



C.D.A.A. Newsletter

No. 122 - DECEMBER 2012

INSIDE...

- 2012 Symposium Pictures

PLUS...

Ian Lewis:

Weebubbie

and lots more!

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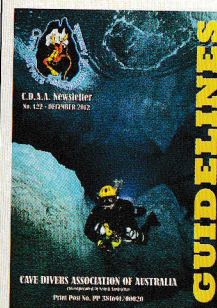
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Cover:
Webubbie.

Diver is
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Photo by:
Liz Rogers

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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 Publications Director, Email: publications@cavedivers.com.au

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'The Basic Rules of Cave Diving'

Through the study of past cave diving related accidents, researchers have found there are a number of common causes for these accidents. By becoming familiar with these causes, divers can learn to avoid similar accidents.

From the research, five main contributing factors have been found in over 90% of cave diving related fatalities.

These causes have led to the five basic rules:

- **Be Correctly Trained.**

In the vast majority of fatalities world wide, the divers involved had no formal cavern/sinkhole (Deep Cavern) training. Of those who did have training, most were diving outside the recognised limits of that training. Many open water instructors have died in caves.

- **Run a Continuous Guideline to the Open Water (Surface).**

In a large number of overhead fatalities, victims failed to run a continuous guideline from the open water. When silting took place or they became disorientated, exit was then not possible with gas remaining.

- **Always keep a Minimum of 2/3rds of the Starting Gas Supply for Exit when Entering an Overhead Environment.**

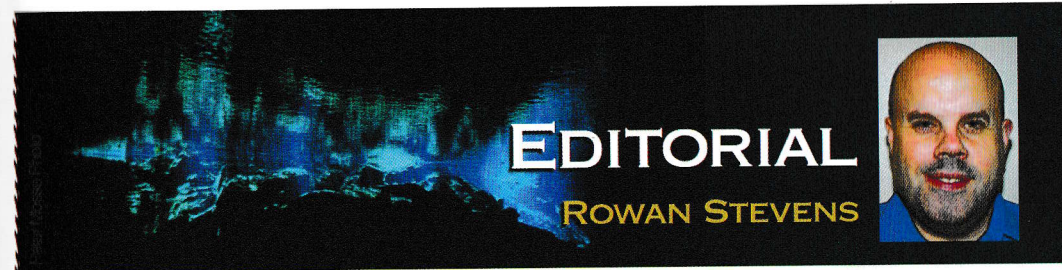
The rule is seen as the minimum in overhead environments and may not offer enough gas if trouble is encountered at the maximum penetration.

- **Always use a Minimum of 3 Light Sources.**

In cave diving this would be a primary and a minimum of two backups, all with the ability of lasting the duration of the dive.

- **Don't Dive Below 40m on Compressed Air.**

The CDAA's maximum depth limit is 40m. Of the trained, well equipped cave divers who have died, almost all were diving beyond 40m on air.



Dear Members,

We are in the last mile of 2012, hopefully the year that was for you has been one filled with lots of diving adventures whether salt or freshwater, shallow or deep, reef, rust or limestone. If not, well you always have 2013 to look forward to ... unless of course the Mayan's called it correctly and the world ends on December 21.

Anyway down to more pragmatic things, firstly I am happy to report that the last 40 years of the Association's training records and photos have now been catalogued, scanned and loaded online (see our 40 years of your training records). Early in 2013 new functions will be made available via the web site for you to view your training records.

All other paper records pertaining to medical health, renewal forms with credit card details, etc. have been shredded and burnt (which was about 18 large green garbage bags worth). Also, many member electronic records had incorrect endorsements, incorrect course dates and incorrect instructor details. These have now been fixed. A detailed audit of all records can now be performed and instructors will be contacted for any records that are missing. We will endeavour to prepare a report of interesting facts and insights pertaining to the Association's 40 years of training.

In this edition ... we have some photos from this year's AGM held in Mt. Gambier, an interesting article reviewing Ben's Vortex (the mystery surrounding Ben McDaniel), more from Ian Lewis on Weebubbie Cave, some words from Ron Allum on realizing James Cameron's Deep Ocean Dive and another DAN article – this one on medical fitness to dive.

The entire National Committee wish you a very Merry Christmas and a happy new year. May Santa fill your stockings with lots of diving toys.



**40 years of training records.
Many bottles of wine and coke
were harmed in this project.**

Rowan Stevens #3177 | Publications and Records Director
M: 0417 550 509 | E: publications@cavedivers.com.au

Articles for Guidelines March 2013 - Deadline is Feb. 15th.

- Send articles by email to guidelines@cavedivers.com.au
- Text files should be saved as Word files or Simple Text
- Pictures saved from digital cameras or scanned from photos must be at least 200-300 dpi at 15cm wide, RGB files, and saved as Maximum Quality JPEG's.

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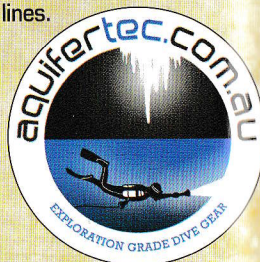


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NATIONAL COMMITTEE UPDATE

DECEMBER 2012

Hi and Merry Christmas to All

For those of you who missed this year's AGM, you also missed a full day of some excellent presentations. It was well worth the time and effort to be there.

With next year being our 40th Anniversary year and the National Committee wanting to see more activities outside of Mt Gambier, events and speaker presenters will be held throughout the country. Richard Taylor, founder and original coordinator for OzTek, has been asked to take the lead on this initiative.

It was wonderful to see this year, a solid number of voters. Linda Claridge was voted in as the new Standards Director, the new Constitution was voted in, as was a motion for a minute silence at each AGM to remember members who had passed away. Also voted into the Hall of Fame were Andrew Wight, John Dalla Zuanna and Ken Smith.

Our sincere thanks also go out to Jane Bowman for all her work as the Standards Director over the past three years. Jane was a valued member of the team and respected by all.

For those who did attend the AGM, you will have noted a strong bias towards the Roe Plain Caves in the Nullarbor. There has been a lot of exploration happening in the area, primarily lead by Paul Hosie under the ASF CDG banner. As a result, we now have a two more caves to rival Tank Cave.

However, unlike Tank Cave, these new sites are very fragile and will be managed accordingly. To this end we have been working with the exploration team to produce a video and secure access arrangements that will allow members ready access and allow us to meet our cave conservation objectives.

If we wish to continue to have the good access we have today, and wish to add new sites to our access list, cave science and conservation need to be underpinning principles by which the Association and members manage. To ensure that this happens and we remain committed to environmental sustainable management of the caves, the National Committee intends to leverage the role of the Science Officer to ensure more member participation in mapping, conservation and scientific exploration.

Apart from a renewed focus on science and conservation, the National Committee has been looking for other focus

areas. In the last issue of Guidelines, you will have read a summary of the State Meetings. Since then, we provided to all, an opportunity to complete an on-line survey. The good part of this was that the majority of members who completed the survey did not attend the State Meetings. This means we have more people who have contributed to the view than ever before. While we are still reviewing the comments from the survey, what is clear is the general direction people want. The top priorities are education, site access, conservation and exploration. To do this well will mean more activities involving more members, working more with other organisations, changes to our regulations and standards, changes to our training and more people to lend a helping hand.

With the feedback from the State Meetings and on-line survey complete, one focus will be the development of the CDAA's Business Plan. This Plan will inform our priorities, budget and focus over the next few years. But this does not mean that we will do nothing until we have the business plan complete. We know the general direction so we can and will start the ball rolling.

Take care over the festive season.

May you dry suit remain wet on outside and dry inside.



The National Committee

John Vanderleest,
National Director



Helen Higgins,
Business Director



Linda Claridge,
Standards Director



Grant Pearce,
Site Director



Rowan Stevens,
Publications and Records Director

Symposium and AGM 2012

Text and Photos By Helen Higgins

This year's symposium and AGM were held on the 27th October. Over 60 members attended with lots of positive feedback received. The talks this year had an Aussie flavour showcasing some of the exciting exploration and research being undertaken by a number of notable Australian cave divers.

Paul Hosie spoke about some of the exciting discoveries on the Roe Plain, supported by maps, video footage and photos. He spoke about the caves' unique features and the importance of conservation measures. With this information and the collaboration between the CDAA and ASF-CDG, access arrangements are being secured which will enable CDAA members to access these amazing caves.

Craig Challen spoke about the latest exploration in the Pearse Resurgence which led to a 221m dive in 6.5C water and the challenges that such a dive placed on the team. Pippa Waterworth was very engaging as she provided an insight into the bacterial communities found in the caves of the Nullarbor Plain. Photos of these amazing and delicate formations highlighted

the importance of the fragility of these unique features and the importance of conservation management and controlled access to these sites.

John Dalla-Zuanna walked members through some of the programs and software that have enabled some amazing 3D mapping of caves and virtual cave diving and Richard Harris (Harry) discussed SAR, accident investigation and our developing role in this area.

The Main Corner was a fantastic facility with members enjoying the comfort of the Dress Circle lecture theatre for the symposium and AGM, morning and afternoon tea on the balcony and private rooms for meetings and vote counting.

