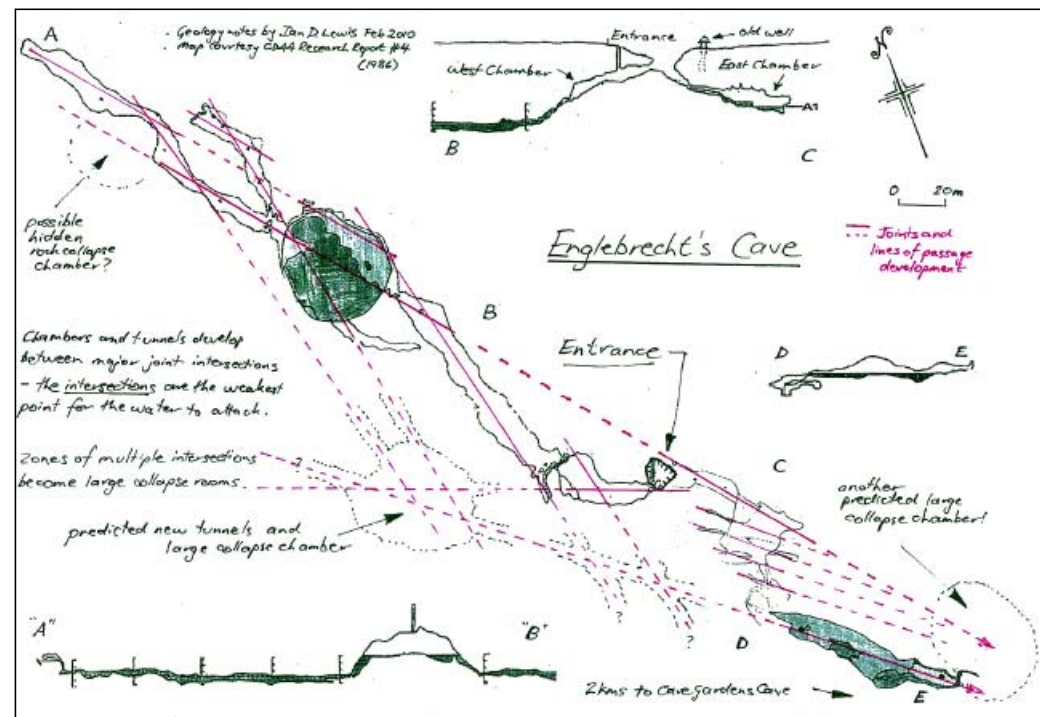
The Mt Gambier and Mt Schank volcanoes were sighted from offshore by Lieutenant James Grant in 1800 as he sailed past mapping this coast in the ship *Lady Nelson*. A full-scale replica of this is at the Mt Gambier Tourist Information Centre, which you can walk through. This is the same man who on the same expedition discovered Portland Bay and Cape Otway was the first ever to enter Port Phillip Bay. His Bosun was William Pope, the man who discovered Pope's Eye Sandbank by leaning over the bow with a sounding line and yelling a warning as the *Lady Nelson*

approached the steeply rising sandbank. The ship was saved by Pope's sharp eyesight - hence its name "Pope's Eye" - the name given to it 60 years before a rock wall was built around it.

The *Lady Nelson* did not land after sighting Mt Gambier. It was another 36 years before the Henty brothers sighted the mountain from the Kanawinka Fault ridgeline just east of Dartmoor while looking for pasture land to the west. It is thought they had knowledge of or a copy of Grant's coastline map with the two named Mountains. Their first visit in 1836 discovered the amazing Blue Lake and they built a stockyard in the Browne's Lake basin (which interestingly was dry at the time) next to the Valley Lake. They explored around the mountain and discovered the Cave Gardens, quite probably Umpherston's Sinkhole and maybe Englebrecht's Cave. Within a couple of years, Evelyn Sturt, the brother of Charles Sturt the explorer and a rich landholder in Adelaide, had the Hentys booted out when he worked out where the Victorian border was and took over a pastoral lease for the whole Mt Gambier area including all these caves and their water. Later he got even richer when the town was surveyed and subdivided. His mansion is near Tension College on the western slopes of the Mountain.

Mt Gambier is known as the "City around a Cave". There are a couple of early sketches showing steps down into the Cave Gardens for people to get water, as there was a clear lake there at one stage (though I think they are actually sketches of Englebrecht's entrance). Later, alongside the entrances of all three caves, locals dug 1-metre diameter well shafts directly over the then-existing lakes to draw water directly by windlass. You can see the wells alongside the entrances at Umpherston's Sinkhole and Englebrecht's Cave and under perspex on the north-west edge of the Cave Gardens - in each cave you can also see the well shafts from underneath. Why is this significant? Because there are no signs of lakes anywhere directly beneath these shafts today and they have not been above water in the time since scuba diving has been invented. They were dug at a time of exceedingly high water level, risen some decades after the Henty brothers arrived.

The story of fluctuating water levels in the region is far more than just the recent decline and will have to wait for another *Guidelines* article - but it's fascinating.



Stories that Englebrecht's Cave can tell

This article is about Englebrecht's Cave, which has a chequered history since settlement and has gone through various stages of diving discoveries. It has a geological significance that divers are unaware about; nor indeed are the general public. I'll talk about the history first as the background sets the scene for much of what has happened.

There are a number of sources for historical information about Englebrecht's Cave. Peter Horne authored the "Englebrecht's Cave Mapping Project 1986" for CDAA's Research Report Number 4, one of dozens of quite outstanding detailed cave & sinkhole reports he has contributed to the sport & science of cave diving over several decades. Peter Stace and I featured a two-page spread on Englebrecht's Cave history in our book "Cave Diving in Australia" which only showed a map of the Eastern Side as the western underwater tunnel was not even known then! Another excellent source is the information available in the beaut display at the Englebrecht's Kiosk run by Rhiannon and her team - we wish them all the very best of success with taking on the Concession.

I'll quote a bit from our *Cave Diving in Australia* book (p142) which is in part taken from an old newspaper article "In 1864 a group of 4 men and one ten-year-old boy named Charles Grosser, led by Dr Wehl of Mt Gambier [whom Wehl St is named after] entered a cave entrance on

North Terrace [the old name for Jubilee Highway West]. With them into the cave they carried a canoe built of hardwood and sealed with pitch to undertake a hazardous exploration of the subterranean waterways. In an article written in 1933, the 10-year-old boy, now Mr C. Grosser aged 79 recounted...

"I can clearly remember how the current caught the canoe and carried us along as soon as we got into the stream. We must have gone 200 yards [metres], travelling directly towards the Blue Lake. The stream took several turns, and the current was so strong we had great difficulty in getting back."

This is particularly interesting. As all divers know, there is no flowing water in Mt Gambier caves and hasn't been since diving started in the 1960's. Is it possible however that 100 years before, when the water table was the highest it has ever been since European settlement had begun with the Hentys, that water flowed in some caves? For the last 40 years those of us researching caves and groundwater have dismissed this account, wondering if a 10-year-old in the dark with candles in a canoe had imagined much of it, particularly in later years. But consider - if anyone had said to cave divers in 1970 that the water table would drop nearly 5 metres in only 40 years, we would have laughed at them. This suggests that water variability across the Mt Gambier region may be considerably greater than we think we know, and nowadays many historians on all manner of subjects are acknowledging the relevance of oral histories (people's descriptions of the Titanic sinking, the Stolen Generations

etc). So did the young Charles Grosser see something in the earlier cave hydrology that we can't imagine nowadays? Quite possibly. The scalloping and solution features all over the walls and roof of the eastern chamber are far more ancient than a century ago but do indicate phases of pre-historic water flow. And old Charles is right - the Eastern Chamber heads directly towards the Cave Gardens (about 2 kms away) which has a (grotty) pool heading back directly towards Englebrecht's Cave.

Pollution and Discoveries

I first visited Englebrecht's Cave as a teenager in 1967. The entrance was full of wire and rusting rubbish - we had to clamber through all the wire and crawl down the eastern passage through broken glass squeezing against the roof all the way to the lake. There were no lights, paths or platforms in existence. The western side chamber was so buried in wire rolls etc that no-one even knew it was there at that time! No-one remembers now, but at that time straight over the road on the north side of the highway was the Scott's Transport truck yard where there is now a supermarket, petrol station and about 3 workshops. That meant that when the stock trucks were hosed out all the crap went straight across the road and down the slope into Englebrecht's entrance along with oil, diesel and other runoff. There is a stormwater pipe still sticking out of the northern entrance wall. There's no blame here - no-one in the community was aware of the interconnectedness of the groundwater system then and it wasn't until the early 70's that pollution detection programmes began to connect the dots. Everyone knows it now, but nobody knew it then! Cave diver research programmes have contributed solidly to this understanding. Scotty eventually moved west of the city for more yard space and to help eliminate the pollution problem. After the Lions Club cleaned out the cave, CDAA divers got into the water and began finding things. To quote Peter Horne's report (p3) "Around the same time that this cleanup was commencing, cave divers Peter Stace, Phil Prust and Ron and Robyn Allum decided to assess the site again - the first visit by divers in 15 years - whereupon they promptly discovered the Eastern Side's large air chamber. Later in May 1979, Ron squeezed through what was a very tight, silty and unstable tunnel in the small pool on the Western Side, where he discovered that the passage opened up ... through a restriction and explored the 100-metre long submerged passage which headed off to the north-west." For some time after that, everyone thought that the passage simply came to an end in a rock blockoff.

A serious side to exploration dives

Then in 1979 I did a dive with Terry Reardon (now chief Bat Man for the South Australian Museum). Because I'd been a dry caver as a teenager mapping every last little passageway, I went right to the rockface at the end of the tunnel, because

YOU NEVER KNOW! Imagine my amazement when my air bubbles disappeared straight up into that new lake! Terry and I explored the inner chamber and a short way into the other underwater extensions there but while walking back to the exit lake to dive out, I trod on one of those thin flat rock slabs that are pretty crumbly in there. It broke under my weight and I smashed my head on a boulder, cut my head and nearly passed out. Terry came over to help me but I was really groggy so we sat there for a while. Then we both realised that nobody on the entire planet knew where we were ... there was no-one up top, and no cave diver knew that the end of the first tunnel went straight up into a large unknown chamber. We considered leaving me there while Terry went out but my head cleared a bit so we both dived out very slowly - I was not too flash. But we got out OK because of our good buddy training. These were the days of single tank diving too - think of that when you go through to the inner chamber next time! This incident got the CDAA thinking seriously about surface notification and backup divers etc which became common practice. Bloody serious when I think back on it now.

