

THE DEVELOPMENT OF CATHEDRAL CAVE, NARACOORTE, AS A SHOW CAVE

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Abstract

Cathedral Cave at Naracoorte was presumably discovered around 1845 when the discovery of Blanche Cave is documented. It was inaccessible for all but the hardest of adventurers with the cave entrance being an 11 metre pitch. Sometime after the turn of the 19th Century a wooden tower was constructed that allowed open access for all visitors. It appears that some guided tours were run for a time, but mostly it was come and go as you please.

For a long period of time the cave was subject to vandalism, with speleothems broken and souvenired, walls adorned with graffiti, both candle smoke and engraved, and the floor of the “Cathedral Chamber” littered with stones, rubbish and glass thrown from above by those curious to hear how deep the cave was. Apart from this, the neighbouring pine forest was depriving the cave of a significant amount of water.

An opportunity to again present this cave as a show cave arose in 2000 with the construction of a steel tower of ladders in the cave primarily as a safe access for researchers.

This paper covers the graffiti removal, clean up of the entrance chamber, the rehabilitation of the cave after the pine tree removal, the construction of an access suitable for the visiting public and ultimately the opening of the cave for guided torch light tours.

INTRODUCTION

Naracoorte Caves National Park has a long history of show cave tours, dating back to the discovery of Blanche Cave (then named Big Cave or Mosquito Plains Cave), in 1845. Private enterprise was alive and well, with guided tours offered by several local entrepreneurs. Individuals, such as Mark Reed and Charles Davies, ferried visitors from Naracoorte to the caves and conducted tours with Magnesium Lamps (Hamilton-Smith, pers. comm.). By the time Alexandra Cave was discovered in 1908, Naracoorte had eight caves open to the public.

Interest in some of the caves waned over time with guided tours eventually restricted to Alexandra Cave and Victoria Cave. Blanche Cave was occasionally guided, but was mostly open for all to visit. The discovery of the Fossil Chamber in the Victoria Cave in 1969 led to more of this cave being opened for visitors and a name change to Victoria Fossil Cave. In 1994 Stick-Tomato Cave was opened as a self guided cave, returning to its former name of Wet Cave. The history of the park was to change forever when it was inscribed on the World Heritage list in 1994 as one of two ‘Australian Fossil Mammal Sites’.

The Bat Cave Teleview Centre, which opened in 1995, provided an innovative and unique method for presenting bats to the public. The opening of the Wonambi Fossil Centre in 1998 further extended the range of experiences offered at the Naracoorte Caves, presenting a high tech interpretation of knowledge gleaned from the fossil deposits. By this time, visitors could take tours to see the Alexandra Cave, Victoria Fossil Cave, Blanche Cave, the Bat Centre, and self-guided walks through Wet Cave and the Wonambi Fossil Centre.

Most recently, the development of Cathedral Cave as a show cave has further expanded the range of experiences offered at the Naracoorte Caves. The construction of a steel tower of ladders in the cave presented a chance to offer another experience for visitors and work over a two-year period has led to the introduction of the Cathedral Cave torchlight tour. Many things needed to be considered when the decision was made to offer the cave as a guided tour. The cave is part of the World Heritage Area and has a large fossil deposit and other potentially fossil bearing sediments, it is a bat wintering site, has a diverse invertebrate population and a long cultural history. This paper covers the early history of Cathedral Cave, its natural and cultural significance and details the restoration and development work undertaken to present Cathedral Cave as a show cave.

HISTORICAL AND SCIENTIFIC BACKGROUND

History

Cathedral Cave was one of a series of caves discovered at Naracoorte around 1845. Early reports of the Naracoorte Caves focussed on Blanche Cave and the story of the petrified Aborigine found within it, although a few interesting accounts of Cathedral Cave were recorded. Naturalist and Catholic priest Rev. Julian Tenison-Woods provided a very different view of Blanche Cave to what we see now. He described this cave as a “wondrous beauty of nature”, yet Cathedral Cave “possesses little that is interesting” (Woods, 1862). At the time of his account though, Woods hadn’t plucked up the courage to enter this “exceedingly deep cave” (Woods, 1862). The fact that Cathedral Cave has an 11 metre pitch through either of two entrances meant that it was largely inaccessible to most of the cave’s visitors, and was only explored by the hardest of adventurers.

