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FRONT COVER: Grant Gartrell in Cathedral Cave, Naracoorte
INSIDE BACK COVER: Scenes from Andy Spate and Kirsty Dixon, May 2015 ACKMA Conference, Naracoorte
BACK COVER: Conference photo, May 2015 ACKMA Conference, Naracoorte
Photos: Steve Bourne

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IN THIS ISSUE

FROM THE EDITOR

The above sequence was taken by John Brush during the pre conference caving trip in Naracoorte. I took a small group to a cave in the Council-owned quarry, only to discover it had collapsed and entry was not possible. I guess bulldozers and caves don't mix. We spent some time looking for marine fossils, and being short of tools, I resorted to traditional means of breaking rocks.

The 21st Conference on Cave and Karst Management was held in Naracoorte from 10-15 May 2015. It was a very full week enjoyed by a smaller group of delegates than had attended the previous few conferences, but nevertheless enjoyed by all attendees. A report on the conference appears in this journal.

The biggest news in caving this year was the passing of Prof Elery Hamilton-Smith on 27 June 2015. Many tributes flowed in the days following the announcement. I was able to attend the service held in Melbourne, travelling over with Brian Clark and Cath Loder. Quite a few ACKMA people made the trip. The diversity of the crowd present reflected the breadth of Elery's expertise and interests, with the eulogy presented by Dennis Williamson comprehensively covering Elery's life. I think everyone present learnt a little more about the man. The September edition of the journal will be dedicated to Elery, and include the eulogy, tributes and information I have been provided and able to gather. Please feel free to send more information and images for this edition. It is fitting that the 100th ACKMA journal remembers a man who did so much for caves, karst and ACKMA itself.

This journal includes two papers presented at the conference. Cathie Plowman discusses the issue of coins in caves and Sasa Kennedy explores the power of connection to a site.

I was very pleased to be contacted by Luiz Travassos from Brazil, offering a paper on geotourism and geoconservation in that country. This second offering from his university is most welcome - perhaps Brazil is an option for a future ACKMA event? Kent Henderson provided a paper on Capricorn Caves, perfectly timed to whet members' appetites for the 2016 AGM.

About two years ago, I was emailed by Ralph Crane seeking cave images for a book. Usual story, educational book, no money for images. I obliged with a disc of images and had actually forgotten all about it when Ralph emailed asking for my postal address to send me a copy in return for the images used. Greg Middleton obtained an early copy and has provided an extensive review.

Coming Events	
2016: May	**ACKMA Annual General Meeting and Cave Guides Workshop, Rockhampton, Queensland**
2017: May	**ACKMA Annual General Meeting, Auckland (tentative)**
2017: 23-30 July	International Union of Speleology Congress, Penrith, NSW, Australia
2018: May	**ACKMA Biannual Conference, Wombeyan Caves, New South Wales (tentative)**
	Do you know of an event that may interest ACKMA members? Please send to publications@ackma.org

PRESIDENT'S REPORT

Dan Cove

A presidential opening: Dan Cove at ACKMA 2015
Photo: Steve Bourne

It is, of course, impossible to commence this report with anything other than the recent passing of Elery Hamilton-Smith. I will not write about Elery at any length at this time. The next edition of the ACKMA journal, fittingly the auspicious edition 100, will fittingly celebrate the life and achievements of the 'father of ACKMA'. For now, I shall simply sum up the innumerable tributes that have been flowing in to say that if we are all the sadder for the loss of Elery, it is simply because we were all of us made so much the richer for having known him just as the world itself is the richer for his life and his legacy. Vale.

It was a pleasure for me to have attended the recent ACKMA Conference at Naracoorte. The gathering of the ACKMA family is always a special time, and a time for the pleasure of renewing friendships as well as attending to the serious and consequential matters of the Association. Naracoorte 2015 was no exception, with a particularly fine balance of field trips and an engaging speakers' program. The smooth running of the conference was a great tribute to the organising committee led by Deborah Carden and including Steve Bourne, Amy Macken, Ken Grimes, Grant Gartrell and Ian Lewis. There were many highlights of the conference, but perhaps none to top the beautiful surprise wedding of Andy and Kirsty – a moment that will never be forgotten by those of us fortunate enough to be present in Blanche Cave. There was also a great deal of serious Association business, with the new Rules being accepted by the membership and with the formation of the new ACKMA committee. I was honoured to be renominated as President, and to be able to continue to work with the fine group that makes up the Executive.

It was a timely and productive exercise to have engaged in the level of debate and discussion throughout the week of the conference regarding the core purposes and challenges faced by the Association. It is firmly my belief that all professional associations should not be afraid of introspection and critical examination, as reluctance to consider a problem leads to stagnation and ultimately decline. Behind the healthy debate there was certainly a clear agreement that ACKMA remains a necessary and relevant body, albeit one that faces challenges of communication, focus and how best to offer advocacy and support. These challenges, and the suggestions made during the conference, will be taken up and worked through by the incoming Executive Committee.