What you are actually diving through - some special Geology

When you walk down to the Eastern Chamber platform, look up at the walls and roof. They are actually far more interesting than the mud and the water! You see a rift going upwards, then scalloping and curved solution blades and rippling on the walls plus a number of horizontal "notch levels" or wall channels extending right along the southern wall. Then of course there is the low flat tunnel that you dive through to the next chamber. Standing on the platform, you are seeing at least 3 separate geological phases that have occurred in that room.

The first one is the rift. Geologists and Geomorphologists call it a "Joint" - a line of weakness in the limestone where it's been split and later opened up by water. There are thousands of these splits all over the South East, many with caves in them like Morgan's Cave and Vine's Fissure over towards Tantanoola. In Englebrecht's East, you come across more of them where you turn right at the tie-off rock as you dive through to the inner East chamber. When water seeps down from above it widens these joints and they bell out a bit like the Englebrecht's East platform chamber does. The second geological phase occurred over long time periods when lake levels rose and fell in the rift. When I saw it in 1967, the lake was about 6 metres higher than now, and would have completely drowned the ramp and most of the lower steps. But this has also occurred many times before over thousands of years and has left a geo-history of the scallops and wall notches showing where water stayed at one level for some time. Water attacks the limestone most strongly at lake level where it is most acidic due to air contact, so it

dissolves the scallops and grooves in the side-walls. This process also accounts for the third geological phase when at some time the water dropped to the level of the low flat connector passage that you dive through. That is there because water stayed at that particular level for a far longer time than any other depth, long enough for it to dissolve away the entire flat passage. This then naturally intersected the next lot of vertical joints which are the inner chamber system.

To see these three phases by standing on the platform is wonderful geological science and a picture of at least 20,000 years of geo-history - possibly far older even than that. Why can't you see these features in the western Chamber? Because all of its walls have been collapsing rock-by-rock over that time, burying the wall-scalloping evidence. The only thing that still remains there is phase three - the long flat western tunnel. But it has no flat side extensions leading to parallel joint passages on either side...yet!

It may only take one diver to move the right rock and off we go. Remember how easy it was to find the Western Chamber, by just poking my nose an extra metre?

People also ask the guides if Englebrecht's Cave is volcanic. That's because most people don't really know the difference between various types of rocks - in this case limestone and

basalt. It's not volcanic, but I have to say it is possible that the joints in the Englebrecht system may have been multiplied or widened by the huge forces on the whole limestone area where the city is now. These forces occurred when the lava and steam forced its way through the limestone close by and the volcano blew up multiple times, forming the four big craters and the incredible Blue Lake when the ground-water flooded the giant hole left in the limestone. A reasonable scientific estimate for this event was around 23,000 years ago. From my geological work in other caves around the district, I expect that Englebrecht's Cave is more probably 100-200,000 years old and these phases within it have occurred throughout that time.

So Englebrecht's has plenty of stories to tell. I could fill this whole *Guidelines* with more on just this cave and the issues it raises, but Jason won't let me so it might have to wait for a few years while I tell some of the stories of other sites you all dive in. I reckon Englebrecht's is a fantastically interesting place to be in and it's one of my favourite caves, despite all those bloody steps!

Ian D Lewis, CDAA #258



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An aerial photograph of a large, circular blue hole in a green, hilly landscape. A small boat is visible on the water's surface, and a diver is seen underwater. The text 'Sydney Projects: Australian Blue Holes Exploration 2009' is overlaid on the image, with 'PART 1 - 17th to 25th October Diaries' at the bottom.

Sydney Projects:

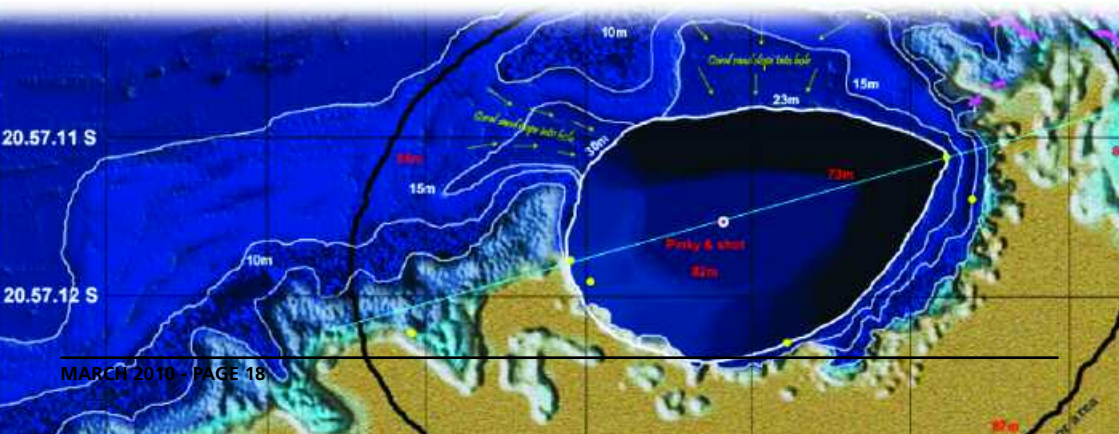
Australian Blue Holes Exploration 2009

PART 1 - 17th to 25th October Diaries

PART 1 - 17th to 25th October Diaries

Technically speaking there was months of preparation for this first trip, we had a stack of known sites without any real detailed information, no GPS locations with any accuracy. Our information was obtained from a lot of stories and speculations. Even so we planned a trip based on 30 plausible sites in the Great Barrier Reef, Pompey Hardline Complex centred on Barrier Star Blue hole, a hole with more fact than fiction behind it. We knew Barrier Star to be around 90m deep due to first hand accounts, but late in the planning it jumped to 130m as a result of a more recent diving story which can be as inaccurate as fishing stories, you just don't know. Was there more to the hole? 130m is more of a big deal for our rebreather tri-mix divers...

Story by Stu McGregor, pictures from video.



It was not until late in the preparation further research uncovered an old 1966 map of the reef with some holes marked on it, armed with this “new” information Barrier Star moved to a new location 100km further south. This called upon a new plan to be developed which would all come unstuck on the trip anyway. You could say diving anywhere in the Great Barrier reef is all good and is, but this trip had a focus on diving blue holes and caves exploration.

Added to the possibility of an increased depth is strong surface currents. Currents are a deep divers pet hate. Not so thrilled with current above one knot they whinge a bit, 3 knots they are somewhat more stubborn and you are lucky to get them in the water. (The whole swept away thing plays on their minds).

Our reef diving trip coincided with a spring tide which does have a few plus and minus factors. One is jet steaming 15 knot currents in the channels, it could be fun but the tri-mix divers failed really to see this. In the unlikely event of being swept off a dive site into a channel it becomes more more like riding rapids down a river than diving; keep your knees up, feet facing forward, as you move at up to 100m per second and enjoy the ride, go with the flow as there nothing you can do about it. Yes avoiding being pinned on reef walls is also healthy.

Fact on paper, currents on this trip will be between 1 and 15 knots. The plus, spring tides is higher water over the reef hardline. Re-breather divers are bulky creatures, meaning; they will be less likely to perform a modern version of keel hauling. Being swept over the reef not ending up as little bits of fish food on the outer reef side is a positive.

Normal tourist reef diving does not expose divers to anything like these conditions and plays it quite safe, some of our intended dives sites were so extreme and difficult to plan, border on a suicide missions if a slightest hiccup in the planning. Being realistic Barrier Star was expected zero current below the hardline; The “Hardline” is the very top of a reef outcrop, can be exposed, normally depending on tides has 200 mil-
limetres, up 3 metres of water flowing over it, 1 to 5 knots current is common. The nearby “main channels”; are hundreds of metres

wide, sheer walls, gorged out by current down to 70 to 90 metres deep, 5 to 8 knot currents are common, 15 knot is the "jet stream" effect which occurs at the peak period during "spring tides". All other sites had potential for 3 to 5 knots of current on the "flood" as it is referred to for the tidal movement of the water. In large open areas tidal currents are 1 to 3 knots.

What it means: We take the issue of current very seriously. A Tri-mix divers with long decompression in the current zone = plausible drifts for kilometres before surfacing, a significant problem.

...Just after 2pm was the first attempt to cross into the channel, we went from 30 metres deep into 12 metre shallow reef area that caused massive Eddie whirl pools, Scott our skipper knows full well that they can have a 100 ton boat doing 360s to the thrill of the customers...

So to ensure basic safety I took an idea of a survival pack in the lead up to this trip and developed it into a practical working unit for deep divers, actually any offshore diver really. The idea being for it to act as a gap filler between the “in water” visual boat to diver spotting distance (600m+) to before the deployment of a personal location beacon (PLB)

In our case being 300km offshore means a 20 to 24 hour plus wait for shore rescue and in all likelihood being swept away in an adventure highly likely to occur.

Our survival pack had two key things: a UHF radio and GPS in a waterproof container with an unofficial (U) depth rating of 150 metres. The principle is simple, once on the surface a diver would open the pack, turn on the units and radio their location to a dory or the mother-ship, who should respond by sending a dory to pick them up. This gave us a diver surface recovery range of around 10km (U) well tested to 6kms in practical testing



and recovery, and it was effective.

Saturday 17th 8am. What a long time coming to first step on the boat. The usual meet and greet followed by the bad news: winds predicted to be 20 to 30 knots, swell 3 to 4 metres for the next few days, coupled with 1 to 15 knot currents when we got there. On paper this was not good. The options were;

1: sit in Gladstone for few days and hope the weather improves, however given the distance we have to travel stuffs our chances of reaching Barrier Star or

2: deal with it and go, meaning an overnight crossing of the void between the coast and the reef - some 240km - in rough seas is really going to hurt.... Every day is an adventure.