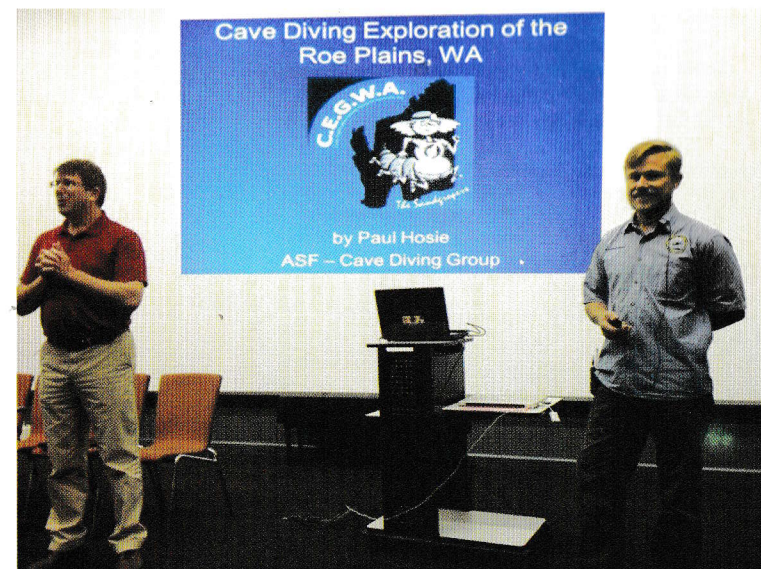
The day ended for most with a celebratory dinner at City Hall, beautifully catered by Sorrentos on the Main. It was a great way to end a very successful day, eating, drinking and enjoying the company of fellow cave divers and friends. For others the day ended in the wee hours, on the dance floor at Shadows.



Richard Harris



Craig Challen



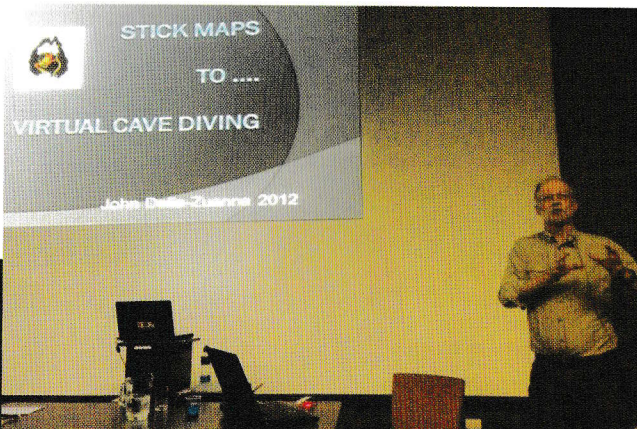
Top:
John Vanderleest and Paul Hosie

Middle: Pippa Waterworth

Below left: John Vanderleest

Below right: Paul Hosie

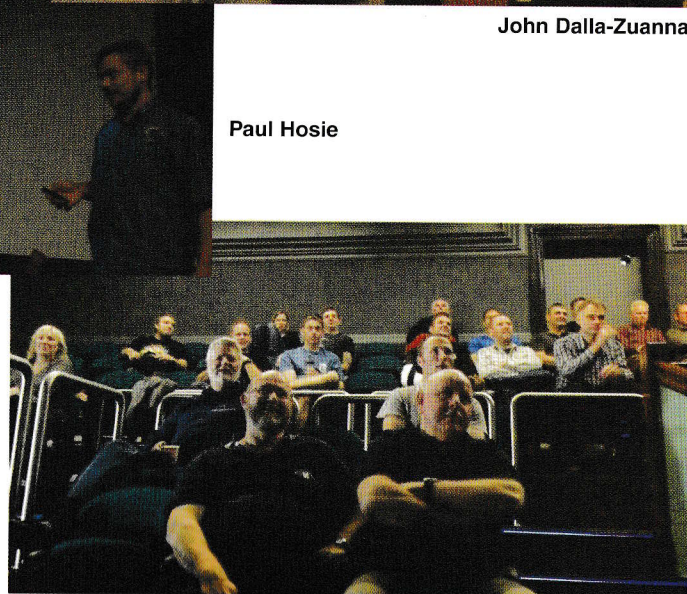




John Dalla-Zuanna



Paul Hosie



Members of the audience



Clockwise from top left:
Ian Taylor, Suzie Taylor,
Craig Larkin, Jennifer
Stockton, Jane Bowman,
Rick Nash, Peter Wolf,
Stephen Fordyce,
Joseph Monks, Jo Nally
and Leonard Dibb.



Graeme Roberts, Tim Muscat,
Adrian McDonald,
Bradley D'Ohnt, Philip Moore,
Andrea Gordon, Chris Browne,
Tim Payne; Faye Bulled, Bruce
Bulled, Darren Walters,
Suzanne Walters, Debbie Doveal

Below, Left to right:
Faye Bulled, Bruce Bulled,
Darren Walters, Suzanne Walters,
Debbie Doveal



Damien Saviero, David Bardi
and Deb Williams



Left to right:
Neville Skinner, Peter Streit,
Pippa Waterworth, Annette Hill



Left to right:
Claire Cooper, Steve Saville,
Chris Edwards, Paul Hosie,
Christie Allie, Gary Barclay,
Linda Claridge, Rowan
Stevens and Yee Stevens

Left to right:
Sandy Varin, John Dalla-Zuanna,
Richard Harris, Craig Challen
and Liz Rogers



NEW RELEASE: Ben's Vortex

Review by Barbara Anne am Ende

It was about two years ago that another death was posted on some of the internet cave diving fora. Apparently, a diver, not formally trained for caves, died at Vortex Springs in Florida (USA). There was just one problem: no body could be found.

Ben McDaniel had been working on mapping the smallish cave that feeds Vortex Springs. His vehicle had been sitting in the parking lot for nearly two days and some stage bottles were seen in the water. A large scale operation was instigated to recover his body. Some of the best cave divers in Florida (and arguably, the world) were a part of this effort, but no one could find the body. The cave just gets progressively smaller and tighter. Many of the cave divers who looked for the body, and many who read about the efforts on the internet, decided that he just wasn't there. Did he stage his own death to start life anew somewhere else? Did he succumb to foul play?

Meanwhile, his parents, still grieving from the death of another son, didn't believe that the divers who attempted to find Ben's body were courageous enough to go where their son had explored. They offered a \$10,000 USD reward (later increased to \$30,000) for a "fearless" diver to find evidence of Ben's remains. That did not sit well with the cave divers who worried it would entice another under-qualified diver to risk their life hunting for someone it was too late to save. Indeed, about a year later a modestly experienced cave diver who'd been following the McDaniel story did die in Vortex Springs.

The movie "Ben's Vortex" was written and produced by Robert McClellan. He's someone well placed to represent the various parties involved in this mystery. Robert is not a cave diver (and is highly claustrophobic), but he's married to Jill Heinerth — one of the top cave diving instructors and cinematographers in the world. His worry for Jill during every dive makes him sympathetic to the family. But his understanding of the world cave divers inhabit, means he understands our perspective, as well. Plus, he's had a wide range of life experiences himself providing insight to human nature.

The video footage was captured by Jill Heinerth and was as fabulous as one would expect. The show even has an original musical score by Xavier Fleuranceau.

Robert opened the movie by giving an introduction to Ben McDaniel by introducing himself and why he's interested in the story. We learn about Ben through fond recollections by his parents. Then several of the recovery divers are interviewed and they are as certain as they can be that Ben's body isn't in the cave.

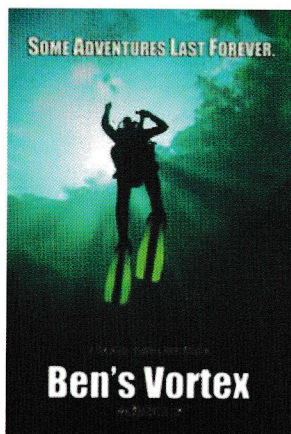
Robert dug deeper into who the "real" Ben was. It turns out he wasn't quite the choir boy that his parents described him as. He lost his construction business, got divorced, suffered from (and was on prescription medications for) depression, took illegal drugs, owed the Internal Revenue Service money, and had his house foreclosed on. Robert noted that Ben is the kind of guy who doesn't play by the rules. What does that mentality mean with regard to cave diving?

Much of the rest of the movie explores the various explanations for what happened. Did Ben die in the cave where no one could find him (by accident or as an intentional suicide)? Did he die and his body removed (to avoid bad press for the commercial spring operation)? Was he killed by rough characters whom he encountered during his troubled life (and his truck left at the spring as deception)? Did he stage his death and really sneak off to start a new life? Did the owner of Vortex Springs (or an employee who unlocked the cave gate for Ben) have anything to do with the disappearance? Why was Ben's disappearance not reported for nearly 2 days after the fateful dive?

A fun segment near the end of the show was a spirited discussion between Robert and Jill. "He's in the cave." "He's not in the cave. You proved it to me yourself!" And that is the way the movie leaves you at the end. What happened? You'll probably find yourself debating with others who know the story regarding what you think really happened.

If there's any downside to the show, I think it might have been drawn out just a little too long. It seemed like the story was extended a little to reach a 1-1/2 hour duration. But even still, the show was well made, informative, and entertaining.

So what do you think happened to Ben McDaniel?



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Karst Geology

By Ian Lewis #258

Weebubbie Cave, Nullarbor Plains – A magnificent lake under the desert!

Weebubbie Cave is truly the “Wonder Down Under” of the Nullarbor Plains. No - it's a lot more than that... there is nothing like it under the Australian continent! It is the world's third largest underground lake, after Dragon's Breath in South Africa and Cocklebidy (which is a bit bigger but muddy). In Mount Gambier we have two large underground lakes in McKay's Shaft and Young's Cave but they do not reach the magnificence of Weebubbie Lake. It is the most beautiful of all underground lakes and conceals fascinating insights into the formation of the giant caves of the Nullarbor. This article traces the history of Weebubbie Cave exploration, beauty and science as it is now becoming apparent that this cave holds many of the keys to understanding the phenomenon of what is hidden under one of the world's largest karstfields and treeless plains.

Early discoveries and Weebubbie's name

Most of what is known about the Nullarbor caves has been discovered since 1955 when organised speleology began explorations here. Before that, rumours and occasional magazine articles with some black-and-white photos gave hints about what lay under the desert. I still have my geography textbook from year 5 at school in which states that “huge lakes and rivers wind their way around through endless vast caverns and mazes under the Nullarbor treeless plain”. That's what we were taught in the very early 1960's. I remember being fired up by that description even as a kid but never dreamed that years later I would be involved in discovering and mapping those mysterious great tunnels!