The next 12 months will also see the Executive continue to address some elements of structural and operational reform to ACKMA, with a continuing review of membership costs and benefits and ongoing work on the new membership database system. The Association remains in a sound financial position, a credit to the work of Treasurer Grant Gartrell, but the Executive has committed to taking a more strategic approach to the financial future with a budget review and implementation of more structured processes for allocating financial resources. This review process will provide a clearer foundation upon which the Association can make future decisions and move forward.

Finally, I would like to congratulate Ann Augusteyn and the fabulous team at Capricorn Caves who celebrated a Bronze Award at the Qantas Australian Tourism Awards earlier this year. I can attest from personal experience that these awards are intensely competitive and the process of becoming a finalist is long and demanding. Only tourist attractions that meet the very highest standards and that have genuinely demonstrated excellence and innovation well above the average compete at so high a level, and to win a Bronze Award is a remarkable achievement. It is always wonderful to see show caves being featured prominently on the national tourism landscape, and all credit goes to Capricorn Caves for taking centre stage in 2015. I am already excited at the prospect of seeing first hand the many changes and improvements at the site during the 2016 AGM weekend.

COINS in CAVE POOLS: IS it a PROBLEM? SHOULD it be MANAGED?

Cathie Plowman

Abstract

Throwing coins into pools of water for good luck, having a wish granted, to receive a religious blessing and as a charity fundraiser, is a widespread practice across many cultures. Sites where this regularly occurs includes pools in gardens, fountains, memorial pools and caves. While this practice historically occurred at several show cave sites in Australia and New Zealand it has largely ceased in these two countries due to management actions. However, the practice of throwing coins into pools of water is widespread in many other countries including the United States of America and many Asian and European countries. This paper will raise and consider some issues regarding the practice of throwing coins into pools in caves, including why people do it, are there issues for cave conservation and management, should the practice be managed and is more study required re this issue. This paper specifically seeks to raise discussion on this issue, rather than to criticise the practice. Therefore, except for some historical examples, specific caves will not be mentioned in this paper and photos showing examples of coins thrown in caves will not include the name of the cave.

Coins in Cave Pools

Coins being tossed into pools of water is a widespread and long-standing human practice. We see it regularly: in pools in gardens and natural areas, in fountains, memorial pools and gardens, in front of religious statues. Coins being thrown into cave pools has traditionally occurred in Asia, many parts of Europe, North America, South America, New Zealand and Australia.

This short paper will consider:

- Why people might throw coins into water?
- Should the practice be managed in caves?
- Is more study required on this issue?
- Issues regarding what happens to the coins.

This paper does not set out to criticise any current practice occurring in caves but to raise some questions and promote discussion.

Why do people throw coins into pools?

The author has not been able to locate any detailed research on this practice. The varied reasons commonly given for throwing coins include:

- Receiving good luck.
- Having a wish granted.
- Receiving a religions blessing.
- Following the lead set by others.
- Fun or challenge to have a coin land in a given place.
- A traditional fund raiser, and there are many impressive examples of this in relation to wishing wells in caves.

Are there issues with coins in caves?

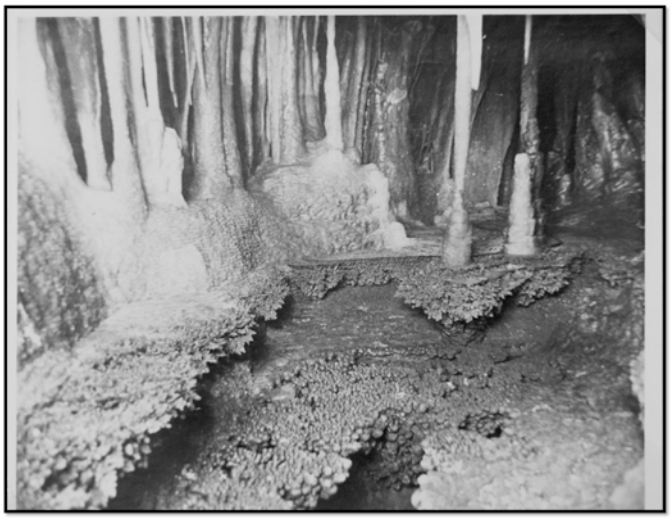
The research is limited but coins do change the natural appearance of the places where they are thrown. This may be a stream or pool, mud walls or ceilings. Blue-green staining from coins in common. Water chemistry can be altered and there can be changes to aquatic life. The pool and its surrounds may also be damaged if the coins are collected.

Thrown coins also change the aesthetics of caves. However, beauty is in the eye of the beholder and while some may find changes to the natural appearance distressing, others may find the blue-green stains left by coins add to the beauty of the cave.

Following are three examples from Australasian show caves where 'wishing wells' have caused alterations to the cave appearance and ecology.

Example 1: Jillabenan Cave at Yarrangobilly Caves in New South Wales.

This cave was opened as a show cave in 1914. At some stage a pool known as the Bath of Venus was modified and became a wishing well. In approximately 1967, the caves were closed to be redeveloped as part of a prisoner workforce project, and were reopened in approximately 1970. Since then the pool has not been promoted as a wishing well and any 'tossed' coins have been retrieved by staff. However today, more than 45 years after the pool was last used as a wishing well, the blue-green stains from past coins remain.



