# The collapsing Nullarbor: Weebubbie Cave 6N-2

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This paper is designed to complement a recently-published article in *Caves Australia* relating to a rockfall that occurred just inside the entrance of Weebubbie Cave 22 years ago.

# The collapsing Nullarbor. Nullarbor Plain — South and Western Australia

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Straddling the border of South and Western Australia, the Nullarbor Plain at 250,000km<sup>2</sup> is the largest expanse of limestone in the world. The climate ranges from semi-arid in coastal regions to hot-arid in the northern sectors. While average temperatures can be 'mild' — annual temperatures at Eucla [near the border with South Australia] for example can vary from 18°C to 26°C although I have experienced one blistering summer's day of 53°C while on nearby Mundrabilla Station.

Rainfall can be infuriatingly spasmodic and tightly concentrated. The average rainfall at Eucla is 255mm and 231mm at Nullarbor Station in South Australia. Droughts are common. A lot of moisture is delivered to plant life by way of early-morning dew. On numerous occasions, however, I have witnessed intense rainsqualls less than a kilometre across ranging over the landscape and once shared the discomfort of having a year's supply of rain dumped on a campsite at Cocklebiddy Cave in the space of an hour.

The Nullarbor Plain was first sighted from the sea by Dutchman Francois Thijessen in 1627 and charted by Matthew Flinders from the decks of the *Investigator* during January 1802, and traversed by Edward John Eyre in 1841. [Collins 2008]

The Nullarbor Plain is principally made up of two layers of limestone, a relatively hard crystalline caprock commonly known as Nullarbor Limestone that varies in thickness from 12–45m, and the underlying pale, chalky polyzoal limestone known as Wilson Bluff Limestone, that can be 55m or more thick and interspersed with flints, that in some cases were mined by the aborigines for tools and trade.

Being the first and ultimate DIY-er, once Mother Nature created the Nullarbor, she set about changing it, with all the tools and time at her disposal. As a result, the Plain is interspersed with numerous caves, multiple environmental zones and, where it meets the Great Southern Ocean, spectacular 80m high cliffs. Until the arrival, colonization and exploration by Europeans, the changes to the various features of the Nullarbor went largely un-noticed. Many Europeans considered it a hostile, featureless and waterless obstacle to communication between the eastern and western seaboards — a view still held by many today. The vastness of the Nullarbor was ultimately 'conquered' by the construction of the 'Inter-Colonial Telegraph Line' [in the 1870s] and the Transcontinental Railway during the early part of the 20th century. This encouraged pastoral pioneers to venture throughout the region to pit themselves against the unforgiving environment.

Others also pitted themselves against the seemingly insurmountable distance between Israelite Bay [WA] and Fowlers Bay in SA, some on foot while others utilized bicycles and later, primitive motor vehicles. There was no road as such — if anything, just a service track following the telegraph line.

In the summer of 1897-98, Frenchman Henri Gilbert spent three months trekking the Nullarbor, aided only by a linesman who left supplies of water at strategic locations and the fact that the telegraph poles were numbered, later commenting that the Nullarbor was 'the most difficult part of my [trekking] journey round the world ...' He had been preceded by Arthur Richardson, who in 1896 had become the first person to ride a bicycle across. [Collins].

With the dawning of the 20th century and the entry of 'reliable' motorized vehicles though still with no recognizable road, the potential for disastrous crossings was always present — and they occurred. There were, however, many examples of 'bushman's ingenuity'! One such occurrence was in 1928 when Mr and Mrs Turner and their four children attempted the journey in their 1924 Buick, striking serious engine problems halfway across. They completed the journey after Mr Turner re-ground the engine valves using a mixture of sand, oil and sugar. [Collins]

The Eyre Highway between Norseman [WA] and Ceduna [SA] did not come into existence until 1942 as a wartime measure. With the exception of the Madura and Eucla passes, it was a dirt road for the entire 1,200km distance. The 690km Western Australian section became a sealed road during the early 1960s, while the sealed and re-aligned South Australian section of the highway was not opened until the mid-1970s — which had a devastating impact on the 'virgin' wombat population.