The boat **MV Norval** a fishing charter vessel, we modified to a dive boat by building tank and equipment racks to hold:

- 7G size tanks,
- 4 went in the hold
- 30 standard size dive tanks, a stack of little tanks,
- 4 DPVs and
- 8 rebreathers



• plus bags and tubs of assorted dive gear, pinkies and shot lines. The gear list was endless, all secure for the night crossing, "hells waters"

Dave apperley, Kevin Okeby, frit Breuseker, Samir Alhafith and Andrew Del Riccio who had driven up from Sydney, had arrived the afternoon before. Tim Cashman flown in from Wales, Craig Challen from Perth and Anges Milowka from Melbourne arrived on the day. They are all rebreather tri-mix divers on the trip, little old me the standard air sucker... After shopping for drinks



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and snacks, left the dock at 5pm...

Sunday 9am. The boat is tucked in behind the main reefs and we gain shelter from the swell. The night crossing wasn't so bad, being throw vertical in the bunk is a lot better than been thrown out of it and only a few were a little worse for wear and tear.

After the ordeal, breakfast stayed down with those up for it...

The boat travels at around 8 knots with active sonar running all the time. Very little is known about the reef and it has not been completely surveyed, so the known tracks in the reef are important to the skipper. Now that we are in unfamiliar territory

night movement on the reef is impossible. I had a large cloth map made of the reef and I plotted our location and depths onto the map.

Accurately predicting tide times and heights in the reef is incredibly complex not unlike rocket science. However and ironically, simple is best. The technical method of calculating ball park figures and implementing fudge factors based on tide gauges hundred kilometres apart happens to equal the same result; A good guess...

The issue at hand - Barrier Star - is on the outer reef's ocean side with a channel 500m wide by 7km long in which the current may be ripping at around 15 knots. Going against the tide in our 8 knot speeding vessel can't take on the "flood" in the wrong direction and additionally we have the potential "wall" the difference between channel heights and water on either side. Tidal wise this doesn't amount to much 200 to 300mm however any swell 1 to 4 metres held up maybe a bit more sporty...

Given no idea what the outer reef winds - still blowing 20 to 30 knots - had whipped up, the "wall",

if there is any, is plausible at certain tide times but not a real issue unless you hit it sideways, the key being, travel faster than the current to maintain steering control.

Bottom line by my reckoning we set a time of 3pm to be on the open ocean side and by the boat's ETA



A small cave complex of short interconnecting passages via reef holes connects to the main hole. You can scooter through, ends up looking into the hole via the upper coral rim... (see part 2)

calculations we would barely make it. So we made alternate site plans. Any attempt on the next day to cross would also be limited. You can't take on a channel easterly in early morning with the sun in your eyes because you can't see the reef. So it would be a full 24hr hold up... The alternate plan had slight issues

ending up in unpredictable currents on the wrong tide, sorting out dives & sites would be very sporty...

This was the tone of the trip: places to be, issues to face, and no idea what any diving conditions or the sites would be like... that's our life for the next eight days...

Just after 2pm was the first attempt to cross into the channel. We went from 30 metres into 12 metre shallow reef area that caused massive Eddie whirl pools. Scott our skipper knows full well that they can have a 100 tonne boat doing 360s to the



On the divers return you know some thing is wrong when you see air bubbles rising. In simple terms a diver has gone onto open circuit bailout, naturally we send a dory and deploy more tanks and send a diver to investigate.... a little melodrama to end the day...

thrill of the customers, not so thrilling for the skipper. Basically getting out of trouble is a lot harder than getting into it.

The second attempt was closer to the reef hardline, 30 metres drop to 70 metres then 90 metres and we were in the channel doing 12 knots committed. There was no way back. The swell more like series of rapids in a river as we passed Barrier Star on our left a mere few hundred meters over the hardline. At 3pm we rounded reef corner and it wasn't hard to spot the hole.

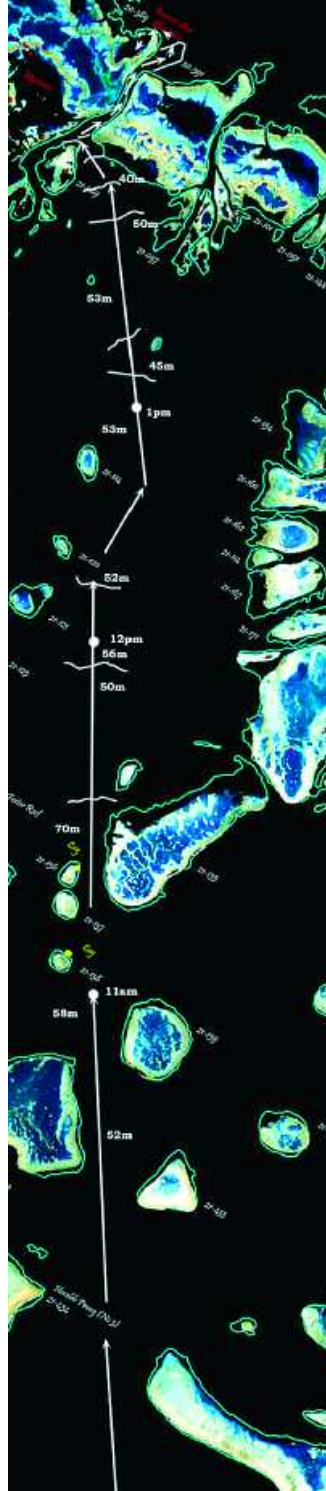
The boat anchors further in the reef in more sheltered waters. A dory is dropped in for a quick look and it was a bugger to find the site again in the setting sun to drop a shot line & pinky. It was however, achieved...

Monday 7am. Tides are factor and we had time to kill before the next change. The M7 Norval is a round hull boat fitted with outrigger stabilizers and is a very stable boat. Interestingly, the boat violently rolled sideways when the current changed, tossing you around for a minute or so as it swung to compensate - a very useful quirk of the boat for tide changes. The stabilizers also noted the surface current, the more current, the more extreme the angle.

While we waited Dave, Kevin and I fitted a dory out with sonar and GPS and motored around a section of the inner lagoon area checking out anomalies in the satellite images - you never know. As the current was coming in, we awkwardly ended up on the "water wall" built up by swell not breaking - a very surreal place to be in a dory. The wall only moves up & down, like a clear-cut terrace made of water.

Monday 10am. The current has changed to outgoing, so the Norval is moved and anchored nearer the hole. An outgoing tide is bad in that the "flood" may sweep the divers over the hard-line, but the positive is that the swell is held back on the outer reef hardline and as the tide recedes, current diminishes.

So, at the end of the day when



divers surface after their deep dives, the conditions are perfect!

Well that was the theory... I must admit as we anchor looking at this washing machine of wind chop, current going in the opposite direction and being slammed by swell curling in round the reef corner from another directions the dive plan, was looking a little dubious. At this stage of the tide my concern was if the current was ripping the divers may only have mere seconds given how close to the hardline they would be, before being swept over it... all bad.

Another plan was formed - given that I was in side-mounts - with a lower profile. The odds were better for surviving any keel hauling effect ending up intact. Besides i just didn't want risk another diver. For safety we had an anchor to boat line in place to pull the mothership round into a better position. With a stern to anchor diver's line in place, pinky and shot line in and a recovery dory ready to go, I took a leap of faith. As I went down the anchor I found a 3m shark circling the anchor. It then circled me for a time before peeling off to drop down the edge of the hole into this black abyss. I was quite impressed, - the visibility was only 15 metres but there was no current. Later we worked out it was the same principle as putting your hand near a vacuum cleaner, within a small area get to close to the hardline and your history...

I did a short dive, surfaced and reported all was cool and there was a nice big shark in the hole. The days diving got underway. I didn't recognise the shark type. It was sandy brown in colour and he

looked harmless enough, though unusually curious about a diver with his very broad head, his face was snarled and the top of tail missing, nick-named him stumpy....

By the end of day's diving there were more minor sighting of different sharks, Samir found a small passage in the wall at 43 metres, Craig had been to the bottom and explored two-thirds of it. He reported the maximum depth was 87 metres and that there were not noticeable passages or leads. I had run out of tape and surveyed the top of hole. Dave while on deco with too much spare time hatched a plan to test the team and popped his marker buoy... The result showed a weakness, while the divers did carry bail out gas, the dory wasn't set up to deal with a trimix issue and helpless to assist in the confusion. It got sorted with a standard scuba rig, more bail-out gas in different mixes, a shot line & pinky. Now with hindsight this became standard in a dory before a diver entered the water...

Late in the afternoon the boat pulled anchor and moved a kilometre back into the reef lagoon. Stumpy followed and hung around close to the boat, though many guesses as what type of shark no one was sure. A bit of night fishing saw Stumpy get a feed along with more serious sharks in attendance. For us every meal was a feast and with nightly beers in hand a time to relax and chat.

Tuesday 6am. Today was the day to get into diving the hole and get the boat back into position, Stumpy naturally followed and on my first dive I dropped down a stern line setup to the floor at 16 metres under the boat with Stumpy doing his circling thing round the line. With a DPV we had a bit of cat mouse game for 20 minutes before he got jack of it and with one flick of his tail he was gone.



With hindsight Stumpy is a Tawny Nurse Shark or Sleepy Shark... Common with a short range habitat of around 18Sqkm, docile and apparently when annoyed will react by grunting or spitting water at its tormentor...which is better than a bitty version spitting body parts...

With all the play and circling I was lost over coral sands and only just got started in the right direction when Stumpy came from behind just shy of my shoulder passed me. You jump out of your skin when a bugger does that and it left me paranoid, looking over my shoulder for ages. Four of the trimix diver's setup to a deep cross-section survey of the floor of the hole and were not coming back any time soon. A large school of fish had moved into hole and was content to remain there all day... everyone was just having a good time and doing what they wanted to do..