Bath of Venus prior to 1928. The photographer is unknown. John Brush re-photographed this photo which is now part of the historic collection at Yarrangobilly Caves.

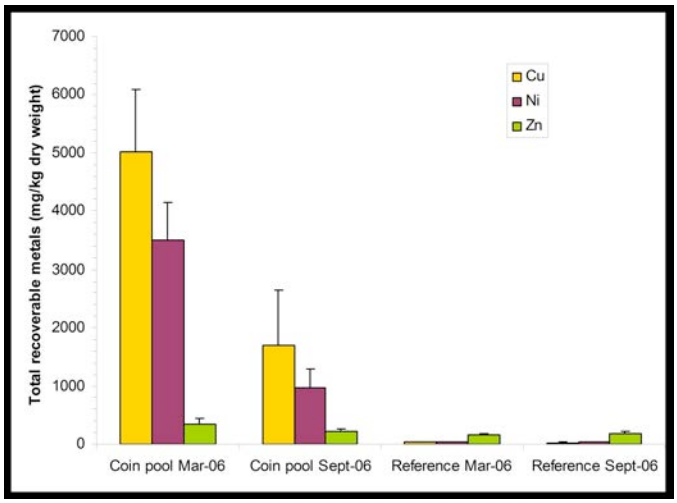
Below. The Bath of Venus in 2014. The blue-green stains from past coins remain more than 45 years since the pool was used as a wishing well. The 'splotches' in the pool are shadows cast by the calcite rafts which have now formed on the surface of the pool.

This photograph was taken by Leo Hoad in 1928 and was part of a postcard series. It too has been re-photographed by John Brush. The photo shows that the floor of the pool has been altered and raised and the pool is now being used as a wishing well.

Example 2: Aranui Cave, Waitomo, New Zealand

Dr Mike Scarsbrook and colleagues did some water sampling in the cave in March 2006. Samples were collected at the wishing well site and at a reference location elsewhere in the cave. Copper and nickel (prominent in New Zealand coins) were significantly higher at the wishing well site than at the reference site. All coins were removed from the wishing well in April 2006 (1.7 kg dry weight). At that time a fauna survey showed only microbial fauna at the wishing well site with lower biodiversity than at the reference site.

Further water samples were collected from the two sites in September 2006 and the copper and nickel content at the wishing well site had dropped since the March sampling. The reference site measurements had not altered.



Recoverable metals, Aranui Cave. Illustration by Mike Scarsbook and provided by Andy Spate

Example 3: Jenolan Caves, New South Wales

At Jenolan Caves money was traditionally collected in two caves at sites known as hospital boxes and distributed to the hospitals at Lithgow and Bathurst. In 1910 alone £66 was collected from these 'boxes'. A significant amount of money for the time and an example of the long-standing relationship between 'wishing wells' and charity fundraising.

Former hospital box in the Mafeking Chamber, Jenolan Caves. It is uncertain when the practice of coin collection here was ceased but the blue-green colour remains today. Photo: Sasa Kennedy.

Above left. Coins collected from a 'hospital box' at Jenolan Caves. Photo: Julia James.

Above right. Scoop used historically to collect coins from the hospital boxes at Jenolan Caves. Photo: Sasa Kennedy.

Wishing wells and coin throwing; some international examples.

The following photos show some examples of coins in caves from different international sites. The specific sites will not be named as the intention is to raise discussion on the practice rather than focus on individual cave sites.

Wishing well in cave in Korea. Photo: Andy Spate.

Right top. Coins in a cave pool in Europe.

Right bottom. Close-up of the pool floor. Photos: Steve Bourne

An ice cave in Europe. While coins are often thrown into a single pool or 'wishing well', in many caves coins are thrown spontaneously so that the coins are scattered in several places in the cave. Should we be concerned about the possible impacts of coins in an ice cave like this when the impacts of climate change are already altering the cave environment?
Photo: Steve Bourne