With the re-alignment of the highway, and its closer proximity to the coastline, the South Australians took the opportunity to upgrade the existing [now shorter] ad-hoc spur roads and built several new spur ones [five in all and unsealed], giving easy access to view the spectacular Bunda Cliffs and three for the Merdayerrah Sandpatch region. Infrastructure in the form of information and warning signs along with some barricades were included — and largely ignored. It did not take long for travellers to begin creating additional tracks, especially one running parallel to, and very close to the cliffline. Cliffline vegetation was denuded, allowing erosion of the thin soils. Several years later, Mother Nature began to make her remodelling talents visible.

The caprock of the Nullarbor limestone could be tough, but not so the underlying strata. Exposed to the full force of the Great Southern Ocean, storm winds, rains and intrusions of salts, the 80m cliffs periodically broke down. It was not unusual to see relatively thin flakes of surface caprock jutting out from the cliffline with no support underneath. Huge cracks began appearing in other quarters: some subtle, others quite obvious. Visitors seemed oblivious to or contemptuous of these hazards and continued to walk up to the very edge of the cliffs to get their 'perfect' cliffline photographs and selfies. At one viewing point, still in use, a small undated memorial has been discreetly placed that may indicate that at some stage, a girl may have fallen over the cliff edge. By 2013 the authorities had moved in to begin protecting the public from themselves by closing most of the suspect viewing points, to the extent of using heavy ripping equipment to thoroughly destroy the road surfaces, and in some instances installing chain barricades across at the highway's edge. As a result, determined travellers walking in from the highway can often have a challenging though rewarding experience.

**But what of the Nullarbor caves?** Have they suffered similar collapses? I cannot comment on the caves within the South Australian Nullarbor National Park or Regional Reserve as I have rarely visited those regions due to the difficulty of gaining permission for entry. However, I have frequently visited caves in the Western Australian sectors, particularly those on pastoral leases. Collapses and rockfalls have naturally occurred with some documentation, unfortunately resulting in a history of managerial closure.

The first 'very public' cave collapse occurred in 1988 just east of the Cocklebiddy Roadhouse, when a sudden, short and concentrated cyclonic rainstorm event dumped an estimated two years supply of rain over nearby **Pannikin Plain Cave** [within the Nuytsland Nature Reserve administered by the Department of Conservation and Land Management — CALM] as a party of cave divers were in the process of de-rigging the cave following a successful program. The subsequent entrance collapse trapped the party in the cave until a relatively safe passage through the unstable rockfall could be found. The cave is still officially closed to this day — 30 years after the event.

**Cocklebiddy** and **Murra El Evelyn** caves, to the west of Cocklebiddy Roadhouse, are also in the Nuytsland Nature Reserve. Cocklebiddy Cave, with its long, valley-like collapse doline, became internationally 'famous' due to its long underwater passage that has ranked it as being the longest in the world [6.4km], along with its ultra-clear waters. Despite CALM expending considerable resources and presenting it as a passive tourist attraction, shortly after it was 'opened', a subsequent rockfall led to its premature closure.

**Murra El Evelyn Cave** suffered a similar fate. Situated much closer to the Cocklebiddy Roadhouse, this cave with its flat, circular, vertical collapse entrance was most likely mined for bat guano during the early part of the last century, as when I first visited the cave in 1972, it had a thick wire rope used for hauling strung from a convenient tree running down the entry slope to an anchor point. To aid entry, a primitive, 'thought-provoking' 'bush ladder', made from three tree trunks, with genuine 1m rung spacing, all held together with generous amounts of fencing wire, was propped against the 4-5m cliff entrance. This cave quickly reached the water table, which made it an attractive cave dive site. There seemed to be little or no evidence of surface rock disturbance, suggesting that any collapse was perhaps beyond the daylight zone.