Weebubbie Cave is unique in several ways. It appears to be the first large cave on the Nullarbor to become known to European settlers. It is the deepest cave on the Nullarbor by at least 30 metres. It runs at right angles in a direction opposite to that of many large caves. Both these facts make it extremely geologically significant. It is also a very important bat colony and breeding site. And it has an amazing histo-



Before the invention of cave diving ladders. Note hand winch and rope on the axle

ry of human adaptation and endeavour since settlement. History records that two telegraph operators from the Euda Telegraph Station were shown the cave by an aboriginal guide while kangaroo hunting on the Plain in 1900. There are differing stories about the origin of the name. One version says it came from two words – Wepa kapi – meaning “ants going down to water”. Another version is Weebabbj-Junnaabil, apparently translated as “slipper feet”, or Weebabbie Karoo which may have been a reference to a place of storage for sacred items. Weebubbie seems to be a European-ised version of these earlier names.

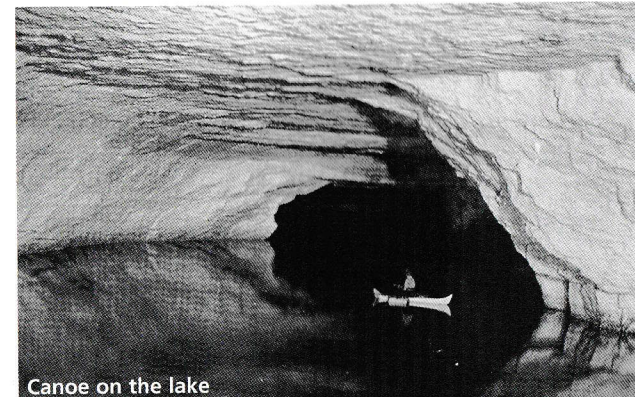
A year after its discovery, which would have been utterly amazing news to settlers battling to survive in the dry

Nullarbor Plain, the WA Government assessed it and later made it a Water Reserve in 1924, leased for grazing water supplies. There are some epic stories about trying to get the water to the surface of the plain and evidence of some of these can still be found in the sinkhole and surrounding area – old iron pulleys, remains of old iron ladders, the drill collar of the bore which was sunk directly into the lake, borepipe remains in the lake etc. When I first visited Weebubbie in 1969, there was a huge diesel engine by the side of the small lake and piping all through the cave to the surface, placed there at enormous effort by the Gurney brothers who grazed the Euda and Koonalda areas. When the diesel started up, the cave was really noisy and smelly and built up with fumes. Horrible! Later the engine was removed, probably when the Euda Motel went over to de-sal.

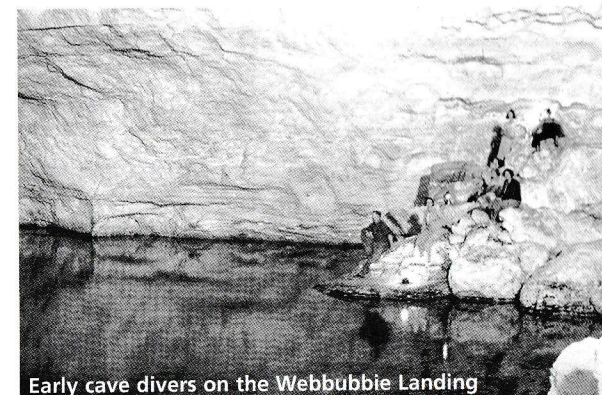
Cave exploring began about this time and the locals used whatever they could to access them. The easiest way was to use a hand-powered winch on the back of a truck and lower people over Weebubbie's edge! (see photo). Two turns of a rope around the winch and no Workplace Safety supervisors – but nobody died falling off, either! These would have been days of great adventure.

1930's-1950's Captain Thomson's Expeditions

After a life at sea commanding windjammers around Cape Horn, Captain J. Maitland Thomson became Harbourmaster at the Port of Thevenard at Ceduna on the South Australian side of the Nullarbor Plain in the early 1930's. He was very familiar with the marine navigation maps of the region including the Nullarbor Cliffs along the Great Australian Bight, which had been mapped and sounded so well by Matthew Flinders in 1802 that no-one has needed to improve them since! Inland of the cliffs, the Nullarbor marine charts showed absolutely nothing except



Canoe on the lake



Early cave divers on the Weebubbie Landing

for some inexplicable reason one single dot on the inland part marked as “The Catacombs”! This appears to have come from a very early land exploration in the late 1800's.

Thomson was fascinated with this and spent the next 30 years running 12 expeditions (1932-1962) to find Nullarbor caves. He was very energetic and innovative, using biplanes to search for entrances and signalling to ground parties, inventing a magnesium flame blaster for photographing the huge cave halls and lowering a boat and a canoe into Weebubbie Cave to explore the darkness of the lake (see photos). He ran his expeditions like he commanded the Tall Ships that he used to sail around the world as a young man! In his final years I formed a friendship with him and in the 1970's took his giant magnesium blaster back out to the Nullarbor for spectacular cave photography. He then gave me copies of hundreds of slides and black-and-white photos of all his expeditions plus his early maps which I placed into the records of the Cave Exploration Group of South Australia (CEGSA).

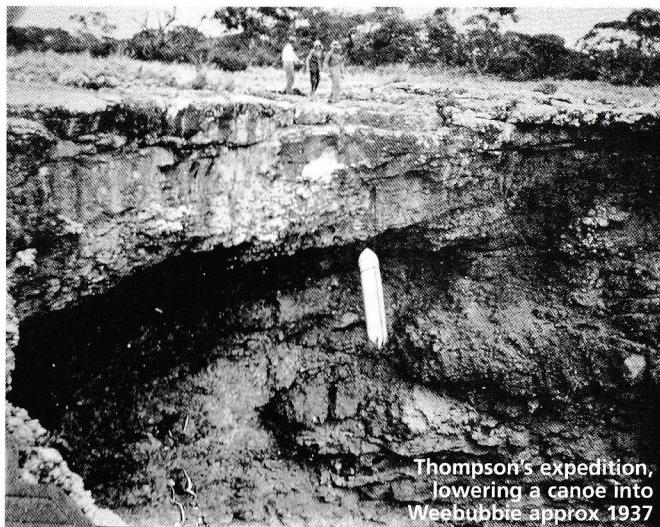
Modern Speleology, cavers, aerial photography and systematic cave documentation

In 1955, CEGSA was formed from a group of Adelaide Uni scientists and students, Captain Thomson and some of his experienced mates and researchers from the South Australian Museum. Almost immediately Captain Thomson left CEGSA in a huff because of the decision to include women in the Group! Obviously that was not how you ran a ship of the line! This was contradictory because he took his daughters out there on several of his expeditions! He boycotted CEGSA for 20 years until I made contact with him to explain our cave diving discoveries in Weebubbie in 1972. He finally unbent and was delighted to know what we were finding, and

said wistfully to me one day in his 80's that if SCUBA had been invented and available in his days, he would have had a red hot go. I am sure he would have. But I am always glad that I could make contact with him and repair all those years of standoff satisfactorily before he died. Our reward was that his records are now available to us all.

CEGSA organised the first Nullarbor Scientific Cave expedition in 1955-56. This was followed by 15 years of Nullarbor expeditions in combination with major caving clubs and speleological societies all over Australia. Professor Joe Jennings, the father of Karst Science in Australia at the brand new Australian National University in Canberra and Dave Lowry, Western Australian Petroleum's Principal Geologist, scoured all the new Nullarbor aerial photos available after World War 2 looking for Nullarbor Cave entrances. This led to a whole rash of major caving expeditions discovering Mullamullang Cave, Pannikin Plains, Tommy Grahams, Firestick Cave, Capstan Cave and the two Kestrels etc and maps of many of the major systems down to the water line plus a series of important scientific reports and papers published nationally and internationally.

In 1966 a week-long underground camp expedition in Mullamullang Cave mapped more than 6 kms of vast dry passages. In 1969, I first visited the Nullarbor on one of these large CEGSA expeditions and being only 16 and keen, I zoomed ahead of the party in Weebubbie and walked straight into the lake up to my chest before I spot-



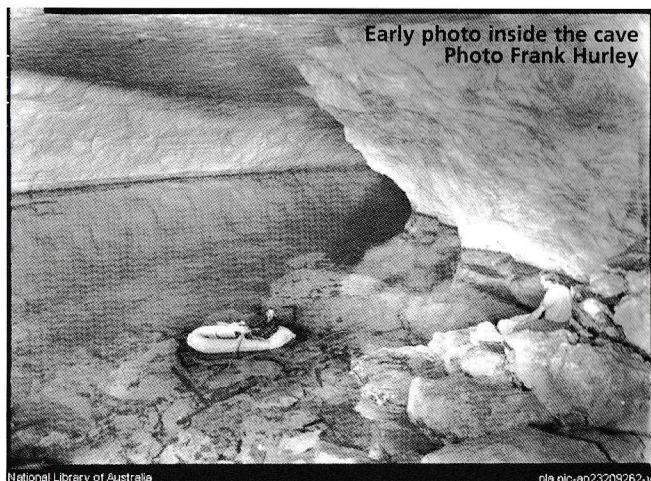
Thompson's expedition, lowering a canoe into Weebubbie approx 1937

ted it! On that trip I swam the length of the lake (no wet-suit!) with a Pinnocchio mask and snorkel and looked down into that enormous sump at the end. Then I swam back and I announced to everybody, "I'm taking up SUCBA to come back and explore this!" It was a life-changing moment for me and for the exploration of the Nullarbor, opening up this fantastic area for a whole generation of Cave Divers.