Wishing well in a cave in Europe.
Photo: John Brush

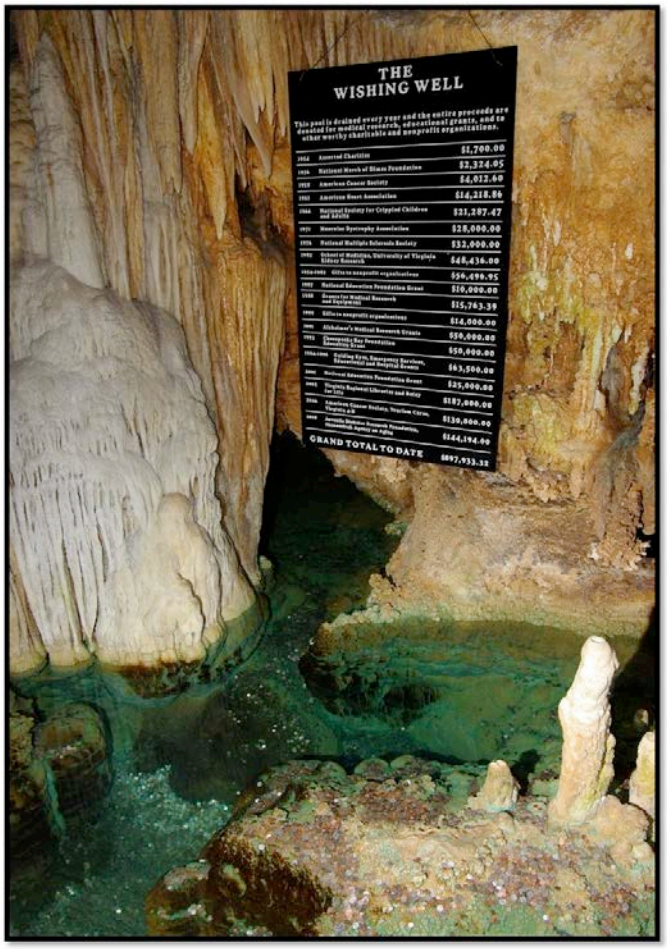
A small pool in a cave in Europe. There are three coins visible in the pool. This small pool included some exquisitely beautiful cave pearls. For the author, the sight of the coins marred the natural beauty of the pool and started her considering the issues of coins in caves.
Photo: John Brush

Cave in Europe.
Photo: John Brush

Cave in the USA. The throwing of coins into the ceiling is encouraged in return for making a wish. The cave owners apparently clean the cave ceiling of coins annually and donate the money to charity.
Photo: John Brush

Cave in the USA. Close up of image previous page. Photo: John Brush

Cave in the USA. Close up of image previous page. Photo: John Brush



This cave in the USA has collected significant amounts of money for charity in this wishing well. The sign summarises the amounts collected from 1954 until 2008. In 1954 $1700 was collected. In 2008, $144 000—a total of $898 000 up to 2008. During discussions when I presented this paper at the International Show Caves Association Conference (ISCA) in 2014, a manager from this cave advised that they have considered closing the wishing well for environmental reasons, but that it is too lucrative for charity. Besides coins, other valuables such as paper money, wedding and engagement rings are regularly thrown into the pool. Comments posted on the internet in relation to this cave show the different responses. Whereas some people find the blue-green colour adds to beauty of the cave, others dislike the damage caused by the wishing well but are full of praise for the charity fund-raising. Photo: John Brush.

Should the practice of coin throwing in caves be managed?

Should we be concerned with this widespread and traditional practice? Do the impacts of coins even matter given the amount of alteration that occurs in a show cave to allow visitations, e.g. lights, paths, railings along with the impacts associated with large volumes of people?

Would more research be helpful? Research could better quantify the impacts of coins on the cave environment but also consider why people throw coins in caves and perhaps look at alternatives that might satisfy the needs of the visitor as well as protecting the cave. Professor Kyung Sik Woo advises that an artificial pool with a statue of the Buddha was placed in a cave in Korea and people confined their coins to this pool rather than elsewhere in the cave.

Does encouraging coins to be thrown in one cave encourage visitors to throw coins in other caves where the cave managers are seeking to discourage the practice? Would an external or stand-alone wishing well be a suitable alternative? This was previously done at Tantanoola Cave in South Australia but perhaps is not as romantic or appealing as a natural-looking pool.

Should the coins be collected? In some places they are, in other places they are deliberately left where they land. Damage can be caused in collecting coins in vulnerable cave locations. In some places when coins have been collected they have had little value due to their degradation. International coins may also have little value and there are costs when converting currencies. The Australian government gives all monies collected from the pools and fountains at Parliament House, Canberra to the international charity UNICEF.

Wishing well previously at Tantanoola Cave, South Australia. This was built by the service club Rotary International. Former cave manager Steve Bourne reports that when the entrance to the cave was being redeveloped he contacted the local branch of Rotary regarding the relocation of the wishing well. No current active members of the club were aware of the wishing well and no one could remember when it had last been cleared of coins. Two 10 litre drums of coins were subsequently collected from the well, but the money had to be discarded due to degradation from being in water for so long. Photo: Steve Bourne

Some additional input

Since presenting this paper at the ISCA conference 2014, the following input on this issue:

Nurul Hidayah from Dark Cave, Malaysia reports that a decision was made not to encourage any coin throwing in the cave and that, any coins are collected as soon as they are noticed. However, as coin throwing is not encouraged, very few coins are actually thrown in the cave. Coin throwing is a common practice at nearby caves.

Allen Mathis from DeSoto Caverns, Alabama USA ,advised that they had recently commenced a wishing well. It has a net-liner in it that can be lifted out once a week so coins do not accumulate in the cave. The money collected is used for a staff support fund to assist staff in times of illness and sudden crisis. Allen added that 'today's wishing well utilises a shallow well dug by Confederate soldiers in 1865 to get water for the process of leaching nitrates from the soil of the cave to make gun powder.' He proudly concluded 'now the well is used to help people not to help kill them.' Al's input widened the author's perspective on the social side of wishing wells. In Australia we have a national health system. No so in many countries, including the USA, and the funds raised in wishing wells can provide significant and necessary financial support.