**Mullamullang Cave** has also suffered a rockfall in the recent past, an internal one this time. It happened some time prior to 2003, which was when I encountered it. In a cave that has multiple rockpiles along its entire 5km length, how do you determine that there has been another fall? Following the marked trail in from the entrance to the Smoko Junction–Sandschute region between Stations 73–84, evidence of freshly fallen rock was readily seen, right across the trail, and cleared away. Anybody walking under it at the time would have ended up with a terrible headache! Another minor fall near Station 84 was made up of fossil lake-levels. A strange sort of structure to fall out from a ceiling? [Poulter 2004] What could have caused this fall?

The answer could be quite simple — **salt intrusion**. It can be difficult for some people to accept that many caves of the Nullarbor are still actively forming, via salt exudation. Strangely enough, the first example I saw of this phenomenon was in Edie's Treasure of Tasmania's Exit Cave back in 1971, where I saw an extruded gypsum needle that had lifted a flake of limestone. The best Nullarbor examples I have seen are seams of salt intrusions more than 50mm thick slowly wedging between bedding planes in Witches Cave on Mundrabilla Station, and the steady destruction of ancient calcite decoration in many other Nullarbor caves. An easy experiment in Nullarbor cave chambers is to hold a single

bright light beam above one's head to see if the air is filled with ultra-fine particles drifting towards the floor. These particles will be made up of salts and rock, the ingredients of the decoration commonly referred to as 'Coffee & Cream'. It can also be attributed to many 'dud' photographs using 'flash on camera Happy Snappers'.

And so we come to **Weebubbie Cave**, the very first Nullarbor cave that I visited in January 1972 and have been associated with ever since. The cave comes with an even longer history. I advise at this juncture that an abridged version of the following is appearing in the December 2018 edition of *Caves Australia* #206.

Weebubbie Cave [6N-2] is located some 12km north-west of the present-day 'township' of Eucla on the Hampton Tableland of the vast, arid Nullarbor Plain, a short distance west of the South Australian border. The ruins of the Eucla Telegraph Station, only 20km south of the cave, are situated close to the beachfront on the Roe Plains. This was once an important communications centre of the 'Inter-Colonial Telegraph Line', the only telegraph station between Israelite Bay [180Km east of Esperance] in Western Australia and Fowlers Bay in South Australia [885km] to be serviced by a jetty enabling supplies to be delivered by sea.

From a historical aspect, Weebubbie Cave has probably been known to Aboriginal Australians for thousands of years. They reputedly mined flint from the cave walls for use as stone tools and to trade with. The cave is a registered archeological site as was designated by a small plaque placed near the cave entrance, as seen by myself in early 1972, but long since disappeared.

The cave was not 'discovered' by European Australians until two employees [Clayer and Junken] of the South Australian Telegraph Department chanced upon it in early 1900 [Poulter 1987]. They were no doubt impressed by the sheer size of the collapse doline but, more importantly, the volume of water the cave contained. The pair then lodged an application for a 80,000 acre [32,375 hectare] grazing lease encompassing the cave.

While granting the pair a 40,000-acre [16,187ha] lease on August 2 of the same year, the Surveyor-General also placed a temporary reserve of 5,000 acres [2,023ha] around the cave. Clayer and Junken then sought compensation for 'finding' the water resource in an otherwise waterless environment only to lose access to it. The government favoured granting a reward [provided a government-appointed inspector submitted a favourable report as to the water quality], suggesting the pair nominate a suitable sum. The government's friendly attitude changed when the pair applied for a £500 reward [a huge sum in those days] and despite much telegraphic prodding from the pair, the government failed to dispatch an inspector to sample the water.

However, during March 1901, John Muir, Inspector of Engineering Surveys PWD, was examining the country between Kalgoorlie and Eucla in relation to either constructing a future transcontinental railroad direct to Eucla and thence to Tarcoola in South Australia, or sending a spur line down to Eucla from a more northerly east-west route. The reasoning behind such an idea would have been to carry supplies for the railroad construction utilizing the already existing Eucla jetty. On meeting Muir, Clayer and Junken persuaded him to inspect the cave's water and forward his opinion to his superiors. Muir's October 1901 report to parliament, accompanied by three interior photographs of the cave, concluded the lake to be a 'small underground reservoir' due to the 'impervious character' of the surrounding strata and that the estimated 3 million gallons was of highly mineralized water not suitable for stock.