Even though our visit was brief we learned a lot about Barrier Star Blue hole. The only other expedition that I am aware of occurred some 14 years ago by "Quest" who used a mini submarine to explore as well as divers to make a film on Blue holes. (see pic below).



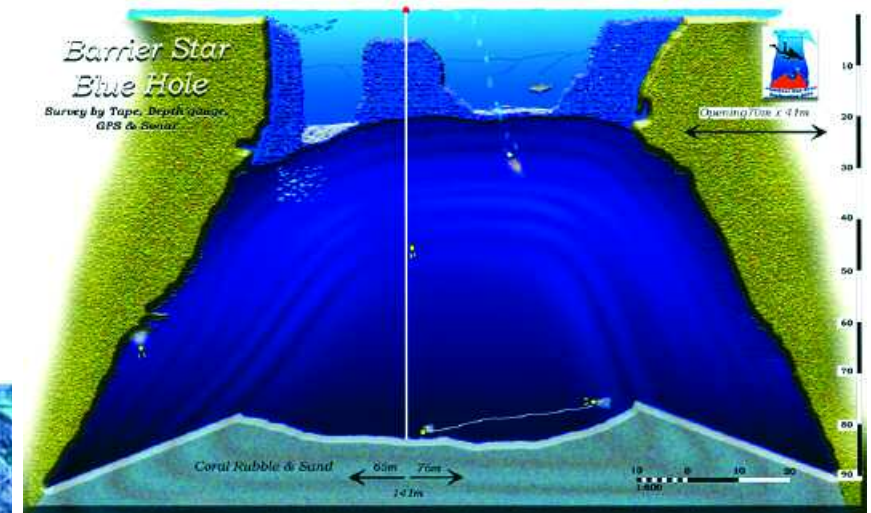
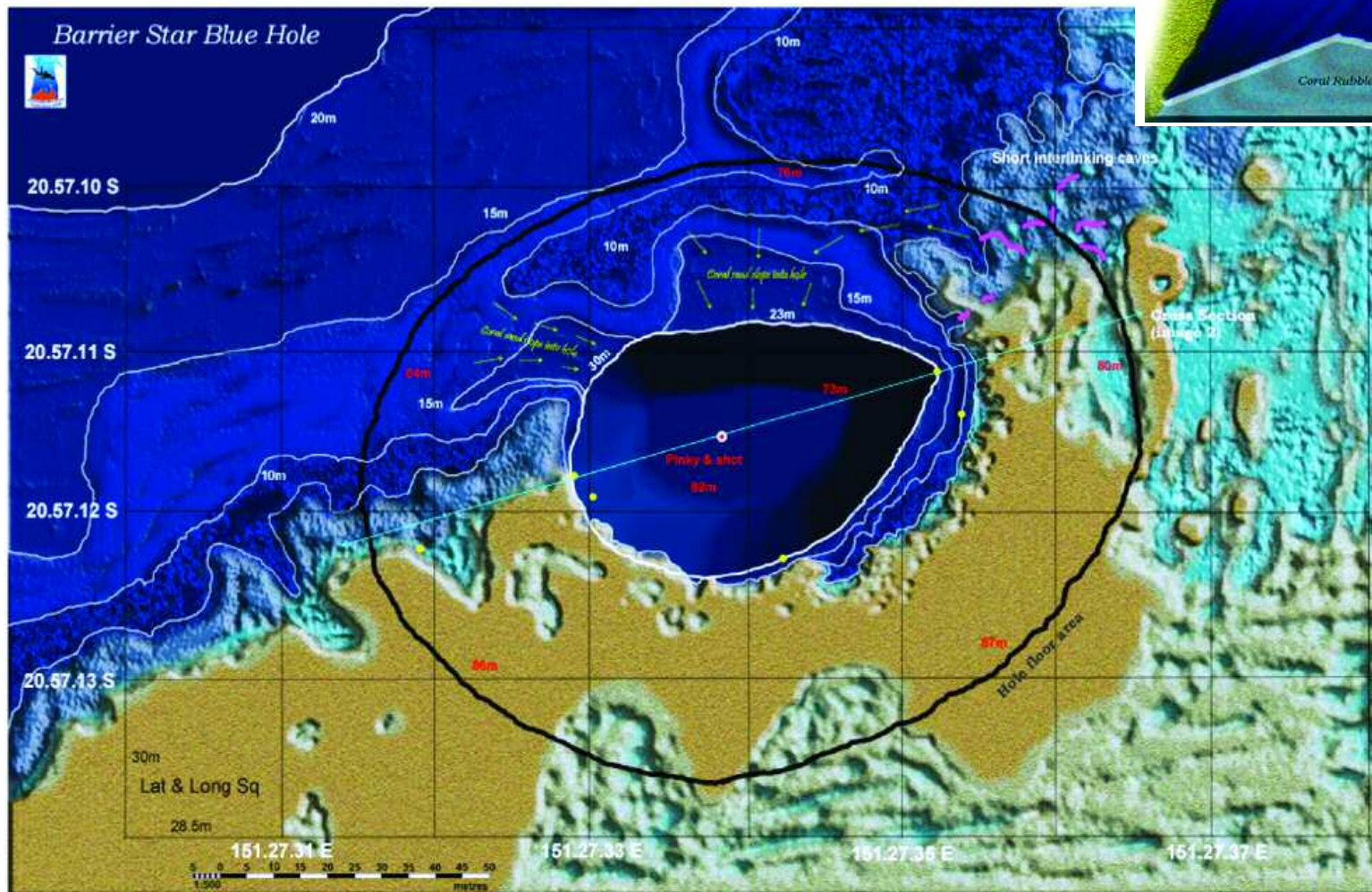
There is too much area involved within the hole and the walls are littered with nooks and crannies to say there is no dive-able passage. We can only say no large leads were noticed.

In contrast to the Quest trip, our divers found there was current at floor level, which could mean a connection to the channel some 700 metres away via a passage or fracture? However it seems more likely when adding in the Quest's results of a dye trace in which the dye travelled vertically in a column down to the centre of the hole, that there may be a whirl pool in the hole.

Map of Barrier Star Blue Hole next page.

Life in the hole like Soft corals seems more related to the lack of available light and food than the hole being anoxic. A small but healthy population of giant sea whips at 35 metres. There was a scattering of flat-form soft corals on the floor and no dead marine animals reported on the floor.

It would get rather lengthy in a deep and meaningful way to explain the existence of the "hole" in a living reef in detail; however it is a classic example.



The bottleneck is most likely the old reef floor. The reef has grown upwards 8 to 20m over the past 8,000 years to form the current coral rim.

The original hole floor rock-pile buried under the above process by coral sands... most likely around -32 metres.

The origin of the hole around 170 metres deep...And that's the trick... To find a "hole" that goes further back in time. Most likely the smaller the entrance the deeper the hole.

'At 39 Meters'

by Tom Smith, 8th January 2010

A small alarm sounds as we turn the last bend.
A short time remains - almost time to ascend.
At thirty-nine meters my breathing is slow.
Cascading on the ceiling, my air bubbles blow.

The end of the tunnel now meters beyond.
Etch an "O" on the wall - arm extends like a wand.
A few seconds pause and the signal returns.
To know all is well is what a cave diver yearns.

Only minutes left now, but enough time to ponder.
To memorise this image - there's no time to squander.
The cascading shadows, the reflection from boulders.
My own shadow cast from my feet to my shoulders.

Deep blankets of silt lying dormant, unstirred.
Hold your trim steady - left untouched is preferred.
Trapped air moving upward like mercury rising.
Settling beyond - an airlock comprising.

The water so clear it's like hovering in air.
Perfectly still you scan and you stare.
You watch a small rock drift away from the wall.
The most simplest things will always enthrall.

Switch out the lights for one moment of tranquillity.
The darkest of darkness leaves zero visibility.
Now shoulder to shoulder in a tiny dark room.
Hovering like twins in our mother's womb.

The closest alignment to peace one can find.
An exhilarating method to relax and unwind.
Your mind like a cave, you explore your own realms.
Release all your thoughts, it soon overwhelms.

At thirty-nine meters there's no chance to speak.
No phones or televisions; no problems of the week.
No harshness of summer and it's blistering heat.
No storms of the winter; or piercing spring sleet.

No sounds of small children at play or at war.
No bills to be paid; you now can't ignore.
But stick to your plan and in touch with your two.
Be aware of his actions as he is with you.

The alarm again sounds and breaks the serenity.
If we don't turn back now, we'll be condemned to brutality.
As the comfort; and beauty; and bliss of our room.
Could turn into evil - then forever our tomb.

And then a small click - our light beams ignite.
My pupils dilate from the reflection of light.
A brief pause is taken, and equipment now checked.
Keep buoyancy perfect, give the cave some respect.

Move back in the tunnel and retrieve all your line.
Don't stray from your path, more passages entwine.
Hold your form steady, leave silt in its place.
More divers soon follow to visit this space.

With each corner turned and passage hence followed.
With rooms since explored and side tunnels wallowed.
We never diminish our desire to know.
Where *does* this cave lead, what's beyond that next shadow.

As at thirty - nine meters you'll reach pure bliss.
Ask all those who have been there, there's nothing like this.
Don't try to compare this with ocean dives seen.
A cave takes you somewhere, your mind's never been.



Hi All...

The past 3 months have flown by and I have even managed to get in some enjoyable diving.

On a sad note, Max Marriott, a good friend, diver and Instructor, passed away recently as a result of a long battle. It was certainly pleasing to see the representation of the CDAA at Max's funeral. Heike Apps gave a moving eulogy with regards to his cave diving exploits and many more of these were discussed at his favourite hotel afterwards.

Currently Peter Buzzacott, Dene Buckley and Pippa Waterworth are involved with a study being held on a fish found in the Nullabor Karst region.

There is also a study on temperature and salinity in the caves, so if you are out there, please do not move any equipment that may have been placed there. More information will be passed on shortly.

Misha Temple has been appointed to the Victorian State Rep position and he has already been very active in the organisation of workshops for the Victorian divers. Ken Smith has also been active in organising a rebreather workshop in SA. This will be held on March 21st at 11:00 am sharp at Southern Dive Centre, 1 Roy Tce, Christies Beach.