In conclusion

There is a long history of people throwing coins into pools of water both in and outside of caves and also a long history of money collected in cave wishing wells being donated to charities. But are these traditional practices in tune with current thinking on best practice show cave management? Is it time for further discussion and thinking?

Acknowledgements

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GEOTOURISM and GEOCONSERVATION at the SUMIDOURO STATE PARK, MINAS GERAIS, BRAZIL

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Abstract

Topics such as geodiversity, heritage and geomorphological geosites have been at the centre of debates in different spheres and pointed out as important tools for geoconservation and management of protected areas. In order to strengthen these issues in the region of the Sumidouro State Park (Minas Gerais, Brazil) this paper is intended to highlight some Places of Geomorphological Interest in order to inventory, evaluate and classify them so that they could be valued as important abiotic heritage. The methodology was proposed by Pereira (2006) and adapted to the Portuguese karst by Forte (2008) and by Travassos (2010) for the Brazilian karst consisting of the identification and characterization of geosites with the presence of Places of Geomorphological Interest classified as isolated forms, area and panoramic types. The results allowed the proposal of geotouristic trails seeking the promotion of the geomorphological heritage, as well as the karst features in the region.

Keywords: Geodiversity, Geotourism, Geoconservation, Places of Geomorphological Interest, Sumidouro State Park.

Introduction

It took relatively a long time for the world population to increase the level of awareness regarding natural resources and their usage. After many world meetings and conferences, the main perspective to minimize anthropogenic impacts over nature is being more accepted, although conservationists and scientists think it is still a long "road for success" regarding the conservation of biodiversity and also of the geodiversity.

Therefore the abiotic heritage (e.g.: geology, geomorphology, paleontology, speleology, etc.) has only received more international attention starting in the 90s and in recent decades in Brazil. Even though more is known, the importance of the abiotic heritage (geodiversity) is still small if compared to studies focusing the biotic heritage, or biodiversity.

The concepts of geodiversity and the geological and geomorphological heritage are relatively new and involve the physical elements of the landscape such as rocks, soils and surficial forms. They are now being treated from the perspective of their appreciation and conservation in recognition of their importance for humankind. Such behaviour is associated with the fact that the structure of the Earth's surface, apparently robust, offers a false impression that it is constituted by a set of permanent and durable features (Evangelista & Travassos 2015).

According to Pereira (2010), this impression is false, as one can identify that the whole natural heritage is vulnerable to human action and has exceptional value to humanity, consisting of biotic and abiotic factors which together form the geodiversity. Thus, geodiversity is the result of a long and complex process that began with the creation of the Earth 4.5 billion years ago, considering the age of the sequence of rocks encountered and the evolution of living beings in a relative time scale considering the natural biotic and abiotic heritage.

The concept of heritage makes the connection with something important which is transmitted or passed over generations. According to Choay (2001) this term was used for other purposes covering areas such as genetics, culture and nature and is often used to refer a set of tangible or intangible goods. Pereira (2006) considers heritage as properties that by human perception and in time acquired special values which distinguishes them from other goods. Included in this definition are the geosites and the Places of Geomorphological Interest that stand out over others.

Consequently, facing society's need and dependence of natural resources, Brilha (2005) points out the idea of conserving the geodiversity is not to preserve all existing outcrops, but those which are endowed with a high scientific, cultural, touristic and educational value. One can mention this topic precisely in the centre of the epistemological discussion regarding the geological and geomorphological heritage in order to enhance the geoconservation's field of study.

In this perspective of conserving the abiotic heritage, one can identify the geological heritage, constantly modified by the system's natural dynamics (Ruchkys

2007). According to Pellegrini (2000) conservation promotes active management of natural and cultural objects, giving them at the same time a convenient function with appropriate solutions to the desired progress avoiding or minimizing losses. However, it is known that conservationist practices sometimes does not exclude uses that effectively lead to the destruction of the geological heritage, such as the case of mining activities and also tourism, if poorly planned and managed can generate negative impacts. Therefore, geoconservation is associated to the concept of sustainable use that seeks to reconcile nature's conservation with the sustainable use of part of its natural resources through geotourism.

The field of geotourism was strengthened by the growing number of mines that were being exploited due to socioeconomic growth of English society. In order to identify, protect and conserve its geosites this issue gained more adepts and became constantly updated. For this reason, Hose (2000) felt the need to review his own definition of geotourism as the provision of interpretive tools and services to promote the value and social benefits of places and geological/geomorphological materials in order to ensure its conservation for use by students, tourists and other people with recreational interest or pleasure (Hose 2000 apud Hose 2011a; Hose et al. 2011b).