On the strength of this report, a no doubt relieved Surveyor General refused a reward to Clayer and Junken, despite their protests that Muir's observations were no more than casual and that he was not qualified to pass judgment on the water quality. The government, however, was unmoved and shortly afterward Clayer and Junken left the area.

Attitudes change with time and in December 1927, a proposal was made to give the reserve permanent status and lease it in order to raise money from the resource. On 4 January

1928, Water Reserve #19713 was duly leased to JD and OD Jones for grazing purposes at 10 shillings/year, subject to the **public having free access** to the water. The lease was cancelled in 1930 due to non-payment of fees. Subsequent attempts to re-lease the cave's resource appear to have been short-lived.

During 1964 there was a minor panic when, on referring to the relevant Army 1:250 000 survey map of the day, it was discovered that the cave was no longer in the centre of the reserve that had been thrown around it in 1901. In fact it was a respectable distance outside the boundary. That revelation and rectification later in the year would no doubt have done justice to a latter-day 'Yes Minister' script.

Before leaving this gem of comedy and for those interested in modern PRECISION surveys where accuracy to the nearest millimetre is expected — and even demanded — here is the official 1967 description of the cave reserve boundaries:

'All that portion of land (being **about** 2560 acres) with (Weebobby) cave as its centre bounded by lines starting from a point situated **about** 987 chains and 53 links west from north-east corner of pastoral lease 393/512 (Moopina) and extending south **about** 160 chains; thence west **about** 159 chains and 98 links thence north **about** 160 chains and thence east to starting point.'

Then, to round out all those approximations, the reserve was metricated in July 1976 to **APPROXIMATELY** 1035.9952 hectares!

Prior to 1964, the cave had been periodically known as Weebobby. There is also a reference that it was referred to not only as Weebubby, but Weebobby Pool [File #5431/00 P.52] and reputed to mean 'Place of Hidden Feet' in the dialect of the traditional Mirning aboriginal language. [Hadland 2018]. The name Weebubbie did not appear in correspondence until 1967 when F.E.B. Gurney sought permission to use the cave's resource to water stock on his nearby Moonpina Station.

The name Weebubbie is apparently derived from the Jirkla-Mirning Aboriginal words Wipa [ant] and Kapi [water] meaning 'trails of ants leading to the cave's water at night'. [Readon 1996] Formal approval of the name Weebubbie was granted in April 1968 following representation from David Lowry, then of the WA Geological Survey.

There is no record of Gurney taking up the water lease from Weebubbie. Initially, water was extracted by a pipeline laid from the cave's minor lake out through the entrance of the cave. A small but heavy Lister diesel pump unit located at the edge of the lake provided the power. Prior to 1972, a hole was drilled through the ceiling of the main lake allowing easier access to the water, utilizing an electric pump to supply water to the nearby Eucla Roadhouse, the pipework appearing in many published works. [Deacon 1985, 1986, Morrison 1981] The ceiling pipework was removed prior to 1985, although some lengths had fallen through into the lake.

Weebubbie had been used as an ad-hoc tourist attraction during the 1960s and into the early 1970s. In addition to the Eucla Roadhouse exploitation, it is possible that the cave's water resources were also utilized during the sealing of the Western Australian section of the Eyre Highway in the early 1960s. All these activities resulted in a considerable amount of rubbish being dumped in the cave, including a lot on the bottom of the main lake. This took the form of the already mentioned steel and PVC pipework, Lister diesel-powered pump as well as oil drums, timber, light fittings, wire and insulators as well as tourist-generated litter both in the cave and the entrance doline. A few 'dead' tyres had been thrown into the doline for good measure.