Ebenezer Ward (1869) lamented over early damage to the cave:

“There is one circumstance in connection with these caves that is very much to be deplored. All the choicest stalactites have been chipped to virtual destruction for the sake of specimens to be taken away, and there is scarcely a perfect petrification (sic) to be found. But as the process of exudation and congealing is constantly going on, the present defects would be largely remedied in time if further spoliation were prohibited. By-and-bye, as the population increases around Naracoorte, and the attractions of the caves become more widely known, it may be worth while to declare a reserve and appoint a keeper who might supplement his income by levying a small charge for acting as a guide to visitors”.

Although we look back in horror at the souveniring of the day, we must make some allowance for the lack of knowledge and understanding of cave environments and karst processes. Blanche Cave, also suffered at the hands of visitors. Candle smoke, engraved and pencil inscriptions as well as souveniring were taking place to such an extent that by 1868 the locals petitioned the government of the day to appoint a caretaker (The South Australian Advertiser, March 4 1868). The process of protection for the caves was not a speedy one and the first caretaker, Daniel Battams, arrived in 1885. He only lasted one year and was succeeded by William Redden who was caretaker for a period of 33 years. Redden was a particularly energetic man with a passion for caves, and along with Robert Leitch, had the greatest impact on the caves area. Many changes took place during his time, including the discovery of a further ten caves (Hamilton-Smith, pers. comm.).

A wooden tower was erected in Cathedral Cave, during either Redden's or Leitch's time (Hamilton-Smith, pers. comm.). The tower allowed access for all and led to an escalation in graffiti, that only really slowed after the top section of the tower collapsed around 1980. The cave was used as a show cave on some occasions, but most often it was open for all to see.

The earliest tours were run by local guides employing some interesting techniques for getting their visitors into the cave. Mostly, patrons were lowered to the floor (12m below the surface) by rope. A visit by Governor Sir Dominic Daly and other dignitaries in 1863 nearly ended in disaster (Fletcher, W. R. Adelaide Observer 3 May 1879). The idea of lowering the Governor to the bottom while sitting on a chair tied to a rope was poorly implemented. Tragedy was only averted when an onlooker realised the top rail of the chair would not sustain the Governor's weight and modifications were necessary (Fletcher, W. R. Adelaide Observer 3 May 1879). With the modifications made, the party completed their visit safely.

For a short time in the 1990's the National Parks and Wildlife Service ran adventure tours through Cathedral Cave but due to safety regulations regarding rope skills, these tours were cancelled in 1995. Despite visitation for over 150 years, Cathedral Cave had never been part of a structured visitor program.

Vertebrate Palaeontology

During 1958 the first fossils were found in the cave following exploration by CEGSA (Daily, 1960; Reed & Bourne, 2000). In 1974 cavers again extended the known cave, finding a chamber with a large silt deposit of fossils. Although largely ignored due to the presence of the enormous Victoria Fossil Cave deposits, work by Steve Brown in 1998 brought a palaeontological focus back to the cave when he excavated several articulated and partially articulated specimens of Pleistocene megafauna, including the most complete skeleton to date of the small extinct leaf-eating kangaroo *Simosthenurus gilli* (Brown, 1998; Brown & Wells, 2000).

The Cathedral Cave deposit is one of several dated deposits at Naracoorte (Reed & Bourne, 2000). Uranium series dating work by Ayliffe and colleagues (Ayliffe & Veeh, 1988; Ayliffe *et al.*, 1998; Moriarty *et al.*, 2000) suggests these bones accumulated between 279,000 and 159,000 years ago. The focus of palaeontological research has moved away from pure collection of specimens to a more multi-disciplinary approach concerned more with reconstructing past communities and environments as whole systems. A critical part of this is attempting to place faunas in a time-stratigraphic context (Reed & Bourne, 2000). Secondary cave deposits are exceptionally good climatic and environmental indicators and can be accurately dated using absolute dating methods.

The Cathedral Cave deposit is one of 19 found so far within the World Heritage Area, and forms an integral part of Naracoorte Caves' fossil story (Reed & Bourne, 2000). The protection of the fossil areas has been a priority with an already existing 1.5 metre high locked fence around the entrance to the cave, and recently the installation of a gate at the top of the tower. There are plans to place an internal gate at a constriction near the large fossil deposit to exclude unauthorised visitors.