First Diving... AT WEEBUBBIE WHERE IT ALL STARTED

I learned to dive from Phil Prust, Dave Warnes and Bob Turnbull (who probably still regret it!). My first qualifying dives were in Mount Gambier sinkholes! (Ah, they were the days before regulated training. In fact, they were also the days before the CDAA was even dreamed of.) I told Phil, Dave and Bob about Weebubbie and together we put together the first Nullarbor Cave Diving Expedition in Jan 1972. I organised the expedition arrangements and 30 cavers from all over the country, Phil and Dave and Bob Turnbull planned the diving and Ron Doughton arranged to bring the vital compressor from Sydney. Ron has written an excellent article about this expedition featuring all our very basic gear. (see Guidelines issue 105).

We discovered the enormous sump, the Inner Dome Lake and the Railway Tunnel, all on single tanks, single regs, little Aquafash torches and 6-volt US Diver sealed beam lights. It was an



Early photo inside the cave Photo Frank Hurley

National Library of Australia

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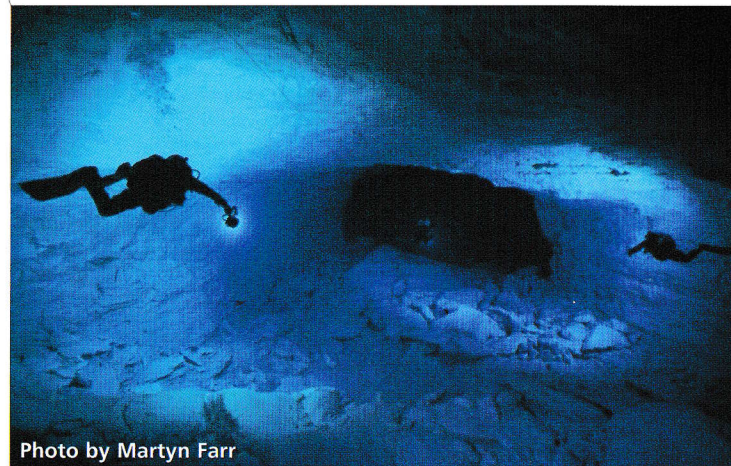


Photo by Martyn Farr

unforgettable experience. We noticed for the first time all the bacteria colonies and other growth forms throughout the lake and tunnels and took samples back to Adelaide University. In the midst of all this, Steve Patupis, the owner of the Eucla Motel, dreamed up a publicity stunt about a "Nullarbor Nymph" – a blonde woman in a 'roo skin seen in various Nullarbor locations running through the bush leading a mob of kangaroos! The press arrived from everywhere and wanted to photograph Denyse from our expedition in a cowskin but we didn't want anything to do with it as were concentrating on cave diving.

On our recent trip out there I was reminded of a serious incident on that trip. The Inner Dome Lake is perfectly oval-shaped and the huge tunnels on either end look identical. Several of us had been in the Inner Dome on single tanks and headed back into the sump toward the Main Weebubbie Lake. However, halfway through we realised we were heading AWAY from the Main Lake into the other terminal sump. We backtracked to the Inner Dome extremely worried and realised we had to get back out to the Main Lake on about 70 bar. That huge sump is a hell of a long swim when you're trying to keep calm and with tiny lights but we just made it. On the next dive I wrote "WAY OUT" in the soft rock at water level in the Inner Dome so that no-one could run that risk

again. Of course, it is fixed-lined now but the words are still clearly there just above water level and it was eerie last week to be back there exactly 40 years later and recalling how close it was. You can still read the words just above water level at the north-eastern end – check it out on your next trip through. They are now part of Nullarbor Cave Diving history but will only ever be seen by cave divers' eyes.

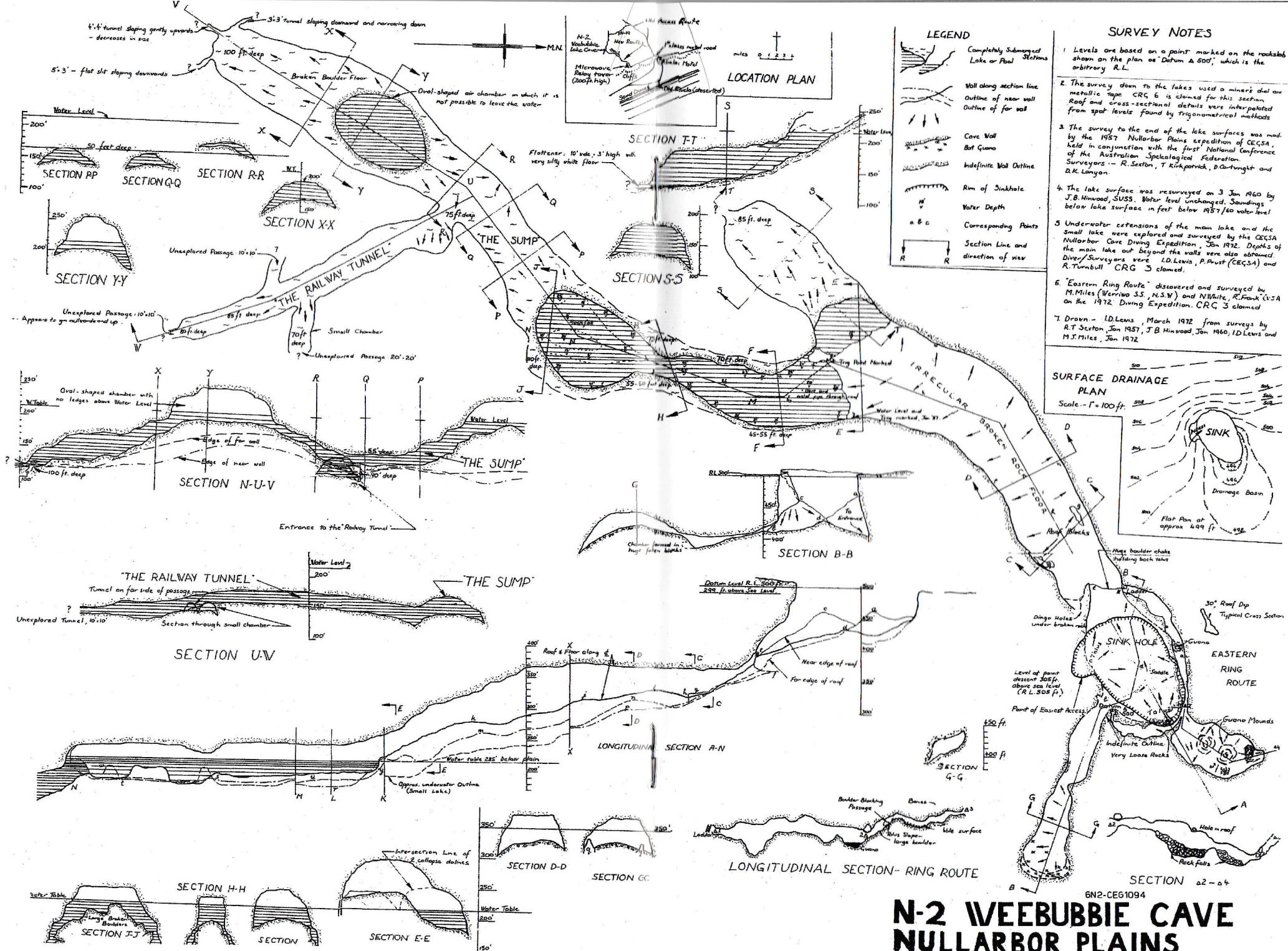
It's worth recording here that I finally tracked down a very old

report that a single diver had been in Weebubbie 10 years before us in 1962. David L Cook, a palaeontologist from the Western Australian Speleological Group (WASG) had dived alone "on an Aqualung to a depth of 30 feet and 200 feet in" while his buddy paid out a safety line from the end of the Main Lake, just far enough to see that the tunnel sloped upwards into a new chamber way beyond his reach. (On the same trip he also got 80 feet into the muddy sump of Cocklebidy and turned around thinking that the wall came down to the floor in the gloom. So he was first there too, but had no idea it goes for 7000 metres!) This was seriously brave diving and credit must be given to him for being the first cave diver on the Nullarbor. As far as I can find out, he never returned nor cave dived anywhere else

continued page 20

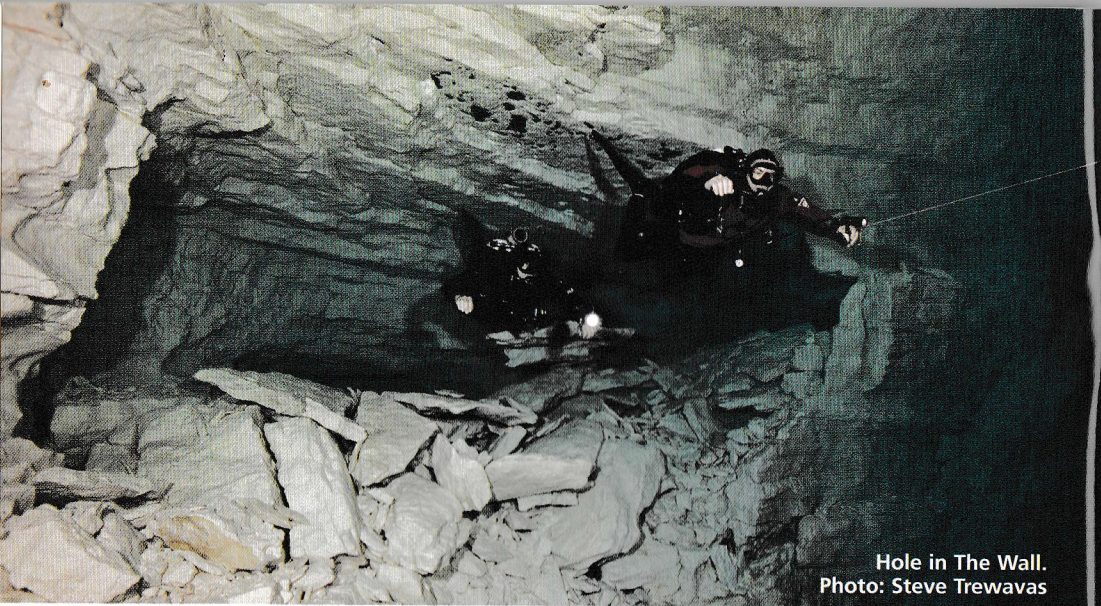


Diver entering the deep section at the end/left of the Railway Tunnel. This has developed at a lower level than the "Hole in the Wall" back closer to the Main Lake. Photo: Ken Smith



N-2 WEEBUBBE CAVE NULLARBOR PLAINS

SCALE 1" = 50 feet



Hole in The Wall.
Photo: Steve Trewavas

afterwards. It was open to us to do all the discoveries in 1972. In recent times, Ken Smith took Forrest Wilson to Weebubbie (see photo). This must be the first time ever that the Nullarbor had a "Forrest" on it. Sorry, bad joke, folks! See Forrests' article in Guidelines #118.