Systematic exploratory cave diving did not occur until 1971-72, when Ian Lewis conducted the first Cave Exploration Group South Australia [CEGSA] Nullarbor cave diving expedition. At Weebubbie Cave, in addition to discovering the mysterious underwater growths and extensions, extensive side passages leading off from the entrance doline were also

discovered. [Lewis 1972] The waters of Weebubbie Cave [in addition to other caves containing ultra-slow moving water of the Nullarbor] are world renowned as being of the utmost clarity, rivaled only by South Australia's famed Piccaninnie Ponds.

During the Christmas period of 1985-86 and again in 1989-90, the Speleological Research Group Western Australia [SRGWA] organized a multi-society expedition to remove the several tonnes of rubbish from the cave [Poulter 1987, 1990]. Since the cleanups, very little tourist-generated rubbish has been noted — this could be partly attributed to the cave falling off the 'tourist radar' and removal of infrastructure.

# Some notes on the Reserve #19713

Following the European discovery of Weebubbie by Clayer and Junken in 1900, the Surveyor-General placed a temporary 5,000 acre [2,023ha] reserve around the cave. A permanent reserve was established in 1928, a partial description of which follows:

The legal area of Reserve #19713 is 1,035.9952ha [2,560ac] whose purpose is 'Landscape and Aboriginal Culture and Heritage Protection and Conservation of Fauna'. It is a Class 'C' reserve and the responsible agency now being the Dept. of Regional Development and Lands [Landgate]. The date of the last change was April 20, 2011. The 'Additional Reserve Information' lists the reserve as 'Comprises of Lot 300 on DP69595 limited in depth to 20 metres (L566764)'. [McDonough 2018]

# Quite apart from the size of the reserve being seemingly whittled down by almost half over the years, what about the DEPTH! <u>20m</u>? The depth of 20m doesn't even 'protect' the bottom of the doline, let alone the Cultural, Heritage and Conservation of Fauna values inside the cave!

Due to the fact that Weebubbie Cave is home to colonies of swallows living in the entrance zone and bats congregating at the far end of the main lake and elsewhere, guaranteeing a constant input of surface energy, there is a naturally diverse fauna regime also present. 'Caves of the Nullarbor' [1967] listed the following species from Weebubbie:

Araneae indent.,	<b>Spinturnix</b> sp. [bat parasite],
<b>Acarina</b> indet. [bat parasite],	Polyzosteria pubescens Tepper (accidental),
<b>Rhaphidophoridae</b> sp.,	Psyllipsocus ramburi Selys-longchamp,
<b>Speotarus</b> sp.,	Brises acuticornis Pascoe,
Lathridiidae sp.,	<b>Chalinolobus morio</b> (Gray).

Since that publication, four more troglobites have been discovered from the cave:

Possibly 1971 – **Janusia muiri** (spider) – most likely the first discovery of this species.

1981 — Isopod (undescribed) — Robert Poulter

1982 — Cockroach (undescribed) — Norman Poulter

1985 – Beetle **Speozuphium poulteri** – [Moore 1995]

## The lead-up to the Weebubbie collapse

The cavernous coastline of the lower South-West of Western Australia between capes Naturaliste and Leeuwin [as well as further north] is made up of what is commonly known as Coastal or Dune Limestone. Rich in silica, it can be quite porous and extremely friable. At Gracetown, a small coastal village just north of Margaret River, there is a popular surfing beach with adjacent limestone cliffs. Amongst the cliff-line was an overhanging ledge [approx. 6m long and 2-3m deep (Paice 2018)] that provided beachgoers with a convenient, elevated all-weather shelter and sandy viewing point that ultimately became a safety concern to some residents and land managers alike. Unconfirmed reports suggested that 'remedial actions' may have been undertaken at various times, and may have unknowingly partially destabilized the ledge. During a high school surfing event, held in inclement weather<sup>1</sup> on **27 September 1996**, while numerous people were sheltering underneath, the ledge suddenly collapsed, killing nine people, four of them children. It was ironic that an event organizer, whose wife was earlier imploring him to call off the event, was among those killed<sup>2</sup>. [De Poloni & Woods 2016] There were other minor injuries. The effect on the regional communities was to be devastating and long-lasting.

