

TRIP REPORTS

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!



Canoe on Weebubbie Lake
Photo: Capt. J M Thomson collection.

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 history of human adaptation and endeavour since settlement.

History records that two telegraph operators from the Eucla 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-Junnaibil, apparently translated as “slippered 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 Eucla 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 Eucla 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 next page). 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 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.



Lowering a canoe into Weebubbie sinkhole
Photo: Capt J M Thomson collection.



Winching into Weebubbie sinkhole
Photo: Capt J M Thomson collection.

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, Rover Scouts, Captain Thomson and some of his experienced mates and researchers from the South Australian Museum. Almost immediately Captain Thomson left CEGSA partly 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 had no connections with 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



Early explorers at edge of Weebubbie Lake
Photo: Capt J M Thomson collection.

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. Recently I spoke to his surviving son and daughters to arrange a further meeting to look through his original glass slides which they still possess.

CEGSA organised the first Nullarbor Scientific Cave expedition in 1956-57. 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 spotted it! On that trip I swam the length of the lake (no wetsuit!) with a Pinnocchio mask and snorkel and looked down into that enormous sump at the end. Then I swam back and announced to everybody, "*I'm taking up SCUBA 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.

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 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 Denise from our expedition in a cowskin but we didn't want anything to do with it as we 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 – divers can see them on their 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 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!

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 1metre 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.

The map is reproduced with CEGSA's permission. Although I did the survey and drafted it, it is part of CEGSA's official records, so it is copyright, but CEGSA recently agreed for me to publish it in the CDAA "Guidelines" journal as it was a great opportunity to show it to the cave diving community after so many years for divers 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 Cocklebiddy 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!

So where does all the stormwater runoff go? 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 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-EI-Elevyn 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.

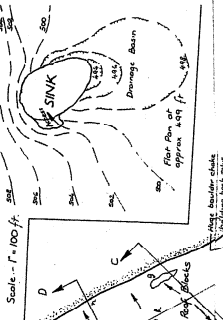
Pete and I have been working on understanding the "warmer zone" of cave waters reported by many divers over the years around Tommy's, Murra, Pannikin and Inner Cocklebiddy. We are very interested to see what kind of geological and hydrological links there might be as the Nullarbor limestones are very 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 Hoo 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 beaut that

SURVEY NOTES

1. Levels are based on a point marked on the roadbed shown on the plan as Datum A 2007, which is the arbitrary R.L.
2. The survey done by the lakes used a mineral oil on metallic tape. CRC 6 & 4 were used for the main line. Roof and cross-sectional details were obtained from their levels found by trigonometrical methods.
3. The survey to the end of the lake surface was made by the 1957 Nullarbor Plains expedition of CEGSA of the composition with the first National Geographic Society expedition. The survey was done by D. K. Lanyon, Surveyors - R. Sartin, T. Edgely, M. Stoughton and D. K. Lanyon.
4. The lake surface was surveyed on 3. Also by J.B. Howard, S.W.S.S. before the lake was drained. Below lake surface in feet below 1957/58 water level.
5. Underwater extensions of the main lake and the small lake were explored and surveyed by the Nullarbor Cave Diving Expedition, Jan. 1972. Depths of the lake were also obtained by Diver/Surveyors and D. K. Lanyon, T. Edgely, M. Stoughton and R. Turnbull. CRC 3 obtained.
6. Eastern Ring Rocks, discovered and surveyed by M. Miles (Marine SS. N.S.S. 1953) from C.A.C. 3 on the 1972. Diving Expedition, C.A.C. 3 obtained.
7. Drown - D.L. Lewis, March, 1972 from survey by R.T. Sartin, Jan. 1957, J.B. Howard, Jan. 1960, D.L. Lewis and M.T. Miles, Jan. 1972.