About the huge MAP and CEGSA – the recording authority.

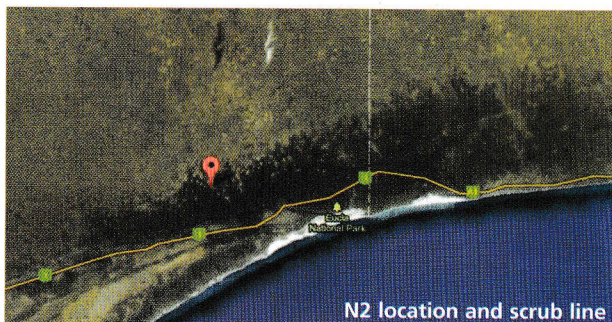
The centre-page feature in this issue is the epic map which I drafted up by hand (pen and ink!) on our return from that expedition. It was more than 1 metre square on the drafting board. That's how caving societies recorded maps 40 years ago. CEGSA through its affiliation with the SA Museum and by arrangement with WASG in WA is the central recording and numbering authority for all Nullarbor Plains Cave maps and records. Weebubbie is one of the earliest caves numbered and is numbered "N2". At the time of our 1972 expedition there were approximately 300 caves, dolines and blowholes listed on the Nullarbor. Today there are more than 5,000 with another 7,000 spotted but yet to be investigated! We have barely started to record the

immensity of the karst features across the Plain in both States. My estimate is 100-200,000 karst features to be found and recorded!

The map is reproduced with CEGSA's permission. Although I did the survey and drafted it, I presented it to CEGSA for their official records, so it is copyright, but we all agreed that it is a great opportunity to show it to the cave diving community after so many years for your interest. The map is in feet (Imperial system before Australia went Metric). It took a lot of effort for the divers to drag 300-foot (100m) tapes through the Sump, Inner Dome and Railway Tunnel and to map all the cross-sections in detail. You can see that we didn't even get into the Short Cut and the Hole-in-the-Wall at the time.

The survey notes make interesting reading and the little inset map shows the drainage lines leading up to the entrance. If Weebubbie ever cops a cyclonic cloudburst like Pannikin Plain (or like Cocklebidy did one year when one of our expeditions were camped there), a torrent of water will flow from the flat blowhole plains into the sinkhole

entrance and disappear into the huge boulders. But it won't filter into the Main Lake as there is no evidence whatsoever of silt or clay runoff from the surface ever reaching that lake, and our brilliant world-class visibility will never be ruined! It is now thought that short sharp big flood events are the agents for continued large-volume development as the fresh water runoff mixes with the brackish groundwater to boost the dissolving power of the water at lake levels, going to work rapidly on the very soluble white limestone. This



N2 location and scrub line

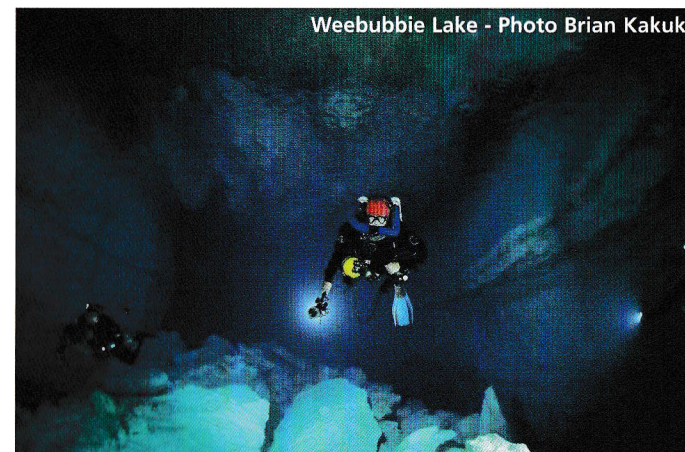
might seem to be rare events, but when you multiply such storm events (eg once or twice a year somewhere on the Nullarbor Plain) over several million years, that's a hell of a lot of forced dissolving occurring underground.

About the new photos, new science and ABC's Catalyst programme.

In late November 2012, the ABC's scientific research documentary programme "Catalyst" contacted the CDAA about doing a special on the Nullarbor Caves. They had heard about Pete Buzzacott's recent observations, recordings and logging of increased temperatures in Murra-El-Evelyn Cave which he'd published in several reports in "Australian Caver". My PhD karst research in the Mount Gambier sinkholes and in the larger dry caves at Naracoorte has been focusing on why some caves are so large and how they are not filled to the brim with natural rock collapses as a result. This has led to insights about massive rates of dissolution of limestone under non-normal circumstances, including acidifying effects on the groundwater associated with volcanic activity around Mount Gambier.

Pete and I have been working on understanding the "warmer zone" of cave waters reported by many divers over the years around Tommy's, Murra, Pannikin and Inner Cocklebidy. We are very interested to see what kind of geological and hydrological links there might be as the Nullarbor limestones are very similar and were laid down by the same ancient seas at the same general time as the Mount Gambier limestones and both have giant caves and sinkholes. Even Martyn Farr on his website recognises that Weebubbie Main Sump and the Railway tunnel are the largest underwater tunnels in the world. Woo Hooo Weebubbie!!

So Catalyst have just filmed Peter and myself out at Weebubbie examining it closely for further evidence, because it's so big and the deepest cave. They contracted Liz Rogers who is fast becoming one of the world's best cave diving photographers and Stefan Eberhard joined us as specialist in Nullarbor Cave invertebrates another micro-creatures (called Stygofauna). It's great that Stef was involved as there is great current interest in an unexpected developing link between biology, geology and hydrology in the long time frame of Nullarbor Cave formations. Catalyst have scheduled their Documentary on Weebubbie Cave for February 21st, 2013 (before the next Guidelines is out) so we are letting people know now. Liz has provided a selec-



Weebubbie Lake - Photo Brian Kakuk

tion of her brilliant photos for in this article as an indication of the underwater footage you will see in the program.

All of us would like to thank the CDAA committee and particularly John Vanderleest for directing Catalyst towards our scientific and filming work. This shows the quality of environmental expertise and knowledge of caves and groundwater which cave divers can bring to the eyes of the world of science, particularly as groundwater is an increasingly precious resource in an apparently drying planet. A feature article will appear in the next issue of Guidelines on the Catalyst expedition and the new science which is being revealed about the Nullarbor Caves.

As a direct result of this trip, several future expeditions are being planned for Weebubbie Cave to measure and map in great detail the geological features and micro-temperatures within the deep water columns. The real stars of the show are the huge floodlights which reveal so much more about the cave which we can't spot with isolated torches and are providing great new information, and Liz's fabulous underwater photography which brings the hidden splendour of Weebubbie Cave to the world. Now the school geography textbooks will have to be changed and completely updated!

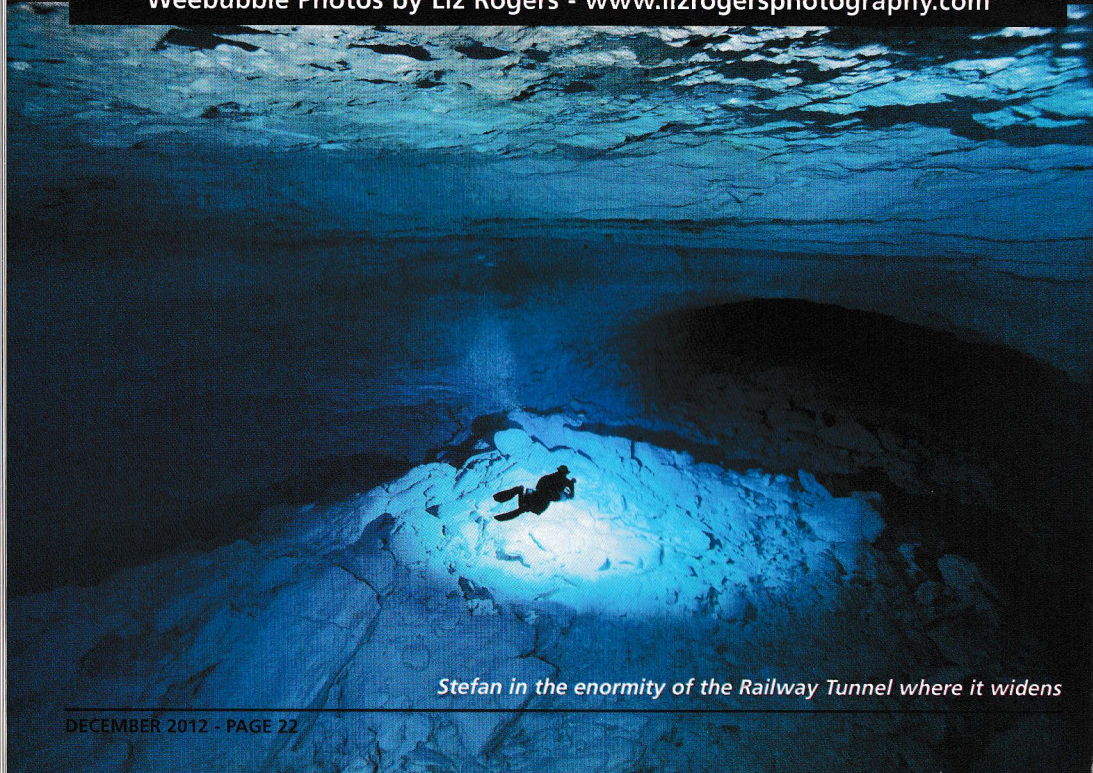
And whenever I think of Weebubbie Cave, I also think of the first explorer Edward John Eyre who nearly died staggering across the Nullarbor in 1840, never dreaming that only a few miles inland from where he was passing lies one of the greatest underwater spectacles imaginable – huge, clear, cool, refreshing, beautiful Weebubbie Lake Cave. What an absolute privilege to be able to dive there.