# The collapse at Weebubbie Cave, 9 October 1996

**TWELVE DAYS LATER,** a roof collapse occurred just beyond the weather line of Weebubbie Cave. A party of cave divers from South Australia was in the cave at the time — though nowhere near the collapse site. A power cable and 6mm copper airline passing from the surface were buried under the collapse. A group of Girl Guides, led by a WA caver, had visited the cave the previous evening between 7:30 and 9:30pm, camping overnight, leaving the area the morning of the collapse.

At the time of the collapse, Weebubbie Cave was under the jurisdiction of the Department of Land Administration [DOLA] who readily admitted to being administrators, not managers. No doubt influenced by the Gracetown tragedy, DOLA immediately closed access to the cave and sought advice from the Department of Mines as to what other action should be undertaken.

The cave was promptly visited by Ian Misich [Geotechnical Engineer, Mining Operations Division] of the Department of Mines. He submitted a short report accompanied by several photographs. On the strength of the Misich report, DOLA now permanently closed the cave, had the uppermost ladders removed and commissioned five large signs to be erected in strategic locations advising the general public that the cave was closed. **There was no distinction between untrained members of the public and experienced speleologists or cave divers.** 

The closure signs were apparently installed during early December, 1996, one unfortunately within view of the Eyre Highway [acting as an attractant] and another adjacent to the nearby microwave tower, which served as the beginning of the rough track leading to the cave. Two signs were placed at the cave itself, one adjacent to the doline access point, with the other in the camping area. The fifth sign was erected at a track junction of the Eucla-Reid road.

At the time of the collapse, SRGWA was already preparing for an expedition to the Nullarbor and in early December began negotiations with DOLA to gain access to the cave in order to ascertain for itself the severity of the collapse and potential for further rockfalls. This was prompted in part by conflicting media reports immediately after the October collapse. Those reports inferred that several thousand tonnes of rock were involved. The Albanybased Regional Manager of CALM, [Department of Conservation and Land Management, the Western Australian equivalent of a National Parks Authority], supported the SRGWA application. CALM manages the Nullarbor's Nuytsland Nature Reserve, which contains numerous caves, several of which are highly significant and embody lakes. CALM also administers access to other Nullarbor sites of interest to cave divers who were accredited by the Cave Divers Association of Australia [CDAA]. Given the WA Government's enthusiasm for expensive departmental amalgamations, CALM has since been merged into the Department of Biodiversity Conservation and Attractions Parks and Wildlife Service. Pity the poor receptionists who have to repeat that mouthful over the telephone multiple times a day.

In what could only be described as an '11th hour event', this author signed an indemnity form at 11:15am on Christmas Eve [1996, 45 minutes before the traditional knockoff time for the

<sup>1</sup> There is no Bureau of Meteorology weather station at Gracetown, but a short distance away and slightly inland, there is a recording station at Cowaramup [#9636 est. 1926] where 150mm of rain had been recorded between 1–23 September 1996.

<sup>2</sup> In the hours leading up to and including the time of the collapse, 35mm of rain had been recorded at the Cowaramup station. It may have been a more severe event at Gracetown.

Christmas–New Year holiday break] on behalf of the ASF Inc. that enabled all members of ASF [cavers and cave divers] who subscribe to the ASF's insurance policy to have access to Weebubbie Cave and all other caves on DOLA territory throughout Western Australia.

SRGWA visited the cave during 28–29 December 1996. Initial inspection revealed that, contrary to some media reports, the collapse occurred inside the cave, beyond the weather line and that the amount of rock involved proved to be significantly less than they implied. For a rockfall that was less than 3 months old, the newly fallen rock was remarkably stable.