The Vertebrates

Cathedral Cave is an important habitat for the southern population of the Bentwing bat. This population of the species has been described recently as a distinct sub-species, *Miniopterus schreibersii basanii* with a distribution range from the South East of South Australia to Western Victoria (Cardinal & Christidis, 2000). There are only two known maternity sites for this sub-species, the Bat Cave at Naracoorte and Starlight Chamber at Warrnambool. Cathedral Cave is an overwintering site and also appears to serve as a staging cave for the bats when they are returning to the Bat Cave each spring. Many thousands of bats have been observed there in autumn with numbers tending to dwindle into the heart of winter.

The bats' presence adds a further dimension to the Cathedral Cave tour, but will need to be carefully monitored to ensure there is minimal disturbance. Wintering caves are the vulnerable link in the long-term survival of Bentwing bats (Reardon, 1999). Many wintering caves are on private land and are accessed by recreational cavers, with few caves on protected National Parks and Wildlife Service land. The presence

of a large population of bats during winter may see the cessation of public tours for a period of time.

The tour is promoted as an 'eco-friendly' tour, so the cancellation of tours for a period of time should not be viewed as a negative, but rather as responsible management of the resource. It will further strengthen the conservation issues that are discussed on tour with visitors.

The Invertebrates

The little things we can't see are an important part of a cave ecosystem. Cave invertebrates are receiving more study than ever before (Hamilton-Smith & Eberhard, 2000), with Naracoorte Caves' invertebrates under investigation by Adelaide University student Judy Bellati. Cathedral Cave is being used as a control for her study into the status of the invertebrate population in Bat Cave at Naracoorte. Part of her project involves trapping using pitfall traps, sticky traps for flying insects and visual searching of floors and walls. Species identified to date include two endemic to the area, a pseudoscorpion (*Protochelifer naracoortensis*) and a cave cricket (*Novotettix naracoortensis*) (Bellati pers. comm. 2001)

There had never been a defined pathway through the cave so the entire floor had been compacted. This severely impacts on the suitability of the compacted floor area for cave invertebrates (Hamilton-Smith & Eberhard, 2000). Defining a pathway was not only important from an aesthetic point of view for the cave, but critical to preserve and restore cave invertebrate habitat.

Abseiling through the second opening of the cave and access to the sediment cone in the daylight zone have now been disallowed and as a result algae and even small ferns are regenerating. This will provide further invertebrate habitat.

Graffiti

Much has been written about 'speleograffiti' and its historical value, so some thought needed to be given to how and what we should remove (Bonwick & Ellis, 1985; Clarke, 1999). Graffiti, perhaps best described as historical inscriptions, can reveal the time of discovery of caves and their early cultural significance. Sometimes these inscriptions are the only source of information regarding early events or occasions, or are by now-famous people e.g.: Brett Whitely's name and a sketch of a face in Elder Cave, Jenolan (Whyte, 1997).

Cathedral Cave was well adorned with pencil inscriptions, candle smoke and etchings that didn't really contribute to an understanding of the cave's early use. The fact that the initials of Burford and Mason, ardent cave explorers of their time, cannot be found is strange as they have appeared in virtually every other cave on the Park – usually dated 1908 or 1909. This even includes Cable Cave (SU125) which was only 'discovered' in 1981!

THE RETURN OF CATHEDRAL CAVE AS A SHOW CAVE

Presenting the Cave as a Cave

Many factors need to be considered during the development of a cave as a show cave, including the environmental impacts, safety factors, profitability and perhaps the most important question, why do it at all? All of these factors need to be considered before any work can commence. Holland (1995) presented conundrums in show cave development in a paper that demonstrated just how many aspects there are to consider and how show cave development often involves many compromises.

Chew (2000) takes a rather cynical look at the Kartchner Cavern (USA) development in his paper 'when is a cave not a cave?'. It is a must read essay for any manager proposing a new cave development. His most important message is to retain as much of the cave atmosphere or 'feel' as possible, and to not lose sight of what a cave actually is. A really good cave tour will not only be visually exciting, but stimulate other senses, emotions and provoke interest.