Turn the page for some of Liz Rogers' spectacular images she photographed during the film shoot with ABC's Catalyst Program. There will be more images in Ian's overview in our March 2013 issue of Guidelines.



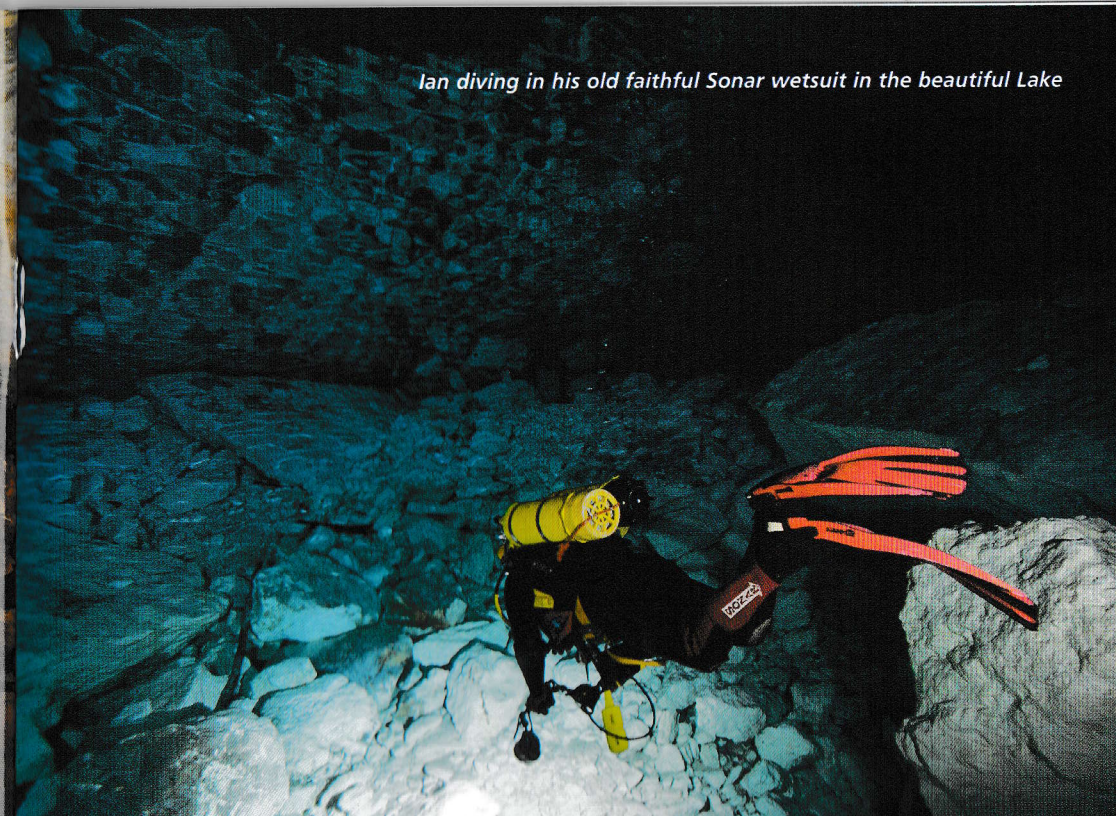
Stefan at start of the Main Lake

Weebubbie Photos by Liz Rogers - www.lizrogersphotography.com



Stefan in the enormity of the Railway Tunnel where it widens

Ian diving in his old faithful Sonar wetsuit in the beautiful Lake



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James Cameron tackles the Mariana Trench

By Timothy McDonald

Whatever you think of film director James Cameron, he seldom does things by halves. Not only is Cameron responsible for some of the biggest films of all time, he is also an avid explorer.

After making the big-selling weepie *Titanic*, he used Russian-built deep-submersibles to go to the bottom of the Atlantic and make a documentary about the wreckage.

Now the man who brought the world *Terminator*, *Aliens* and *Avatar* has gone even deeper still: to the bottom of the Mariana Trench.

Cameron took his specialised submarine, which, due to its design, looks quite different to others.

The *Deepsea Challenger* is vertically, rather than horizontally oriented, with a steel sphere at one end that keeps the pilot safe from the crushing pressure of the deep.

The submarine was built by a company called the Acheron Project in a warehouse in Leichhardt, in inner Sydney.

Australian sub heads for Mariana trench (PM) Managing director Ron Allum spoke to PM as he sat above *Challenger Deep*, the deepest known point of the world's oceans.

Mr Allum said "the divers will spend the majority of their time in vertical ascent and descent".

"When you look at the profile of the dive we spend the majority of the time in vertical ascent and descent and very little time in horizontal flight," he said.

"If he can quicken up the descent and then the ascent (it will maximise our time) on the bottom.

"We do have good forward movement in any case. We have six horizontal thrusters that are proving to be quite powerful."



Adventurer and film director James Cameron (Bradley Kanaris: Getty Images).

Mr Allum was on board the submarine with Cameron and a team of scientists, including experts in plate tectonics and biologists.

"We've got science well and truly covered," he said.

"My role in the expedition was purely to build the expedition vehicle, overcome all the hurdles associated with that, and I leave the science to other people.

"I just hope I've made a vehicle that is a utility for scientists."

Under pressure

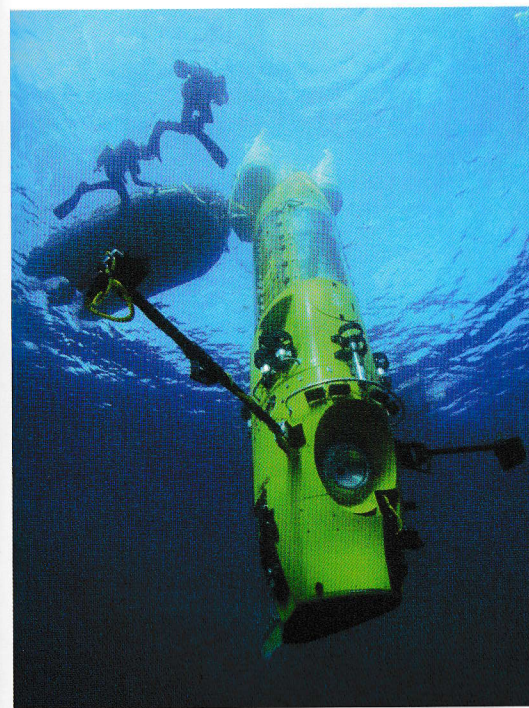
Mr Allum said he was confident the submarine will be able to withstand the intense pressure at the ocean's floor.

"We've done a lot of engineering on the way and a lot of our products have been tested," he said.

"If you look at every little piece of the submersible, we're sure every piece has been pressure tested in a chamber.

"We glued the whole assembly together. We don't have a pressure chamber big enough to test it; we're literally going to put it in the ocean."

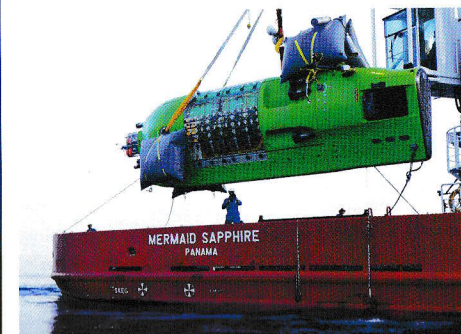
Mr Allum says he was chosen to build the sub in Sydney because of his prior work with Cameron.



"I've been on quite a few expeditions with Jim Cameron where we field *Ghosts of the Abyss*, *Aliens of the Deep*, we did a *Discovery* special on the *Bismarck* and also we did a live telecast from the *Titanic* in 2005," he said.

"I've had a bit of experience working with James Cameron. I guess one thing led to another, we get talking on boats, especially when they're en route to location, and this came up some years ago.

"My job was a broadcast tech basically - my job was to make things happen - and basically what I've done is made a camera, some amazing cameras, to go down to the bottom of the ocean."



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Do's & Dont's - Defining Medical Fitness to Dive

By Jake Freiburger, M.D., DAN America Assistant Medical Director.

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If a diver has a medical condition that might affect his or her ability to dive safely, he/she must have a clear understanding of the specific limitations.

Regulatory authorities can vary from region to region globally. For example, both commercial and recreational diving in the United Kingdom and Australia require specific medical clearance examinations. However, neither is officially regulated in the United States by an overseeing authority and the same is true in many other countries, especially developing countries, around the world.

Because of this lack of regulation in most places, the burden of responsibility for dive fitness rests with the diver. When divers consult physicians about their diving fitness, the evaluating physician should consider fitness requirements in the context of the dives each particular diver is planning.

A technical dive, for example, would be riskier and more challenging, both mentally and physically. It would also demand a different standard of physical as well as intellectual fitness. The spectrum of dive certifications, from novice to technical levels, as well as each individual's current health exemplify how fitness requirements should be tailored to the type of diving planned.

Any fitness-to-dive evaluation should have both an educational and evaluative function. The encounter should serve to inform and assist prospective candidates to become aware of potential health-related dive safety issues.