- PROGRAM: 11am Talks on History and Technology of Rebreathers.
- 12-2pm Inspection of a range of rebreathers and discussions with owners.
- 2PM Some in water demonstrations, barbecue and socialising.

Hopefully we will be able to have these workshops replicated in the other states.

We are currently in talks with a few landowners in regards to cave sites and hopefully by the time that you are reading this, some exciting news should have been announced.

I need to thank Darren Walters for his assistance in organising a cleanup at Hells Hole at very short notice. A complaint was received by the local government, so this needed to be done quickly. Another clean up day will be held later on this year, to complete the task.

Site improvements - there are numerous site improvements that need to be done at many sites, including things like change tables, shelter sheds, steel steps into the water, access steps to and from the water and toilets. These items would be great if they were able to be installed. However many of the sites are owned by the Councils or Governments. They see these improvements as liabilities that they would then become responsible for, if something was to happen (e.g. someone getting hurt etc). There is also an Occupational Health and Safety issue with these type of improvements. After approaching some private landowners with the idea of cutting steps into sinkholes to make easier and safer to access them, we have been told "If you cut any steps, fit tables or a shelter, access to the site will be removed".

So you see, while we as divers, see a need to install some of these improvements to the caves and dolines, the land owner does not. We are still trying, and once in a while, we get a win.

If you have any ideas regarding improvements, that you would like to see, just drop me a line and I will see what we can do. Remember access is a privilege, not a right.

Safe Diving, Rob.

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RECORDS AND PUBLICATIONS

JASON CALDWELL



Well, it has been a busy time in the past few weeks.

Not one to sit idle and take it all as gospel truth, I've set about getting quotes for the printing cost of *Guidelines*, which is one of the Association's biggest expenses. Now, I am very pleased to announce that I have managed to negotiate the figure to substantially less than what it was costing us to print it and I have this rate (+ CPI) locked in for the next 5 years. This edition, 111 is printed using the new printer.

The only difference is that we have reduced the page thickness very slightly as the previous stock was a little thick for the publication to sit flat nicely. To celebrate the new printer and the increased colour, Dave has tweaked the cover fonts to freshen it up a little. Systematically I will go over the entire publication and continue to add value to it and offer the members increased benefits.

From now on, we will print 48 pages of full colour. Previously it was 40, 44 or 48 pages and the mix of black and white. More colour, means more stories and more room for photographs – so please feel free to submit them to me at caldwellavt@bigpond.com

Deadlines are now easy, 20th of the month prior

to publication, if you miss it, it will go in the next one. Dates for future issues are as follows....

- 20 May for June • 20 Aug for September
- 20 Nov for December

Advanced Cave:

The new CDAA website is currently in the beta testing stage and our new webmaster Damian Georgiou has put a considerable amount of time and effort into moving the CDAA into the modern age with a very professional looking website design. This guy is a human code machine and has intuitively developed a fully integrated site with a common look and feel throughout. We have a new dedicated virtual server and the CDAA website will be able to handle multimedia considerably better now. The forums have replaced the old E-mail list. The Directors will still be able to group E-mail you with important announcements. I'd like to thank Tony Richardson for his ten years of service to the Association.

The Regulations have also been updated and all members are encouraged to download these and familiarise themselves with them.

Dive safe and enjoy. Jason Caldwell

• Articles for Guidelines •

- Send articles preferably by email to: publications@cavedivers.com.au
- Email to publications@cavedivers.com.au and seapics@alphalink.com.au
- Text files should be saved as Word files or Simple Text and pictures as separate jpeg files. If mailing please send pics and text on CD. Send 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.

Fossil Cave Megafaunal Discovery & Retrieval, 2009.

Neville Skinner, Jan 2010

For me the discovery of important megafaunal bones had started with a dive in Fossil Cave (5L81) back in August 2008, at a time when Matt Skinner was preparing for his CDAA Penetration (Advanced Cave) course and keen to dive as many sites as possible. Megafauna relates to large animals (mammals and flightless birds), usually heavier than 30kg, that have become extinct since the last ice-age, i.e. from 1.6million to approximately 10,000 years ago.

The '5L81' refers to the official cave reference number recognised by the Cave Exploration Group (of) South Australia (CEGSA) Inc., replacing its original south-east reference number "S123" in the mid-1970s with its Lower south-east number of "5L81" ('5' referring to the state of SA, 'L' for the Lower South East, and '81' because it was the eighty-first cave registered in the then newly-defined LSE area).

Until recent times the recorded name for Fossil Cave was "The Green Waterhole"; although it has also been referred to as the "Greenwater Hole Cave" in some past reports. I imagine this naming was because of the green plants that grew from the water's edge across the surface, combined with the green moss that grew on the rocks and the ever-green foliage within the doline. When horses were the normal mode of transport a hundred years ago, they probably drank from The Green Waterhole, and likely fed on the green grass that grew in the doline, supplemented by the apples that were planted along the roadside for that purpose.

During the writing of this article I wrote to fellow cave diver Peter Horne asking for clarification on the Green Waterhole name. Peter had compiled a considerable history about the feature through coordinating a major mapping and bone-retrieval project in the cave during the late 1980s, and he subsequently informed me that in the South Australian Government Gazette of 4th May 1989 (page 1215) it was "recommended that the names Goulden Waterhole and The Green Waterhole be altered to Goulden Hole and Fossil Cave respectively". I am presently waiting to hear if this eventually happened

(it is possible that it may not have), and if so, when. Readers ought to be aware of the cave renaming since the significant discovery of fossil bones there in the 1970's, as the name "Green Waterhole" remains valid for searching on past articles.

Earlier in 2008 Bruce Bulled discovered a new room in Fossil Cave, which he had shown to Matt and others on a previous dive but which had not yet been fully explored. This was a good opportunity to explore this new room. After entering the water Matt reeled and I followed. Following the obligatory check of the main area of the cave, we headed to that part of the cave where the new room was located. When I first saw it I realised why it had not been discovered sooner – it was a well concealed opening, about 400-500mm across, between rocks that led into a small room.

Matt shot into the entrance of the small room like a rat up a drainpipe, with me close behind, until I realised there may not be enough room for the two of us. At that point Matt had hardly gone 2m in to check out the room and was now on the other side of it. Perhaps I had over inflated my expectations a smidgen I was thinking, as I waited for Matt to find a space to turn around before heading out again. While Matt stopped to investigate a window in the floor I noticed a tunnel heading off to my right, which had a few bones sitting on a ledge adjacent to its entrance (see pic1) that Matt had not yet noticed.

As Matt was swimming toward me ready to leave the room, I flashed my torch at the tunnel entrance, and since Matt had the reel he entered the tunnel

first with me in close pursuit. It was evident from the silt pouring down from our bubbles, and the white silt mounds half-blocking the tunnel entrance, that no-one else had previously entered that area. We could see that the tunnel went for several metres and appeared to open out into another room.



1. Silt pile at bottom of fissure, on ledge at entrance to tunnel (NRS)

Taking great care not to disturb or damage any bones that might be contained in the silt mounds blocking the tunnel, we carefully pushed these aside and pulled our way in (by now I'm quite accustomed to following in zero viz). Matt continued to the end of the tunnel that widened as we entered, then dropped down into the lower corner section and poked his head into a second tunnel. Wow! Everything in this section was covered in totally undisturbed virgin silt, which meant that very quickly silt was raining down from the ceiling at an increasing rate. I watched from the side and above as Matt disappeared into the lower section tunnel, now almost hidden by silt. At that point I reassessed whether I should stay where I was as this would likely result in an untidy collision with Matt on his return, so I decided to move back to the tunnel entrance and wait for him to reappear, as it would compromise diver safety to blindly follow.

I was very pleased for Matt because he had been trying desperately to get into another area nearby that I now believe might be linked. Perhaps this was the lead Matt had been searching for all along. When Matt reappeared, grinning from ear to ear, we both exited the cave and agreed to come back another

day and check this area out further. Matt told me he had travelled another 2-3m to the end of the tunnel, but it had become too silty to see much detail.

It was not until May 2009 that we eventually returned, due to Matt having to complete his Penetration course, after which our focus switched to diving Pen-rated sites for several months to achieve Tank Cave access for Matt. This time we headed straight for the new area, where Matt reeled into the tunnel while I explored the area of the first room adjacent to the tunnel entrance. To my surprise, I realised I could see Matt down below me through a gap in the rocks. I shone my torch down at Matt as he was looking in the direction of what appeared to be a megafauna jaw, along with other bones directly in front of him and signalled to him not to touch them.

Matt was clearly very excited on his return and we exited the cave feeling very pleased with ourselves. We then discussed the importance of not touching the fossils because they would be extremely fragile and may fall apart when handled.

Most divers are not aware that ancient fossil bones become the property of the state museum in the state in which they are found, the instant they are removed from the water. (In our case, special arrangements were made by Flinders University to have these specimens located at the University, rather than at the SA Museum). It is illegal to remove bones from sites without permission and an approved collection permit. Fines can be imposed by the SA Government on divers removing fossil bones without these approvals.

As mentioned previously, fossil bones can be very fragile and may fall apart when removed from their gravity-free environment. Bones should not be removed to the surface until arrangements for their removal have been put in place that include containers to put them into, before carrying them through or lifting them out of the water. They can also become flaky and fall to pieces when they dry out. Old bones become very thin over time due to dissolution in the water. They need to be kept damp until treated by specialists. Never try to clean them underwater; this should be left to the trained specialists in controlled conditions.

The exact location of the bones must be recorded

before, or at the time, they are moved (refer pic 7). This information is vital in establishing links to previous or future finds in the same area that may be related. Sometimes fossil bones are discovered in apparently different areas and it isn't until later it is realised this is the same animal that has partially slipped into a new position due to subsidence or interference by another animal. After the fossil bones have been removed a marker is usually left behind to identify the area where the bones lay in case additional follow-up checks for 'missing' bones are required. These markers are also useful links back to written reports regarding the location of bones in the past.