Many caves that have been developed as show caves have had to be altered dramatically for ease of access. Some caves have had their whole environment altered through entrance modifications, although an effort has been made in some systems to attempt to retain a 'natural' balance with air-lock doors e.g.: Jewel Cave in Western Australia, Temple of Baal and Orient Caves at Jenolan in New South Wales.

Almost every show cave has some part of its floor stabilised, mostly with concrete, although timber platforms and some recycled plastics are now used e.g.: Ngilgi Cave in Yallingup Western Australia. A rarity among Australia's show caves is Naracoorte's Alexandra Cave, which still mostly retains a natural silt floor, albeit dug out in some areas to make more of the cave easily accessible for visitors.

Handrails, guard rails and other barricades of a multitude of different materials are used to define walking areas to conserve the cave, but sometimes causing significant damage during the installation process (Bonwick & Ellis, 1985). The problem with all infrastructure is the ease of removal is not considered during installation for that time in the future when a better idea or management strategy emerges (Bonwick & Ellis, 1985). During the Cathedral Cave development a determined effort was made to retain a natural 'feel' and not introduce any infrastructure for pathways, yet still provide a clearly defined walkway.

When the Cathedral Cave development started, staff set out with the aim to present the cave as a cave, keep the infrastructure to a minimum and offer an experience that complements other tours at Naracoorte.

The Tower

Recent palaeontological research by Flinders University, and the likelihood of ongoing research necessitated a safer, more permanent means of access to the cave to be

provided. Engineers were consulted to explore options for this to be achieved, their brief was to design a tower that complied with safety regulations, and that the cave wouldn't be altered to make the tower fit. The new steel tower was to be lowered in and bolted together in situ. This method of construction minimised the amount of cutting required and eliminated the need for welding to take place inside the cave. If for some reason in the future the tower needed to be removed, it could be quite readily dismantled and taken from the cave.

The remnants of the old wooden tower were removed and a concrete platform installed. There was no other option that could be considered as the floor is largely unconsolidated and could not possibly support the new tower. The resultant tower is an imposing structure, but tucked away in the northern end of the cave it is not a dominating feature.

Restoration

Cathedral Cave has two entrances about 30 metres apart and around 11 metres deep. Over 150 years of white settlement had seen the entrance chamber become littered with rocks, sticks, broken glass and anything else that could be thrown in. Across the surface today there is not a stone to be found for a great distance around the cave. No doubt the mysterious, inaccessible depths held much fascination for many who couldn't venture into the cave and dropping various objects into the darkness would have kept many young boys amused for hours.

Rather than attempt to remove all the rocks from the cave (many, many, tonnes), it was decided to move them to the northern entrance, where the access tower is, to create a natural looking scree slope. Many buckets full of broken glass were removed as were branches, pine cones and old posts. The entire first chamber, an area of 500m², was swept with a small brush, however glass removal is an ongoing project, as it constantly rises to the surface.

Naracoorte's cave presenters began a project in November 2000 to remove graffiti from some sections of the cave and work towards the final aim of opening the cave to visitors. The entrance chamber of Cathedral Cave is naturally lit through the two entrances which has allowed algae, moss and ferns to flourish. Unfortunately, most of the walls of this chamber had been extensively adorned with engraved graffiti, much of which is quite deep. To remove it would significantly damage the algal and plant life. A decision was made not to remove the graffiti in this first chamber and to conserve the wonderful green walls. In time, nature should take over and the algae and moss should gradually cover most evidence of damage.

In the dark zone, the majority of graffiti was caused by candle smoke. Most of this was easily removed using leather gloves and stiff bristled brushes. Where the walls were a little harder, wire brushes were used and rubbed over with the gloves to smooth the wall off.

It was during this stage an important lesson in conservation was learned regarding the smaller cave inhabitants. Imagine the horror of our invertebrate

researcher Judy when the walls that were so diligently scrubbed of graffiti were now devoid of life! Fortunately, the graffiti was patchy and many invertebrates survived and it did add another dimension to Judy's work as she was able to observe how quickly some species recolonise a disturbed area. The spiders that inhabited the rockpile were also disrupted when some rocks were placed to provide a stepped access from the tower to the floor of the chamber. These spiders are now moving back to the previously disturbed area. However well-meaning cave restoration is, it is always a 'juggling act' between impacts and benefits.