If a dive candidate has a medical condition that might affect his ability to successfully put into practice what he has learned during training, then he must understand his specific limitations in greater detail. This is important for divers with chronic diseases such as asthma, diabetes or cardiac conditions because they need to self-monitor to make an appropriate "go" or "no-go" decision for each dive.

Conditions like these can limit exertion and place divers at an increased risk of drowning. Cardiopulmonary disorders lead this category. This article discusses cardiovascular and pulmonary disease and additional medical issues that might be problematic in an evaluation of one's fitness to dive.

As with all chronic diseases, dive physicians should assess to what degree heart or lung disease affects individuals' daily lives as well as their maturity and understanding of their particular condition. Physicians should then offer insight into the specific diseases of their patients, explaining the possible consequences of a diving accident.

Cardiovascular disease

Many medical problems experienced during a dive are less related to the specific demands of the dive setting than to a diver's pre-existing medical condition. Cardiac problems illustrate the point.

We see cardiac complications in many diving deaths reported to DAN. Why is this happening? It is no doubt related to the fact that the average age of the diving population is now 43 years. Many divers continue to dive into their 70s and 80s, thereby establishing a slightly higher-than-normal risk of cardiovascular disease than that experienced in the general population.

Exertion requirements

Although routine recreational dives are not particularly strenuous, exercise requirements vary depending on the dive site, currents and expected sea conditions. Diving in rough seas or a current imposes a necessary exercise demand on the cardiovascular system. The energy required to swim against a current increases significantly. If the current speed doubles, the energy required to swim against it increases 4 times. A 1.8-knot current approaches the maximum speed even fit swimmers can swim against.

Physiologists often measure an individual's maximal oxygen consumption, or aerobic capacity - abbreviated as VO₂ max - to describe peak exercise capacity. VO₂ max is defined as the maximum amount of oxygen in millilitres one can use in one minute per kilogram of body weight. Additionally, VO₂ max correlates with peak exertion, not

endurance. According to diving cardiologist Dr. Fred Bove, a diver with a maximum oxygen consumption of 40 ml/kg/minute can tolerate swimming against a 1.3-knot current for only a few minutes.

At high workloads, such as those approaching 65 percent of a person's VO₂ max, an individual experiences fatigue accompanied by severe shortness of breath. This finding, Bove says, explains why currents greater than 0.8 knots are associated with an increased risk of panic and drowning, further illustrating the wisdom of matching the requirements of your dive to your personal fitness level. This is particularly important for individuals with limited exercise capacity and those who have cardiovascular disease.

Can you dive after a heart attack?

The answer is not a simple yes or no. Most dive physicians agree that many individuals can resume diving after a heart attack if they keep the demands of their exertion within reason. Although there are no accepted U.S. recommendations,

most diving physicians recommend an 'exercise stress test'. Exercise stress testing will help determine whether an imbalance exists between the supply of oxygen to the heart and the demands of the anticipated workloads.

METs, also known as metabolic equivalents, are defined as the ratio of a person's working metabolic rate relative to the resting metabolic rate. Measuring METs is another way of expressing exercise workload; 1 MET corresponds to an adult's assumed resting metabolic rate of about 3.5 ml of oxygen per minute per kilogram of body weight.

Bove states that most diving in warm water requires activity in the range of 3 to 5 METs with occasional excursions to 7 METs. He recommends that divers who plan to conduct "difficult dives" be able to tolerate a level of 40 ml/kg/minute, or about 13 METs as the lower limit for divers. Treadmill testing can easily provide that information. "Less difficult dives," or dives with fewer physical demands, are evaluated accordingly.

Diving after cardiac surgical procedures

But what about divers who have undergone heart surgery or those who have had angioplasty or another type of revascularization or blood vessel repair surgery? Can they dive?

Recommendations vary globally. Although there are no universally accepted rules in the United States for returning to diving after heart surgery, rules in the United Kingdom stipulate that if a bypass grafting or angioplasty is required, a previously trained diver may return to diving, but training of a new diver should not begin. DAN advises any beginning diver with any degree of heart disease to consult a cardiologist before beginning dive training. (Ed's note: It is preferable that the cardiologist has knowledge of diving and an understanding of the stressors of the diving environment.) If the diver, personal physician or specialist needs additional information, the DAN office can be contacted during office hours: 9886 9166. (Such a call should not be made to the emergency hotline).

Patent foramen ovale

It has been known for some time that in retrospect, case control studies indicate that a patent foramen ovale, an interatrial defect in the heart, is associated with decompression illness (DCI), particularly the neurological variety.

Case control studies do not imply a direct cause and effect, however, and although the increase in relative risk is technically statistically significant, the increase in absolute risk is likely trivial. In other words, a twofold increase in a small risk is not as meaningful as a twofold increase in a larger risk. The U.S. Navy, NASA and commercial diving companies do not routinely test their divers or astronauts for PFO: What to do about divers with PFOs remains a controversial topic nonetheless.

Rules in the United Kingdom suggest that right-to-left shunts, such as PFO, be tested to determine whether an unexpected neurological bend has occurred. If a PFO is discovered, dive

physicians usually recommend the diver maintain depth limits of 15 metres and consider surgery to close the opening. There may be good reasons to surgically correct a PFO in non-diving individuals, but there is controversy about the advisability of surgically closing PFOs to prevent DCI in divers. This author opposes the practice for the following reasons:

1. The risk of contracting DCI, even in divers with PFO, is much smaller than the risk of surgical complications.
2. While the severity of almost all DCI in recreational divers is extremely mild, surgical complications associated with operating on the heart can be severe.
3. There is no convincing evidence that closing a PFO will prevent DCI. Many people without PFOs still experience decompression illness.
4. The service half-life and the long-term durability of the patch material used to close the PFO are unknown.

In a young person, it will need to last many years without breaking down; the track record is not yet established. This is a question that will require additional careful study.

Pacemakers and other cardiac equipment

If they are used within the manufacturer's operating depths, pacemakers may be acceptable for diving. There are depth limits to observe, however.

A team of doctors recently reported on testing of cardiac pacemakers, carried out independently of the manufacturers, to depths of up to 60 metres. None of the devices failed electrically at the tested depths, but more than half of the containers were deformed at the 60-metre mark. No containers were deformed at depths of 30 metres; this falls in line with most recommended depths for these devices.

Diving with an automated implantable defibrillator is not recommended. These devices are used on individuals whose underlying condition put them at risk for recurrent, sustained ventricular tachycardia or fibrillation, both possible life-threatening conditions. Such conditions can cause loss of consciousness, never a safe prospect in diving.

Although prosthetic heart valves are not in themselves a contraindication for diving, the chronic anticoagulation (blood thinners) required for mechanical valves rules them out. A diver who has been prescribed an anticoagulant, e.g., Coumadin or warfarin, should be warned of the potential for bleeding: Excessive bleeding can occur from even a seemingly benign ear or sinus barotrauma.

In addition, there is a potential risk that, if decompression illness occurs, it may then cause significant bleeding in the brain or spinal cord. Finally, if bleeding occurs for any reason, the diver being treated with anticoagulants might experience greater than normal blood loss and simple, yet lifesaving, treatment may not be available because bloodbanking facilities are usually not found in remote dive locations.

A more relevant consideration, however, is the underlying condition necessitating any cardiac device: Is it a contraindication

ation in itself? This is a question best answered by a medical professional on hand.

Pulmonary Disease

Pulmonary conditions such as asthma and chronic obstructive lung disease have a twofold risk: They can limit exertion, and they present a risk of barotrauma. However, respiratory limitations on exercise capacity may be more important than gas-trapping considerations. Here again, however, we see some global differences in recommendation.

Asthma

For example, practitioners in the United Kingdom, United States and Australia approach asthma very differently. The U.K. recommendations are more liberal: They allow diving by individuals treated for asthma as long as they are asymptomatic.

By contrast, Australia recommends a more extensive workup with pulmonary function tests, including a saline or methacholine challenge, medical tests used to assist in the diagnosis of asthma.*

The U.S. recommendations vary within these test limits. At Duke University, we recommend that one meets the following criteria:

1. No current symptoms attributable to asthma;
2. A normal physical exam without active wheezing;
3. Normal spirometry before and after provocative exercise testing.

Because asthma is a heterogeneous disease - that is, it has a great variety of dissimilar constituent triggers - the decision about whether to dive must be made on a case-by-case basis.

The many faces of pneumothorax

Pneumothorax, or collapsed lung, appears in several forms. A simple pneumothorax usually occurs with only partial collapse of a lung; the pressure buildup in the lung cavity is not sufficient for cardiovascular complications. Individuals with a simple pneumothorax may not have noticeable signs and symptoms.

If a diver experiences a spontaneous pneumothorax, on the other hand, this is considered a medical emergency and a contraindication to scuba diving. A recent study showed that individuals with a previous spontaneous pneumothorax had a 19 percent chance of recurring within one year. Spontaneous pneumothorax can occur without any trauma to the chest. Or it can be caused when a bleb, an imperfection in the lining of the lung, bursts and causes the lung to deflate. Other causes for this condition include these diseases:

- chronic obstructive pulmonary disorder
- tuberculosis
- pneumonia
- asthma
- cystic fibrosis
- lung cancer
- interstitial lung disease
- Marfan syndrome
- lymphangioleiomyomatosis

Blebs (or bullae) are abnormal balloon or blister-like exten-

sions of air sacs in the lungs. They are responsible for the most common lung condition that predisposes an individual to pulmonary barotrauma. Scientists believe these sacs are caused by degradation of elastic fibers in the lung due to inflammation.

Blebs are most frequently found in smokers, but they can also occur in non-smokers. Because these sacs are thin-walled and during exhalation tend to empty their air slowly, pressure can build up during ascent, and they may rupture. Dive physicians recommend specific testing for divers who have experienced pulmonary barotrauma before they return to scuba diving. The evaluation may include a set of breathing tests, a chest X-ray or computed tomography of the chest (CT or "CAT" scan).