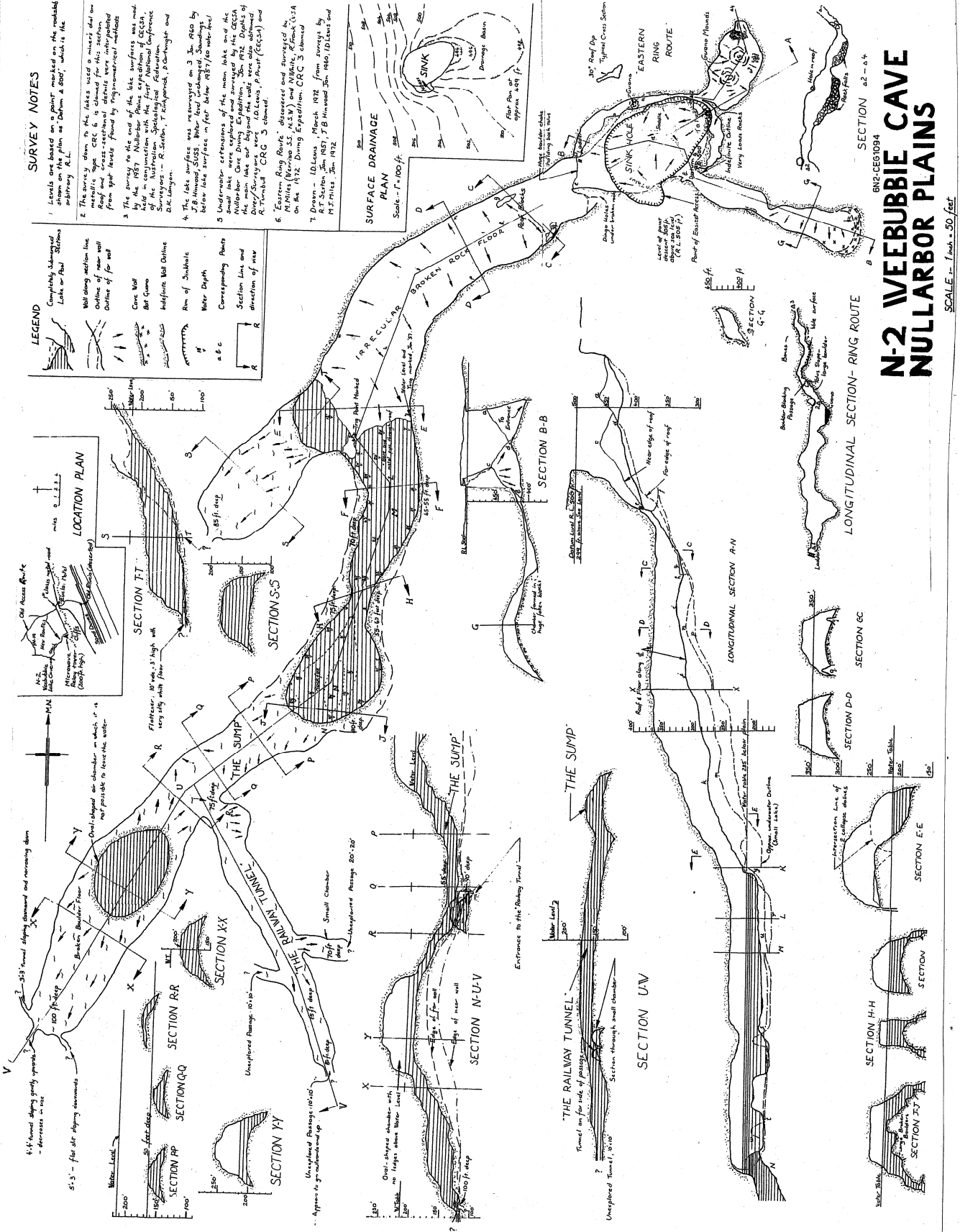
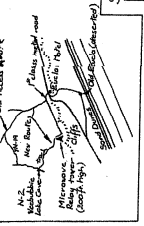
SURFACE DRAINAGE PLAN
Scale - 1" = 100' ft.