I suggested to Matt that we come back with the camera and document them before they were disturbed by anyone. Matt was concerned about the possibility of other divers damaging the bones when entering the confined space where they lay. The following month we returned with Matt's camera, and this time we both entered the confined area at the bottom together. I could see from below and behind Matt that he was having trouble holding the light and taking photos of the jaw at the same time, so I moved forward underneath him just as he set his primary light aside to take the photos using internal flash. Matt was quite surprised when suddenly my light appeared on one side of the jaw being photographed and his light appeared on the other side, providing underwater 'studio' lighting on-site!

Once Matt had photographed the jaw for identification purposes (pics 2a and 2b), seemingly from every conceivable and imaginable angle, we carefully returned it to the exact spot from whence we had found it.



Pic 2a:
Location and ID
photos of first
Sthenurus jaw
taken in-situ (MS)



Pic 2b:
Jaw replaced in
silt where found
after ID photos
taken (MS)



Pic 7: location of the second *Sthenurus* jaw marked after removal (NRS)

Matt then emailed the images to Mr. Steve Bourne, DEH Deputy Regional Conservator for the South East Region, for identification. Here's what Steve said:

"It's Simosthenurus occidentalis, one of the extinct browsing kangaroos. Gavin Prideaux from Flinders Uni ID'd it to species. Limb bones are more than likely the same animal. Discussing with him about possible collection. There was a complete skeleton of this species recovered from there a few years ago. Good find though."

Steve then began the process of obtaining Government approval for the removal of the fossils from the cave to Flinders University of SA, where they could be examined by Dr. Prideaux and hopefully linked back to the other specimens taken from the same site over the past 30-40 years.

According to a detailed research report by the South Australian Underwater Speleological Society Inc.1, fossil bones were first discovered in Fossil Cave back in 1964 by Mr. G. McKenzie, which subsequently resulted in many fossil bones being located and removed from the site in January 1968 by McKenzie and Brian Brawley, "including six extremely well-preserved sets of skulls and jaws". This discovery was reported in "The Border Watch" newspaper on 27th February 1968, and resulted in further expeditions taking place later in 1968, early 1969 and in June 1974. Following the discovery of more bones in the cave in late 1978 by divers from Flinders University, the area was thoroughly checked using a star-picket grid pattern to assist in recording bone locations. During this search a "nearly complete and excellently preserved skeleton of a *Sthenurus* kangaroo" was found, and it was the assemblage of this skeleton that showed the species was "in fact relatively short, stocky, large-necked animals".

Sthenurus (Latin for "Strong Tail") is the name of the genus to which the species *Simosthenurus occidentalis* belongs. These are believed to have been extinct for

50,000 years. An impression of what this browsing kangaroo looked like and more information may be found on the DEH website at .

It is a credit to those early cave divers that complete skeletons were still able to be removed from on top of the rocks in Jan 1979, some 10 years after these sites had become popular dive sites, and almost 6 years after the formation of the CDAA. It is the remains of 80 star pickets and 750m of line that were installed in Fossil Cave during the Christmas break of 1978 that can still be seen in the cave today.

Upon seeing pictures of the jaw found in Fossil Cave in 2009, Mr. Neville Pledge (Senior Palaeontologist, SA Museum) said "The specimen certainly is 'megafauna'; it is a jaw from an immature sthenurine, possibly '*Procoptodon* *occidentalis*'. [used to be *Simosthenurus occidentalis*.], but I can't be certain without examination and measurement."

After negotiating with Steve Bourne, as well as Dr. Prideaux and others, it was agreed we would remove the fossil bones on the weekend of 15-16th August 2009.

We also invited cave-divers Mark Nielsen, who had been involved in previous bone retrievals from Fossil Cave, to join us and share his expertise, and Grant Pearce as well as CDAA Site Director Rob Brennan who was not able to make it that weekend.



Pic 4: Bone deposits at end of tunnel, in lower area (MS)

Matt Skinner, Mark Nielsen and I started the day late on the morning of Sat 15th August with a pleasure dive in The Pines to ensure our gear was ready for the dive later in Fossil, hitting the water at 11:45am.

We did not want to start the dive in Fossil Cave in the company of the landowner and others to find we

had gear issues. Not that we expected any of course. We were also careful to avoid decompression obligation as we were prepared to spend considerable time under the water, and we knew we would be bounce diving for the time we were there.

On arrival at Fossil at about 1:30pm, we went straight in so Matt could take some video footage of the area, before coming back out to await the arrival of the others.

Grant Pearce was expected to arrive first, followed by Steve Bourne (DEH) and Dr. Prideaux who were coming from the Naracoorte Caves to receive the fossil bones from us as we brought them to the surface. We did not want the responsibility of taking these back to Adelaide with us for fear of something happening enroute.

Grant arrived around 2:30pm or thereabouts with the marking pen we needed to mark our removal containers. We used the extra time to brief Grant on how we planned to remove the bones and get them to the surface safely, and to ensure we were ready to hit the water.

Once Steve and Gavin had arrived, we spent 10-15 minutes discussing what they wanted (in terms of silt samples, etc) before donning our dive gear once again. Silt samples are required to allow chemical/geological analysis of the immediate environment in which the bones are located. If analysis of the bones reveals the presence of any unusual elements, then the silt may be tested to ascertain whether the bones have been contaminated by their surroundings.

Matt, Mark and I entered the water together, with Matt & Mark 'de-fossilising' the tunnel area together, and myself in the main chamber area and off to the side. It was clear from the beginning there was no room for three divers inside the tunnel, so we agreed before hand that I would remove the fossils from outside of the main rock pile and adjacent to the tunnel entrance which we believed may belong to the same animal. I also spent some of this time checking the rock-pile over to ascertain how the fossils made it into where they were found. During this time I noted I could see Matt's light inside the rock pile from the top, looking down through a 300mm wide vertical fissure in the major section of rock that forms the bulk of the rock pile. Presumably this fissure was created when the roof section fell down onto the rock-pile and broke, but I still found it extraordinary that the two sides of the fissure appeared to be so precisely parallel over their considerable length (10m) and depth (4-5m).

Steve and Gavin were on-site from approx 3:10pm

until 4:15pm. Before they left I advised them that a second jaw had been discovered that was in excellent condition, with all teeth intact, and that this would be retrieved next, but unfortunately they had run out of time and were unable to wait. They agreed for us to drop the remaining bones off to them at Naracoorte Caves on our way back to Adelaide, rather than expecting them to return the next day at 5pm to take delivery of same. This would not only save them the cost of the return trip plus 2.5 hours travel, but would also put us an hour ahead of schedule on our return journey.

It was shortly after Steve and Gavin had left the site on the Saturday that I removed the second *Simosthenurus occidentalis* jaw, which was indeed a fine specimen. I made no attempt to clear the silt off the jaw prior to removal, as the coating of wet silt helps to prevent the bones from drying out. We wrapped the bones in chemical-free paper provided by Gavin, and then wet the paper to prevent the



Pic 5: Second undisturbed *Simosthenurus* jaw prior to removal (NRS)



Pic 6: Second *Simosthenurus* jaw after removal, covered in black silt (NRS).

bones from drying out. I am aware that it is not good to wrap fossil bones in newspaper and the like, because printers ink and kerosene can contaminate the bones and render them useless for DNA sampling if required.

We finished up around 4:45pm that afternoon; Matt was running low on air and we were all keen to ready ourselves for an ale and meal. All the bones including the jaw were carefully placed on paper in separate plastic bags according to location; the bags were labelled and then put into a cardboard carton that we (very carefully) took back to our lodgings for safekeeping. The carton spent the night safely stored under the bed.

Due to the extremely poor visibility within the rock-pile and the fact we were returning the next morning, we decided that rather than remove our guideline to the surface, we would disconnect the end of it at the surface and leave it at the 4-5m mark where it could not be readily accessed by visitors.

On Sunday morning we decided to go straight to Fossil Cave as it was apparent that if we were to get to Naracoorte by 4pm then we would have to be gone by 2pm or earlier, as we still had to return to Mount Gambier to pick up our gear. We also agreed this time it would be better to separate into three groups of one, to maximise private space and facilitate more efficient collection. Mark would focus on a potential new area we referred to as area #5 that was halfway between area #1 on the upper level and area #2 at the far end of the tunnel on the lower level. Matt would revisit area #1 near the entrance on the upper level, believed to be the source of bones falling into the lower level, and I would spend more time checking area #3 where I located the second *Simosthenurus occidentalis* jaw as well as further examination of the surrounding area.

Each area, typically around 1-2 square metres in size, was defined by a peg bearing the numerals 2009 for year of survey and a unique number within the range 1-5 (refer pic 7). This is done to mark each area and provides a reference/record for any future studies or expeditions.

On arrival at Fossil Cave on the Sunday, we reconnected the line and I took my camera in for a few photos within the rock-pile, to the end of the tunnel. Upon entering I was quite surprised at how milky the water was from the previous day. Taking care to not disturb the silt further, I very carefully swam to the end of the tunnel and took one bad-viz photo (Pic 8) before withdrawing and inviting Mark in for a look prior to recommencing the task of collecting the fossil bones as planned. Later, Mark also commented on



Pic 8: Silt pile at bottom of new area, directly below Figure 7 (NRS)

how silty it was in there.

On further examination of the surrounding area, I was quite intrigued by the deep fissure in the rock-pile. During the course of trying to see the location of the top of the fissure from below, a line with a jump reel at the end of it was left hanging from the top by Matt, but still we could not see this line from below. I believe this to be due to the build-up of deposition from above into the lower section of the fissure, which blocked the angled view to the surface some 3-4m further along the fissure, and that the key to finding more of the skeleton lies within this deposition at the bottom of this fissure. One would assume that much of this deposition would have occurred in more recent times due to the softening of the surrounding rock.

I was surprised to later learn that it was a distance of 20m from the entrance of the tunnel into the rock-pile to the far end of the tunnel; it doesn't seem at all like it when you are swimming through. Matt had marked his line and after getting out of the water had measured it to obtain an accurate measurement.