For these reason, knowing the importance of geotourism for karst conservation, this paper was developed in order to discuss the importance of the geological and geomorphological heritage of the Sumidouro State Park (Minas Gerais, Brazil), and also making an inventory and classification of Places of Geomorphological Interest which could be used for scientific, educational and sightseeing porpoises. The area is located in a region of high level of anthropogenic impacts, and urban expansion is a clear risk for conserving this abiotic heritage.

Methodology

The development of a methodology aimed at the geomorphological heritage arises simultaneously with the demand of valoration occurred in the 90s. It arises especially linked to the value of preserving elements of the natural environment, cultural and historical elements, especially the geological and geomorphological ones. These elements comprise karst regions with different values (e.g.: ecological, economic, scientific, etc.) and have undergone many changes, mainly due to urban sprawl. For Pereira, Pereira and Alves (2007), initiatives directed in the conservation and protection of the geological and geomorphological heritage gained emphasis due to its assessment beyond mere recognition of landforms as a potential touristic or scientific site. Furthermore, this evaluation process provides the comparison in terms of importance between other locations.

The methodology to evaluate the geomorphological heritage presented by Pereira (2006) has two main steps: an inventory that seeks to identify the places of interest and the quantification which gives values in order to better promote proper management of natural resources. The first is understood as a more qualitative step in which the researcher proposes the selection of places and their characterization according to the context in which they have developed. The second step is to quantify, a little performed task by most researchers mainly for not presenting a well-defined criteria. Therefore it is guided by the definition of the intrinsic value of each place, its potential use and the need for protection being as more objective and less ambiguous as possible (Brilha 2005), according to Table 1.

Table 1: Steps and sub steps of the geomorphological heritage evaluation

STEPS	SUB STEPS
Inventory	a. Identification of Places of Geomorphological Interests b. Qualitative evaluation c. Selection of Places of Geomorphological Interests d. Carachterization of Places of Geomorphological Interests
Quantification	a. Numercial evaluation b. Ranking

Source: adapted from Pereira (2006: 94)

In the inventory one should consider the additional values (e.g: ecological, cultural, aesthetic, economic, etc.) contemplated by a holistic view of the area. In this regard, the main highlights were places with high scientific value. Considered in this study as "macrostructures" the geosites presented more of one Place of Geomorphological Interest. Thus, the authors selected 6 main geosites and 10 Places of Geomorphological Interest (Table 2) classified as panoramic, isolated or area.

Study Area

The karst region of Lagoa Santa is located in the south central portion of the state of Minas Gerais about 50 km north of the state capital, Belo Horizonte . The region has a Conservation Unit called Sumidouro State Park, part of

Table 2 – Places of Geomorphological Interest from the Sumidouro State Park

ID	Name of the Place of Geomorphological Interest	Type
P 01	Gruta da Lapinha (Lapinha Cave)	Area
P 02	Mirante da Lapinha (Observation point of Lapinha)	Panoramic
P 03	Lapa do Sumidouro (Sumidouro Cave)	Isolated
P 04	Mirante do Sumidouro (Observation point of the Sumidouro)	Panoramic
P 05	Poljé do Sumidouro (Sumidouro Polje)	Area
P 06	Epicarste da Mineração desativada da Finacal (Epikarst of the Finacal deactivated quarryl)	Area
P 07	Cavernas preenchidas da Mineração desativada da Finacal (Filled caves of the Finacal deactivated quarry)	Area
P 08	Maciço do Baú (Bau Massif)	Area
P 09	Maciço da Fazenda Girassol (Massif of Girassol Farm)	Isolated
P 10	Mirante do Cruzeiro (Observation point of the Cruzeiro)	Panoramic

Source: Evangelista (2013)

the Environmental Protection Area of Lagoa Santa Karst. The Sumidouro State Park comprises the municipalities of Lagoa Santa and Pedro Leopoldo with total area of 2,004 hectares.

The Park was created in 1980 by Decree nº 20.375 in order to preserve the existing cultural and natural heritage of the region (IEF, 2012), even before the creation of the Environmental Protection Area of Lagoa Santa Karst on January 25, 1990 (Decree nº 98.881). With 36,000 hectares (356 km²), the Environmental Protection Area of Lagoa Santa Karst fully contains the Sumidouro State Park, the Cerca Grande State Park, Natural Monuments, and parts of the municipalities of Lagoa Santa, Pedro Leopoldo, Matozinhos, Funilândia, Prudente de Morais, and the entire municipality of Confins (Figure 1).

The sites were compared with each other in order to check their values, such as scientific and educational ones, to use them as Places of Geomorphological Interest. According to Forte (2008), these parameters guide the definition of the places which will be effectively evaluated and classified. Once selected, one starts the detailed characterization of each location. The Places of Geomorphological Interests here were grouped taking into account the geological and geomorphological aspects, cultural heritage, landscape features and possibility for geotouristic itineraries.

GEOLOGICAL AND GEOMORPHOLOGICAL ASPECTS

Located in the middle portion of the Velhas river, the Sumidouro State Park , displays significant karst features such as closed depressions, carbonate outcrops, various types of karren, and poljes amid flatter reliefs of large hills and slopes dissected due to sub horizontal dip of the layers slightly oriented NE and reflecting the regional geomorphological dynamics and the lithological context in which it is inserted (Kohler 1989). In the region one can also observe a succession of carbonate units covered by phyllites and affected by geological and tectonic events that caused ground and surface changes. The combination of these different factors enabled the existence of different morphological units found in the central portion of the state of Minas Gerais.