LEGEND

- Complete, advanced Lake or Pool Station
- Wall along section line
- Outline of new wall
- Outline of old wall
- Cave Wall
- Bit Gumbo
- Indefinite Wall Outline
- Rem of Substrate
- Water Depth
- Corresponding Point
- Section Line and direction of view

LOCATION PLAN



N-2 WEEBUBBIE CAVE NULLARBOR PLAINS

SECTION a2 - a4
6102-CEG1094

SCALE - 1" = 50' feet

4 1/2" tunnel sloping gently upward - depression in rock

5 1/2" - 4" air sloping downwards

Water Level

3 1/2" tunnel sloping downward and increasing down - depression in rock

Water Level

5' - 6' air sloping downwards

Water Level

3' - 4' air sloping downwards

Water Level

2' - 3' air sloping downwards

Water Level

Over-shaped air chamber in which it is not possible to leave the water

Water Level

Over-shaped air chamber with water level

Water Level

Over-shaped air chamber with water level

Water Level

Over-shaped air chamber with water level

Water Level

Over-shaped air chamber with water level

Water Level

Unexploded Average 10-15'

Applies to 3' chambers and up

Unexploded Average 10-15'

Applies to 3' chambers and up

Unexploded Average 10-15'

Applies to 3' chambers and up

Unexploded Average 10-15'

Applies to 3' chambers and up

Unexploded Average 10-15'

Applies to 3' chambers and up

Unexploded Average 20-25'

Small Chamber

7 1/2' deep

Unexploded Average 20-25'

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Small Chamber

7 1/2' deep

Stef was involved as there is great current interest in the links between biology, geology and hydrology over the long time frame of Nullarbor Cave formation. Catalyst have scheduled their Documentary on Weebubbie Cave for February 21st, 2013 (before this Newsletter is out) so we'll tape it for a meeting night. Liz has provided a selection of her brilliant photos for in this article as an indication of the underwater footage you will see in the program.



Stefan at the start of the main lake.

Ian diving in the beautiful main lake.

Photos: : Liz Rogers – www.lizrogersphotography.com ©



Stefan in the enormity of the railway tunnel where it widens. Photo: Liz Rogers – www.lizrogersphotography.com ©.

Weebubbie Lake.
Photo: Brian Kakuk.



Far left hand end of Weebubbie.
Photo: Ken Smith.

Railway Tunnel.
Photo: Martin Farr.

All of us would like to thank the CDAA committee and particularly National Director 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 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.

Ian D Lewis, CEGSA # 6701

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Corra Lynn Cave, 5Y-1, 27th December 2012

Participants: Graham Pilkington, Damien Pilkington, Isiah Pilkington, Juliet Pilkington, Charlie Pilkington and 3-month Introductory members Charni Pilkington, Rodger Pilkington, Siona Pilkington, Jamie Schmidt.

A Christmas treat for my relatives and a way to shed some of the weight gain from all the partying. We didn't see much of the cave beyond Grand Central, Crystal Maze, and the run out to Bushwalkers but this was plenty for some of our participants.

Graham Pilkington

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Cliefden, NSW, 11-16th January 2013

Participants: Graham Pilkington and other attendees from the 29th ASF Biennial Conference.

I arrived late on the 11th at the luxury of an old shearer's quarters run as a caver's hut by Orange Speleological Society (our host for this post-conference caving trip). The Cliefden Hut has bedrooms, mains power, running water, hot showers, fridges, stove, microwave, all the other mod cons including a lounge room; and even a flush toilet.

During this time I visited the following in order: Island Cave (2CL-6), Gable Cave(2CL-7), Main Cave (2CL-1), Murder Cave (2CL-2), and Trapdoor Cave (2CL-4). Some of these have multiple entrances; we did a through trip of Main coming out of the lower entrance 2CL-47.

The Cliefden caves are very well decorated and usually require no vertical gear. They vary from dry and dusty to dripping wet mud with pools. The larger caves are typically located close to a river or creek in limestone headlands and rocky hills that show prominent bedding ridges.

Graham Pilkington

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George & June's Conference Trip

- 1) ATTENDING THE 29TH BIENNIAL CONFERENCE OF THE AUSTRALIAN SPELEOLOGICAL CONFERENCE, FROM 6TH-11TH JANUARY 2013.
- 2) PLUS OUR RETURN JOURNEY 12TH-18TH JANUARY AFTER THE CONFERENCE BY GEORGE AND JUNE MACLUCAS, (GEGSA MEMBERS.)
- 3) CAVES VISITED 2-16E-4 ON 13TH JANUARY IN BOODEREE NATIONAL PARK NSW.