We left the site at around 2:10pm (I think) on Sunday and it was a rush to get to Naracoorte at 4:25pm, where the palaeontologists were waiting for us in the car park (we had rung and let them know we were on the way and running a little late). I was surprised to run into Dr. Grant Gartrell with the same group, but later learnt that that week was "Palaeontology Week 2009". This also explained why Gavin was busy at Naracoorte Caves that weekend and wasn't keen to do the fossil collection at that time.

Gavin was delighted with the second *Simosthenurus occidentalis* jaw that I had found sitting on a shelf in black silt in near mint condition (as good as it gets), but probably no more so than the rest of the fossils because each is just as important as the other in assembling the skeleton. Disappointingly, Matt was

not able to travel to Naracoorte with us as he was heading off in the other direction to Melbourne and was concerned about getting clear of the forests before dusk, due to the high incidence of kangaroos on the Victorian side of South-East SA.

After leaving Naracoorte Caves, Mark and I headed into town for a well-deserved feed at the local pub, only to find we were one hour too early for the pub meal we had been salivating for, so we settled instead for a feed at Pinkies Ribs. Afterwards I thought, not a good idea, too many bones...

We have been told that because of this discovery, all fossil bones previously taken from Fossil Cave and stored at the SA Museum have subsequently been relocated to Flinders University, where a research grant has been made available for a short-term contract position for a palaeontologist to sort and collate those bones, along with any others from Fossil Cave that may have been stored at Flinders University.

Of particular interest to myself was the way the new area seemed to have been formed. The ceiling and walls/sides are scalloped limestone, similar to what may be seen in most caves where the water has dissolved the limestone away leaving an ornate effect such as one sees in Tommy Graham's, Engelbrechts West and Tank caves, to name but a few. The 'floor' on the other hand is made up of boulders, some small, some quite large. So why are the roof and sides of the new area scalloped when the rest of Fossil Cave is smooth?

I believe that what can be seen is in fact the roof of the cave that has fallen down and landed on top of the original rock-pile formed when the current entrance doline collapsed. This would explain that large 300mm wide fissure, which I believe was formed when the roof came down onto the rock pile and broke, with the lower section sliding down the slope 300mm more than the section above it. It also explains that nice round, rather smooth, gently sloping bottom that can be seen when one stands at the entrance to the water-filled cave and examines the area under the water (only small sections of the large fissure can be seen from the top, since more recent roof collapses have added another layer of flat rocks that covers most of it over). This same effect can also be viewed by divers in several other places where there exist small rooms, many too small for divers to enter.

This suggested to me that browsing kangaroos would have possibly slipped and fallen down into the crack in the collapsed roof whilst searching for, or attempting to drink, the water at a time when levels were much lower than those seen today, before even-



Pic 9: Roof collapse on top of rock pile/boulders, showing subsequent roof collapses (NRS)

tually sliding down the slope into their final resting place.

The South Australian Underwater Speleological Society (SAUSS) report states "Greg Bulling and Chris Hales went to the cave on the weekend of October 18th (1987) and undertook an extremely valuable reconnaissance dive, locating a new and very rich bone site at the bottom of a 4-metre deep fissure." What wasn't clear in the report is whether the bones were removed by some means of extracting them from the top of the fissure (see pic 10), or whether Greg and Chris had actually accessed the same area as ourselves, thus obtaining access to the fissure from the bottom. However this seems unlikely, otherwise the two jaws and other bones would most certainly have also been discovered and removed at that time.

On January 18th 2010, I received an email from Dr. Prideaux who said "you guys collected a more encouraging bunch of bones than I first anticipated", and went on to advise that amongst the bones retrieved was the humerus (upper arm bone) of a

magpie-sized bird (not yet identified to species), a pair of lower jaws and several limb bones of *Macropus giganteus* (grey kangaroo), several limb bones of a wallaby, possibly *Macropus rufogriseus* (red-necked wallaby), pairs of lower jaws of two adult individuals of the extinct short-faced kangaroo *Simosthenurus occidentalis*, plus numerous limb bones, ribs and a vertebrae, and the most complete jaw ever found of *Palorchestes parvus*, the smaller of the Pleistocene marsupial 'tapirs'. Dr. Prideaux also said that there were "some important specimens that we already have that are missing bits", so every bone is just as important as the first. This was indeed exciting news; it meant our work was worth the effort and that our reward lay in the knowledge we had achieved something worthwhile for the world to share.

Acknowledgements:

Thanks to Bruce Bulled for discovering the new area, and to Matt Skinner for his work liaising with DEH (Steve Bourne) in the subsequent retrieval of the bones. Many thanks also to Peter Horne for his advice and guidance on who to contact, how to record the fossil bone locations before removal, how best to retrieve the bones without causing damage to them, for providing a copy of his original SAUSS Research Report (No.1), and for additional research of historical facts. And many thanks to Steve Bourne for organising the retrieval, and to Dr Gavin Prideaux for his help in the retrieval, collation and safe storage of the bones, and subsequent information about those bones included in this report.

Photos Copyright: Matt Skinner (MS), Neville Skinner (NRS)

References and Recommended Reading:

1. South Australian Underwater Speleological Society (SAUSS) Report #1: "Fossil Cave – 5L81 UNDERWATER PALAEOANTHROPOLOGICAL AND SURVEYING PROJECT 1987 – 1988". Author: Peter Horne?
2. CDAA Occasional Paper No 2 Sept 1981 (from topics presented at the CDAA bi-annual conference 22 Sept 1979). Pages 4-12 (Williams, Rogers & Hiscock).
3. (P. Horne)
4. Pg 6-8 (L. Reed / S. Bourne)

More reading may be found through a Google search of "Green Waterhole Cave" + Australia.



Pic 10: Looking down into the fissure portal from above (NRS)

MEMBERS GALLERY YOUR FAVORITE DIVE SITE

Send us some of your favourite shots and a brief quote about your favorite dive site... Contributors will receive an Oceanic Hollis Mask for their efforts.



This month features Guidelines' Graphic Designer, Dave Bryant.

OK, so I'm not a Cave Diver but I was certified in 1989 and have dived around the globe. One of my favorite dive sites would have to be Byron Bay. It offers spectacular photo opportunities and it does have a few small caves.... 'small caves!'

The closest I've been to diving real caves is Ewens Ponds and Manatees in Crystal River, FL. DB.



Above:
Manatee, FL
self portrait

Giant Snapper

Silhouette
Grey Nurse

Below:
Woobygong
Yawning

Kingfish, Byron.



EMAIL YOUR PICS: seapics@alphalink.com.au

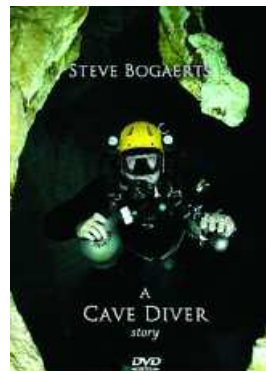
NEW DVD! A Cave Diver Story \$35

Author 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, all three of the planet's longest submerged cave systems are found on the Caribbean coastline.

Follow Steve Bogaerts through some of the most amazing cave diving footage ever filmed. Experience first hand the beauty and danger of cave diving on this amazing cave diving DVD. Purchase your copy of this stunning documentary filmed in full HD quality and experience the adventures into the depths of these massive underwater cavern systems.

Product of the Month
**Available
on the online store!**



Fantastic Book! Divers of the Dark \$75

Authors Antti Apunen & Janne Suhonen

Exploring Budapest's Underground Caves

Budapest is known for its spas. Their water originates from the volcanic earth. One of the most well-known springs is Malom Lake. It is a doorway to the cave system called Malnár János. Only a part of it has been explored so far. Nobody knows how far or how deep below the city the tunnels reach.

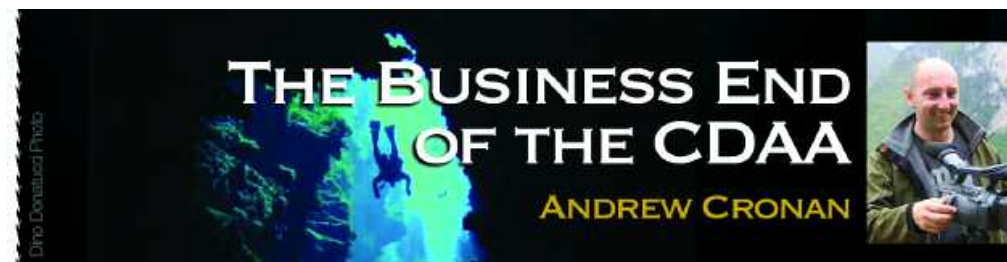
Divers of the Dark is a unique journey into an underground world that only a handful of people have visited. The magnificent photos take the reader on an adventure into the depths of an inactive volcano. The caves are a prehistoric nature park that has been formed over millions of years. The photographers took their cameras to places where nobody had ever been before.

Divers of the Dark tells the story of journeys many kilometres under the ground, of near miss situations and incredible human achievement. It will give the reader a whole new view of the life and surroundings of Budapest.

The book is an exciting, fascinating introduction to cave diving in Europe. Its photographs give a rare insight into an underwater world. The book also takes the reader to the József-hegy dry cave in Budapest and the water filled Ojamo lime mine in Finland.

To view or order any of these CDAA Products, please visit the Online Store or complete the mail order form in Guidelines.

Happy Diving, Tara Parkinson, CDAA Products Officer.



Hello, My name is Andrew Cronan and I have been asked to perform the role of Business Director for the CDAA until the next election. I would like to thank the National Committee for their offer and want to assure you I take this role and its responsibilities very seriously.

I'm from Sydney so I hope to be able to bring a more northern perspective to the Directorate and hope to represent the interest those members living outside of Victoria and South Australia as best I can. I have only been a member of the association for 3 years, partially because being so far from Mt Gambier I struggled to see the benefit in being part of what I perceived to be a Southern Australian Association. I have since seen the benefits so I think I am well placed to start to communicate those benefits to others who were trained overseas and wonder whether they should join the CDAA or not. I was involved early on in the discussions around the creation of a crossover from other training organisations and have now done those at both cave and advanced cave. I've been fortunate to dive caves in the USA, Mexico, China and naturally Australia.