Among the morphological units and the physiographic sub-compartments found in the karst region of Lagoa Santa, NW- SE direction from the Ferradores ridge, Kohler (1989) highlights the gorges and pits with high walls, aligments or belts of uvalas, the Dolines Plateau, and the plains or karst poljes. Thus, the highlighted region is comprised by the so called karst compartment. Considering the most relevant features of geological and geomorphological point of view, the Sumidouro Polje and the Girassol Farm Massif stands out.

The Sumidouro Polje is located 678 m above sea level in the eastern portion of the Park in Fidalgo, Pedro Leopoldo. It is a scenic spot with good visibility where it is possible to observe all the corrosion plain, the Sumidouro Lake and the hum of the Fidalgo Massif in the Lagoa Santa Plateau, as characterized by Kohler (1989). One can note that the Sumidouro Lake undermines the massif of the same name as the chemical processes take place. For this reason, in the geological time, as the carbonate rocks are weathered, falling blocks occur, and those are found at the massif's base. A magnified view of the geomorphological elements becomes clearer during the dry season when the lake has its water table lowered (Figure 1 and Figure 2).

Figure 1 – Lake formed at the Sumidouro Polje, during rainy season
Photo: B. D. Rodrigues

Figure 2 – Intermittent behaviour of the Sumidouro Polje in extreme drought
Photo: L.E.P. Travassos

The Girassol Farm Massif (Figure 3), is considered to be an isolated place located in an altitude of 708 m, southwest of the Sumidouro State Park. Located on the Dolines Plateau in the same direction of the Lapinha Massif (W-E), it presents the typical karst ruiniform aspect featuring a large doline in its front (Figure 4). This geoform presents a rock shelter, various types of karren, and fallen rock boulders. The predominant vegetation is the dry forest which can lose almost all leaves during the dry season.

Figure 3 – Panoramic view of the Girassol Farm Massif and the dry forest on the top, during wet season
Photo: L.E.P. Travassos

Figure 4 – The doline at the base of the Girassol Farm Massif.
One can also see collapse boulders at the base, as well as speleothems. The researchers are serving as scale in front of the massif and they are approximately 1.80 metres tall.
Photo: L.E.P. Travassos

CULTURAL HERITAGE

According to UNESCO (2012) heritage is the legacy we have received from the past, live in the present and transmit to future generations. Therefore, the cultural and natural heritage is an irreplaceable source of life and inspiration, our identity. But this situation was not always so. Only after the Industrial Revolution that arises the concept of protecting the cultural heritage under the auspices of the governments. In the case of the Sumidouro State Park, it was created in 1980 by the Decree nº 20.375 in order to preserve the existing cultural and natural heritage of the region (IEF, 2012). Thus, this paper highlights the Lapinha Cave and the Observation point of the Cruzeiro.

Although it has geological importance, the Lapinha Cave has a high cultural value. It is located in the southwestern portion of the Park at the Lapinha district (Lagoa Santa), 733 m above sea level. It has 630 m of horizontal development and was discovered in 1835 by the Danish naturalist Peter W. Lund, being opened to visitors in 1965. Located in the region known as the Plateau of Dolines, the cave has its entrance in a rocky wall marked by horizontal karren and a thick layer of soil at some portions with dry forest (Evangelista & Travassos 2011). Some caves in the surroundings have been used a long time for religious practices as historical records shows.