A significant step beyond simple pneumothorax, tension pneumothorax is a life-threatening condition that prevents adequate exhalation to push the air back out into the pleural cavity. This condition can result in an accumulation of air that puts pressure on the mediastinum, compressing the heart and decreasing cardiac output. In addition, it can put enough pressure against the trachea to deviate it from the midline. The increased thoracic pressure can decrease venous return to the heart, causing a backup of blood into the venous system.

The grave possibility of developing a tension pneumothorax at depth prevents most dive physicians from recommending certification for individuals who have had a pulmonary barotrauma unless they have had medical or surgical treatment to reduce the probability of a recurrence.

Traumatic (iatrogenic) pneumothorax, a type of pneumothorax caused during the routine course of a surgical procedure, are not thought to have the same risk of recurrence as the spontaneous variety.

Restrictive lung disease, which results in decreased pulmonary elasticity, may also predispose someone to pneumothorax. It is associated with an increased work of breathing as well as the potential to trap gas, retention of carbon dioxide and collapsed lung. In addition, anecdotal reports suggest that restrictive lung disease may predispose someone to decompression illness.

The best treatment to prevent recurrence of pneumothorax is a topic of much discussion and will not be discussed here. Those with questions may contact the DAN office on 03 9886 9166 or via email info@danasiapacific.org.

Finally ...

Although good health is important to safe diving, there's a little wiggle room with some conditions. Many conditions once thought to be incompatible with recreational diving are now considered generally acceptable, with some caveats: The diving must be performed with the proper preparation, the appropriate consultation with your diving physician, and the diver must, at all times, exercise caution.

Different diving environments require varying levels of individual fitness. The dedicated medical professionals at DAN are always happy to help you find the information - and medical help - you need.

*In either test, the patient breathes in nebulized methacholine or saline, which provokes narrowing of the airways.

Airway constriction is detected when the patient performs spirometry, a pulmonary function test that measures lung function, specifically the volume and/or speed (flow) of air that can be inhaled and exhaled. People with asthma react to lower doses of inhaled methacholine or saline.

About the Author

John J. Freiburger, M.D., MPH, is board-certified in anesthesiology, critical-care medicine and undersea and hyperbaric medicine. Associate medical director for DAN, he is an attending physician at the Duke Center for Hyperbaric Medicine and Environmental Physiology.

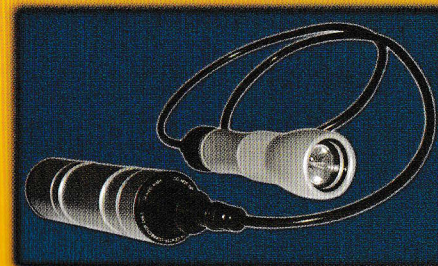
Who is the Divers Alert Network (DAN)?

For scuba divers worldwide, DAN means safety, health and peace of mind. DAN are the experts in diving accident management. The organisation is committed to improving the safety of diving for all divers. DAN strives to achieve this goal via activities that include providing Worldwide Emergency Evacuation Coverage and optional Dive Injury Insurance Services for Members; funding and/or manning 24-hour diving emergency hotlines throughout the region; offering non-emergency diving medical advice, accident management training; and undertaking data collection and research to enhance dive safety. www.danasiapacific.org

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CDAA Member Profile ~ Toby Passauer #4709 ~



Since the day I could differentiate between a regulator and a snorkel, I've been harassing the great team at 'Ocean Divers' and Through Warrick & Jane, I achieved my CAVern rating in the hotpot period of January this year (amongst the blowflies and dust).

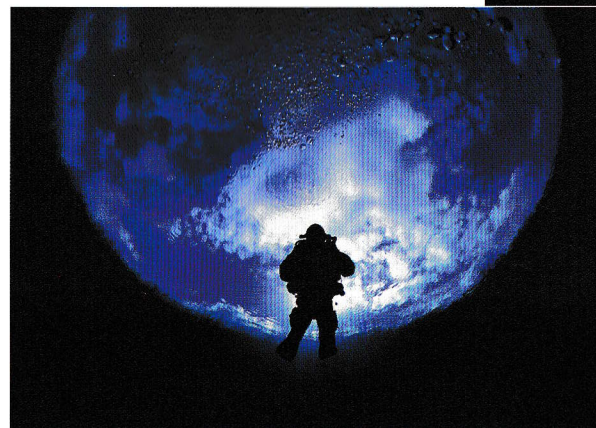
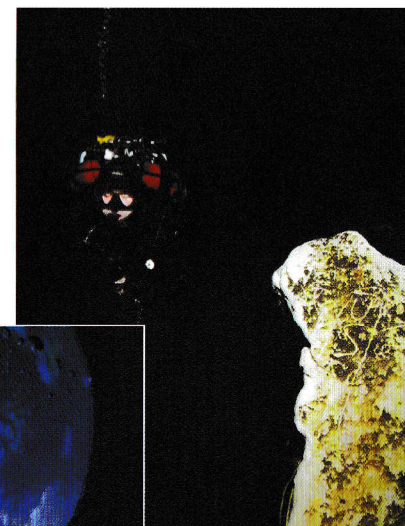
My gear consists of the blue H (Halcyon) and Santi garb for thermal protection (including the Santi coffee mug). My air is regulated by Apeks and my lantern is a 'Light Monkey' HID as well as the OLED Liquivision display (which could quiet possibly act as a backup light source).

Like most of the automotive industry employees, I've recently become a redundant Machine Setter, but was fortunate enough to have been introduced to diving via a 'Cave Diving' work colleague back in 2008, who patiently answered all my novice questions during lunchbreaks between mouthfuls.

I'm very lucky to have such a great dive buddy (AKA Lucas), who assists with my photography and acts as my subject where ever we dive. I use the Cannon G12 (FIX Housing) with twin INON strobes and have to thank Liz Rogers for sharing her abundance of knowledge.

After getting a taste of fresh water at Mt Gambier, I've rarely returned to the salt water of Port Phillip Bay, with the exception to do further courses & practice for Cave at murky Mornington.

My last dive I realized it is actually possible to encounter 1m visibility near Point Lonsdale during our Tec40 course (reminded me of Gouldens). A week before we were enjoying the inky blackness of the Shaft and transparent waters of Kilsbys.



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	DEWNR - P.O. Box 1046 Mt Gambier 5290 (08) 8735 1177	Groups of 6 or more, phone/mail to Dept. for Environment, Water & Natural Resources (DEWNR) Smaller groups, no need. Fax: (08) 8735 1135
Gouldens	CN	DEWNR	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	DEWNR	Divers must have the correct CDAA diving endorsement for the site and carry current financial CDAA membership card. The diver must have signed an indemnity with DEWNR before access is permitted and original copy must be received by DEWNR prior to diving.
Fossil	C		Training: The Instructor is to notify DEWNR of the date the sites are needed and to forward signed indemnities from each student and their temporary card number/ membership number. Permit holders by phone or fax. Be aware of delicate vegetation. \$26/dive or annual Permit \$60.
Piccaninnie Ponds	S	DEWNR	NOTE: Members can login to www.cavedivers.com.au and download pre-populated indemnity forms and these must be submitted to DEWNR at least 2 weeks prior to the intended dive date.
			NOTE: Divers should renew their Piccaninnie Ponds indemnities at least 2 weeks prior to their intended dive date.
Horse & Cart	CN	Peter Cunningham	By phone or mail, 1 week prior. Ph: (08) 8738 4003.
Tea Tree	CN	PO Box 2168, Mt Gambier 5290	
Little Blue	S	District Council of Grant	Permission not required - must carry card.
Allendale	C	District Council of Grant	Obtain key from Lady Nelson Tourist Information Centre.
Ela Elap	S	Mr. Peter Norman	Visit the house before diving.
One Tree	S		If no one is home - no dive!

FORESTRY SA SITES

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

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

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

Kilsby's S Landowner leased to CDAA Access - We have access fortnightly. Minimum of 3 divers in the water at one time. Refer to CDAA website. Twin Tanks - Maximum depth of 40 metres on Air.

Meet at gate of property at 8.55am or 12.55pm. Book on-line at www.cavedivers.com or contact Craig at kilsby@cavedivers.com.au

No animals, visitors or mid-week diving allowed. No diving on Total Fire Ban Days.

BARNPOOLUT SITES

Ten Eighty	S/C	Scotts Agencies P/L	Access: ALL BARNPOOLUT SITES ARE CLOSED.
Blacks Hole	S/C	Scotts Agencies P/L	
Shaft	S/C	Generally open one weekend a month. Trevor Ashby	For access dates refer to Guidelines or the CDAA web page. Nitrox as a diving mix is not allowed in the Shaft unless a trimix endorsement is held but deco mixes attached to the shot line are permissible. Refer to Shaft access bulletin within CDAA Regulations. Divers applying to dive in the Shaft for the first time must document dive experience with twin tanks. Download form off website.
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: 08 8723 5552	Download Indemnity from Web Page. Access available for experienced Penetration divers only. Access agreement must be signed prior to diving. Allow 4 wks for indemnity process.
Three Sisters	P	Millicent Council	Contact Email: site@cavedivers.com.au
McKay's Shaft	S		Access Manager: David Fielder. Email: tankcave@cavedivers.com.au
Tank Cave	P	CDAA	Access Manager: Matthew Skinner. Email: bakers@cavedivers.com.au
Baker's Cave	C	Manager: Brad Dibble	Climbing equipment required.

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		The Department of Regional Development and Lands, Perth, South East Region. PO Box 1143, West Perth 6872. Contact Shannon Alford, E: Shannon.alford@rdl.wa.gov.au
Tommy Grahams	C		Phone: (08) 6552 4661 Fax: (08) 6552 4415
Weebubie	S/C	DPI	

N.S.W. - WELLINGTON CAVES

Limetkin (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 (Antidine)	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.



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