My background is in management consultancy and I have spent the past 20 years working with organisations helping them improve their customer service and quality while simultaneously reducing their expense. I've lived and worked in New York and London and have advised dozens of large corporations on how to improve.

I expect it will take a few weeks to orient myself and get up to speed on processes and procedures but please don't hesitate to contact me at business@cavedivers.com.au if there is anything I can help with. I may not know the answer to your question but I will find out for you.

Next Steps:

Reviewing the subcommittee recommendations and

the strategic directions document and developing a plan with actions, timescales and responsibilities.

- Establishing a rigorous budgeting and reporting process
- Audit the current governance and financial processes of the CDAA
- Improve the communication to members of the business aspects of the CDAA
- Identify opportunities for cost reductions to members or increases in benefits

Like everyone here I have a great love of diving and cave diving in particular and I'm excited to be able to play a part in an association that is full of passionate people involved in the world's best sport. I look forward to working with you.

Andrew Cronan.

FOR SALE
V-5000 HID
4AH NiMH batteries,
10watt fixed focus beam
International charger



Contact: John Vanderleest
jfv@tpg.com.au 0419 775 771

CDAA INSTRUCTORS

NAME	Deep Cavern	Cave	Adv Cave	NAME	Deep Cavern	Cave	Adv Cave
A.C.T.				VICTORIA. cont.			
APPS, Heike (CDAA 2776) BH 02 6249 9170 AH 02 6291 0566 E: heike.apps@ga.gov.au	Yes	Yes	Yes	DALLA-ZUANNA, John (CDAA 236) Penetration instructor Phone: 0407 887 060 Email: jdz@paintandcustom.com.au	Yes	Yes	Yes
SOUTH AUSTRALIA				HARDMAN, Lorraine (CDAA 2824) Mob: 0418 304 120 E: PALdiving@people.net.au	Yes		
COSTELLO, Peter (CDAA 3378) Mob: 0417 494 771 soudiv@southerndiving.com	Yes			HIGGINS, Andrew (CDAA 3329) Mobile: 0413 569164 E: ah3329@gmail.com	Yes	Yes	Yes
SELBACH, Steve (CDAA 3495) Phone: 0413 134 827 Email: steve.selbach@mac.com	Yes			LESLIE, Paul (CDAA 3184) Phone: (03) 9879 2868 Email: info@melbournediving.com.au	Yes	Yes	
TAYLOR, Ian (CDAA 3568) Phone: 0411 118 134 E: ian.taylor4@defence.gov.au	Yes	Yes		McDONALD, Warrick (CDAA 1882) BH: (03) 9579 2600 E: info@abocean.com.au Mobile 0408 374 112	Yes	Yes	Yes
VICTORIA				MONACO, Rubens (CDAA 1731) BH 03 5984-1799 E: info@idcscuba.com.au Mobile: 0413-429-533	Yes	Yes	
ALLEN, Terri (CDAA 3483) Mob: 0419 176 633 E: terri.allen@baker.edu.au	Yes	Yes		QUEENSLAND			
BARCLAY, Gary (CDAA 1735) AH (03) 5565 8793 E: garinda@tpgi.com.au	Yes	Yes	Yes	FEATONBY, Tim (CDAA 3372) Mob: 0402 129 253 E: tim.featonby@defence.gov.au	Yes	Yes	
BOWMAN, Jane (CDAA 1880) BH: (03) 9579 2600 E: info@abocean.com.au www.abocean.com.au	Yes	Yes	Yes	WESTERN AUSTRALIA			
CLARIDGE, Linda (CDAA 2214) Mobile 0408 052 070 E: garinda@tpgi.com.au AH (03) 5565 8793	Yes	Yes	Yes	PAYNTER, Geoff (CDAA 3784) Mob: 0407 445 112 E: gpaynter@geo.net.au	Yes		

INSTRUCTOR ADVOCATE: PAUL LESLIE.

TANK CAVE DATES... & A REMINDER...

A Tank Cave returning diver application form and a \$60 weekend fee will be required before any bookings can be accepted.

April 2 - 5 Easter. Jane Bowman
April 24 - 26 Anzac Day. Rob Brennan
May 8 - 9 Gary Barclay
May 22 - 23 Richard Irndorfer
June 12 - 14 Queens Birthday. Jane Bowman

UPCOMING COURSES

DEEP CAVERN Courses

April 1 - 30, 2010 in Melbourne & Mt Gambier ~ May 1 - 31, 2010 in Melbourne & Mt Gambier
Midweek or weekend courses. Flexible schedule. You will require a theory day, pool session and 3 days in Mount Gambier. Contact Rubens to organise dates that suit you. Only two students per course maximum. Twin tanks supplied if you don't own your own. Instructor: Rubens MONACO 0413-429-533

April 3 - 6, 2010 in Mount Gambier SA
Full time course in Mount Gambier SA. All dives- 4 training, 3 site dives, wire ladder climbing and rope handling workshop included. All specialised equipment supplied. For more info please contact...
Instructor: Linda CLARIDGE 0408 052 070

May 13 - 24, 2010 in Melbourne & Mt Gambier
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. Instructor: Paul LESLIE 03 9459 4111

CAVE Courses

April 1 - 30, 2010 in Mt Gambier ~ May 1 - 31, 2010 in Mt Gambier
Midweek or weekend courses. Flexible schedule. You will require a theory day and 3 days of diving in Mount Gambier. Contact Rubens to organise dates that suit you. Only two students per course maximum. Twin tanks supplied if you don't own your own. Instructor: Rubens MONACO 0413-429-533

April 24 - 26, 2010 in Mount Gambier SA
3 day full-time course conducted entirely in Mount Gambier. Includes all theory, 3 training dives and 3 site dives. For further information please contact... Instructor: Linda Claridge 0408 052 070

April 27 - May 3, 2010 in Melbourne & Mt Gambier
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. Instructor: Paul LESLIE 03 9459 4111

Advanced Cave

April 2 - 6, 2010 in Mt Gambier
Full-time Advanced Cave program run entirely at Mt Gambier. Please download the application form from the web site and pay careful attention to the prerequisite and equipment requirements.
Instructor: CDAA 0407 566455

June 12 - 20, 2010 in Mt Gambier
Advanced Cave Program will be run over two weekends - June 12/13/14 and June 19/20, entirely in Mt Gambier. Please download the application form from the web site and pay careful attention to the equipment requirements.
Instructor: CDAA 0407 566455

Please download the latest application form off the web page
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			
Ewens 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. <i>NOTE: Divers should renew their Piccaninnie Ponds indemnities at least 2 weeks prior to their intended dive date.</i>
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. 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 - Open Weekly. 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.
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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 TEMPORARILY CLOSED.
Blacks Hole	S/C	Scotts Agencies P/L	Mt
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 (Linda Claridge, 0408 052 070) Mt
Engelbrechts - East	C	Mt Gambier Council	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.
- West	P	Lessee Ph: 0418 133 407	
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. DY CER	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 (Anticline)	C	Affected by high CO ₂ levels during Summer/Autumn. Access is co-ordinated with the Wellington Caves management by Greg Ryan - greg@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.	

CDAA PRODUCTS ORDER FORM

	QTY / COL/SIZE	ITEM	UNIT PRICE	TOTAL
BOOKS		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	
BOOKS		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 you can't put down once you start, 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	
	NEW!	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	
BOOKS		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	
		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	
		The Darkness Beckons. By Martyn Farr. The history and development of cave diving.	\$75.00	
		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	

Please send to: Tara Parkinson

CDAA, Unit 2/7 Condah Crt,

Ashwood, VIC 3147, or order On-Line at www.cavedivers.com.au

	QTY / COL/SIZE	ITEM	UNIT PRICE	TOTAL
DVD'S	NEW!	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	
		Axiz 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	
DVD'S		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 Wyschnja. 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	
		Wookey 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 Wookey 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 unimagiablle dives, exploration divers push nearly 7km into the extreme depths of the Wakulla & Leon Sinks cave system	\$35.00	
POSTERS	NEW!	NEW POSTERS 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	including postage

CDAAs PRODUCTS ORDER FORM

	QTY / COL/SIZE	ITEM	SIZE	UNIT PRICE	TOTAL
CLOTHING		• Embroidered Crew Neck T-shirts. Black, Navy and Steel Grey - S, M, L, XL, XXL		\$25.00	
		• Embroidered Polo Shirts. Grey with black trim or black with red trim. Look very smart!		\$35.00	
		• Embroidered Hoodies. Black only - Sizes: S, M, L, XL, XXL		\$70.00	
		• Embroidered Trekka Jackets. Black only - 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. Sizes 8, 10, 12, 14.		\$25.00	
		• Beanies. Black only.		\$20.00	
		• Caps. Black only.		\$20.00	
MISC.		• 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	

Cardholders Name: _____ Order Date: _____ Sub Total \$ _____

Address: _____ Plus P&H \$12.00

_____ Postcode: _____ TOTAL \$ _____

Card No.

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☐ Bankcard ☐ Mastercard ☐ Visa

Expiry Date: _____ Signature: _____ Ph: () _____ Fax: () _____

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LIKE THE NEW-LOOK GUIDELINES?



MAKE IT LOOK EVEN BETTER!

**WHY NOT BECOME A CONTRIBUTOR
AND SEE YOURSELF IN PRINT!**

Just follow these simple steps...

- Send articles with high resolution pictures preferably by email...
- Email to **publications@cavedivers.com.au** and **seapics@alphalink.com.au**
- Text files should be saved as Word files or Simple Text and pictures as separate jpeg files.
- 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 jpg's.
- Once we receive the pictures, we'll advise if we need any in lafrger size.

GUIDELINES FULL COLOUR ADVERTISING RATES FOR 2010

**Guidelines will be printed Full Colour as of March 2010
but B&W Advertising will still be available.**

New Advertising Rates have been established, as follows:

Colour: Full Page \$350 Half Page \$250 Quarter Page \$150

Mono: Full page \$250 Half Page \$150 Quarter Page \$100

Full Page ads on pgs 2, 3 or Outside Back Cover = \$400 each*

*Must be booked for one year

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