Some areas of the cave had been severely impacted upon by recreational caving with flowstone floors, and in one case rim pools, buried beneath several centimetres of clay. A tank was set up on the surface and filled with bore water and hoses run through the cave (about 120 metres), to aid with the cleaning of these features. Naracoorte has precious little cave water so this was unfortunately not an option to use. A natural depression in the floor was used to hold the run-off water and mud. As this only had a limited capacity, the cleaning of this feature was carried out in several stages. Cleaning revealed creamy-white flowstone with deep rim pools and a tiny fossilised jaw of a small kangaroo embedded in the calcite. This area is now tracked off and can be easily avoided if the rest of the cave is to be accessed.

Regeneration

Much of the land surface over Cathedral Cave had been planted with introduced species, most significantly, pine trees (*Pinus radiata*). It appears this was having a negative effect on the amount of water seeping into the cave and to the amount of calcite deposition (Hamilton-Smith & Eberhard, 2000). The cave now has many areas of new growth appearing on the floor and previously dormant speleothems are once again active. A project by Spot and Jude Matthews now photo monitors various points throughout the cave. It is proposed this will be a ten year project but hopefully there will be enough enthusiasm to keep it running for much longer. A photographic record that spans a very long period of time would form a most interesting and valuable collection.

The cave tour

During the clean-up process, many options were discussed as to the type of tour conducted in the cave. Permanent lighting was an option, but apart from the cost, would not add to the experiences currently offered at Naracoorte. The cave lends itself to adventure tours which would expand the number of caves offered under this part of the program, but not the range of experiences.

The concept of the torchlight tour is not a new idea, but was chosen as it expands on the current range of options. The tour targets those who appreciate caves and enjoy a relaxed, informative and personal tour. Maximum group size was set at ten and tour duration at 90 minutes, to allow plenty of time to move the group up and down 11 metres of ladders. Price was set at \$15 for adults and \$12 for concession and children. Due to the need for visitors to descend the ladders to visit the cave, a

minimum age of 12 was introduced. Some care needed to be taken to ensure those who purchased tickets were physically able to scale the ladders.

Training

A one-day workshop was conducted with the cave presenters to discuss issues related to taking tours through the cave. These included safety procedures, the tour route, topics for discussion, cave science and the fossil history of the cave. Cave presenters were guided to the excavation sites in the fossil chamber by palaeontologists who explained previous and current research. Even though this chamber is not part of the tour, the trip helped further understanding of the site's significance. Much was left to the guides to develop their own tour from the topics discussed, and their own personal experiences in the clean-up process.

Success or failure?

The tours began officially on 26 December and were programmed for 11.00am and 2.00pm daily. On 27 December there were 29 visitors booked by 11.00am and an extra tour was programmed to cater for the numbers. From this early peak interest tapered slightly with most tours only taking 2-4 people, although the tour was quite well received by all those who participated.

Part way through the holiday period the duration of the tour was cut back to 60 minutes, as the guides felt they were struggling to fill in the time, and by reducing the tour duration (and price) it would make for a better experience. The price became \$12.00 adult and \$10.00 concession/child. One tour a day was run for the rest of

the holidays averaging about 4 people per tour. At this stage Cathedral Cave will only be offered on weekends and also through school holidays. Bookings will be taken at other times for a minimum of 4 people to ensure it remains a cost-effective tour.

SUMMARY

The Cathedral Cave tour expands the range of experiences offered at Naracoorte. It is most often purchased by the genuine cave enthusiast, who has taken several other tours and more than likely visited other cave systems. It could well be termed a 'cave appreciation' tour reflecting on past use (and misuse), cave and karst values, and the restoration and preservation of these values.

The involvement of cave presenters was particularly worthwhile, giving them not only a new product to deliver, but an insight into the issues involved in managing and developing caves.

The first holiday period saw the tour run at a marginally better than break-even situation, achieved with very little promotion. The maximum group size means the tour will never be a runaway financial success, but success should not only be measured financially. Cathedral Cave tour was not devised as a huge money-making venture, but to take advantage of the access created primarily for fossil researchers and create a tour for the visitor who is looking for a slightly different experience. If the participating visitors enjoy the tour and leave with a greater understanding of caves, the cave's inhabitants, fossils and the human impacts upon these, the project will be regarded as successful.

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