Over the next two days, members conducted a survey of the rockfall area, the conclusion being that the collapse involved the natural weathering of a roof-step through salt wedging or the drying out of clay interbeds. This weathering process is common throughout the Nullarbor as the caves continue to evolve.

The survey also found that approximately 97m<sup>3</sup> of rock was involved in the collapse, creating another roof step, of which Weebubbie has several. As indicated in diagrams submitted in the SRGWA report to DOLA, the rockfall took place approximately 4-5m from the inner lip of the entrance cliffline and extended along the ceiling for 13.5m varying in thickness from 0.4–0.6m with occasional spurs up to 1m. The width of the collapse was determined to be 18m, approximately 80% of the passage width.

The entrance rockpile at the region of the collapse sloped at 27° and rubble from the fall occupied about 20m of the downslope area indicating that very little rolled downslope [approximately 7m]. The vertical distance that the rock fell varied from approximately 4m near the entrance to about 11m at its furthest point. For such a 'young' rockfall, only 2 or 3 rocks were found to move when trodden on or leant against. The determination was that the entire 97m<sup>3</sup> 'step' fell more or less as one piece, breaking up on impact.

Laboratory tests in Perth later revealed that the density of the fallen limestone was much less than that of pure limestone. Pure limestone weighs 3,140kg/m<sup>3</sup> while the rockfall sample indicated a weight of 2,066kg/m<sup>3</sup>. This placed the estimated weight of the Weebubbie rockfall at about 200 metric tonnes, considerably less than the 2,000 metric tonnes bandied about in the media.

SRGWA's report to DOLA was confident that the entire rock strata fell during the October collapse and that further rockfalls were unlikely in the immediate future, although as stresses built up or were relieved in other bedding planes as a result of that fall, minor falls could occur from those strata.

# 2018 and beyond?

In company with a Tasmanian neighbour, this author camped at Weebubbie Cave on the evening and morning of 11–12 September 2017 — almost 21 years after the rockfall. Although I wasn't looking out for them as we drove in from Eucla, in the darkness I did not notice the two signs that had been placed near the Eyre Highway or the old microwave tower. I didn't see any indication of the sign at the Reid Junction the next day as we departed.

The closure sign placed right near the cave entry point disappeared a long time ago. The remaining sign at the camping area looks quite sad, having fallen off one of its support posts, with the other quite rusted at ground level.

I would speculate that the removal of the short wooden 'bush ladder' at the very surface and the long fixed steel ladder further down has acted as a suitable deterrent, preventing most casual visitors from attempting to venture into the cave.

#### What has happened with Weebubbie Cave during the intervening years?

**Have there been further rockfalls? None that I have heard or read about!** It would be interesting to find out if speleological activity in the cave has declined since the rockfall.

SO! Is Weebubbie or any other Nullarbor cave more dangerous today than they were prior to their respective rockfalls?

I don't think so.

Cavers and cave managers alike must appreciate the fact that just because water isn't constantly flowing through Nullarbor caves, it doesn't mean that other more subtle factors aren't at play actively forming the caves around them. A rockfall or collapse is, after all, part of a cave's natural evolution.

A question that naturally arises with the closure of these four caves — was the ASF consulted before the closures, advised afterwards — or at all?

A quick solution to a 'reported' perceived, actual or general collapse is perhaps to erect a fence around it and install a few relatively cheap 'cave closed' signs — problem solved.

But who in management, in this modern climate of liability and its insurance implications, is prepared to deem a cave **'SAFE'**, and **WHEN**?

#### **BIBLIOGRAPHY**

1967 Dunkley J., Wigley T. Caves of the Nullarbor [2nd ed.] 1978. ISBN 0 9599622 8

1972 Doughton R. Under the Nullarbor, Skindiving in Australia Vol.2 #6, pp 8-11

1972 Lewis I. Nullarbor Diving Expedition, ASF Newsletter #55, p 6

1981 Morrison R. Australia. A Timeless Grandeur. ISBN 0 7018 1600 7, p 234

1985 Deacon C. Nudging the limits 'neath the Nullarbor, Australian Natural History Vol.21 #10, p 445

1985 Poulter N. Nullarbor Reflections, Australian Caver #108, pp 12-13

1986 Poulter N. The Cleanup of Weebubbie Cave, Caver's Chronicle Vol. 13 #1, pp 9-14

1986 Deacon C. Australia Down Under, ISBN: 086824 241 1, p 140

1987 Poulter N. The Cleanup of Weebubbie Cave, *Helictite* Vol. 25 #2, Proceedings 16th Biennial Conference, Australian Speleological Federation, pp 43-46

1990 Poulter N. Nullarbor Expedition Dec. 26 1989-Jan. 10 1990, Caver's Chronicle Vol. 17 #1, pp 5-9

1995 Moore B.P. Two Remarkable new Genere and Species of Troglobitic Carabidae (Coleoptera) from Nullarbor Caves, *Journal Australian Ent. Society*, 34, pp 159-161

1997 Poulter N. Report to Dept. of Land Administration regarding The rockfall in Weebubbie Cave 6N2 October 9, 1996, Speleological Research Group Western Australia Inc, pp 1-16

1997 Poulter N. Nullarbor Expedition Dec. 26 1996–Jan. 12, 1997, Caver's Chronicle Vol. 24 #1, pp 8-11

1997 Poulter N. Weebubbie. A report into the Rockfall in Weebubbie Cave 6N-2. 9th October 1996, *Caver's Chronicle* Vol. 24 #1, pp 27-32

2004 Poulter N. Nullarbor. Oct.10-Nov. 8, 2003, Caver's Chronicle Vol.31 #1/2, pp 4-14

2008 Collins N. The Nullarbor Plain – A History, ISBN: 978-0-9580482-3-1

2009 Williamson D. Interim Management Guidelines for the Nullarbor Caves and Selected Karst Features

2016 De Poloni Gian, Woods Meghan Gracetown Remembers horror cliff collapse that claimed nine lives, *ABC News* [September 27, 2016]

2018 McDonough L. Pers. Comm., Customer Service Officer, Landgate

2018 Hadland T Pers. Comm. Snr. Geospatial Officer, Topographic, Names and Addresses, Landgate

2018 Paice C. Pers. Comm., Margaret River resident

2018 Climate Data Daily Rainfall Graph — 9636 — Bureau of Meteorology Online Archival, September 1996

#### OTHER SOURCES

Lands & Surveys Department Roads & Reserves, Weebubbie Cave. File #5431/00 Roads & Reserves, File #741/63

Battye Library Proceedings of Parliament, 1st Session 4th Parliament 1901-02/3. Report on Preliminary Examination of Country between Kalgoorlie and Eucla. John Muir

#### **ACCESS NOTES for Weebubbie Cave**

Applications in writing or email for permission to visit or dive at least **4 weeks** in advance of trip to:

Ms Shannon Alford Department of Planning, Lands & Heritage PO Box 1143, West Perth WA 6872 Phone: (08) 6552 4661 Fax: (08) 6552 4417 Email Shannon.Alford@dplh.wa.gov.au

A site indemnity form must be filled out for **each visit** to the site. Forms can be downloaded from the website. Diving permission acknowledged by official letter from Land Owner

#### ACKNOWLEDGEMENTS

In relation to my earlier articles on this subject over the last 22 years, I wish to thank the following people for supplying additional information or corrections to this updated version.

Some information from earlier articles/reports has not been included.

Dr John Watson, CALM Regional Manager - retired

Dr Nicholas White, ASF

Carolina Paice, Margaret River Resident

Lewis McDonough, Customer Service Officer, Landgate

Therese Hadland, Senior Geospacatial Officer, Topographic, Names And Addresses, Landgate

Tony Culberg OAM

Brian Combley

I extend special thanks to Nigel Collins for permission to extract information on the Nullarbor's early history from his excellent book, *The Nullarbor Plain — A History*. It's a great read.

Norman Poulter оам, December 2018