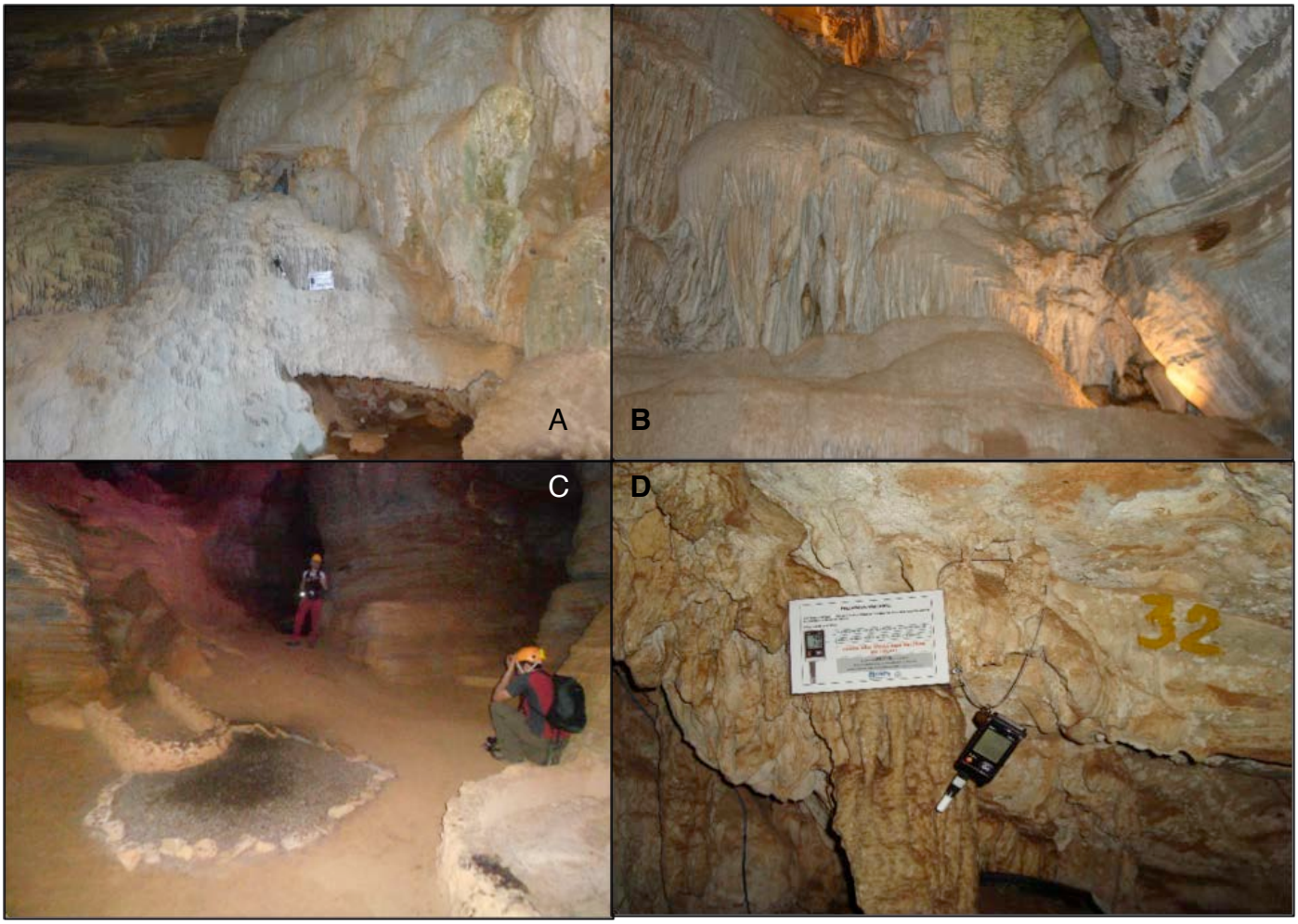


Figure 5 – General aspects of the Lapinha cave.
***A** Image of Our Lady of Aparecida, Patron Saint of Brazil which was put by the local population in the entrance of the cave in the past. **B** Flowstone inside the cave. **C** Guano deposits protected by placed stones in order to avoid trampling by tourists. **D** Temperature and Humidity monitoring from the Project CNPq 479945/2013-6*
Photo: L.E.P. Travassos

The Observation point of the Cruzeiro is located in the central portion of the Park, east of the Lapinha Massif in Lagoa Santa. The observation point is a prime viewing spot for much of the regional geomorphological heritage, composed by the Ferradores ridge and the flattened hilltops of Confins, southwest of the Tancredo Neves International Airport (Figure 4). From this point one can observe the karst depression comprising the Lapinha Lake, the district of Lapinha, the massif of the same name to the west, a set of massive limestone to the southeast and dolines which surround much of the area. Located at one of the highest points of the Sumidouro State Park (773 m), the Observation point of the Cruzeiro has a cross, which for many years attracted religious groups that used to go to the location in order to thank God for the rain after long periods of drought.

LANDSCAPE ASPECTS

The records preserved in rocks and landscapes are unique and surprisingly fragile, so they must be conserved to ensure this heritage for future generations. Brilha (2005) considers observing a natural landscape is something spontaneous and automatic, but compare it to others is debatable, because all landscapes are endowed with some kind of aesthetic value to residents and visitors alike. The socioeconomic and environmental activities are closely associated with the landscape morphology of a given region and thus it is necessary to maintain as far as possible the natural systems. For this study, the Baú Massif and the Observation point of the Sumidouro are considered important Places of Geomorphological Interest.

Figure 6 – Panoramic view of the Observation point of the Cruzeiro
Photo: V.K. Evangelista

The Baú Massif is located 724 metres above sea level in the western portion of the Sumidouro State Park in the district of Fidalgo, Pedro Leopoldo. Although out of the Parks's limits, this site was incorporated into the geomorphological heritage of the Park by its magnitude and its proximity to other abiotic elements that composed the geomorphological unit of the Dolines Plateau. The massif stands out also for its morphological set of more generally convex or elongated hilltops and epikarstic areas with dry forest and dolines (Piló 1998). The massif gets its name because of the elongated shape which resembles a "key" or "lock" of a "chest" or in Portuguese, "Baú" (Figure 7 and Figure 8).

Figure 7 – General overview of the Baú Massif and its doline during the dry season
Photo: L.E.P. Travassos

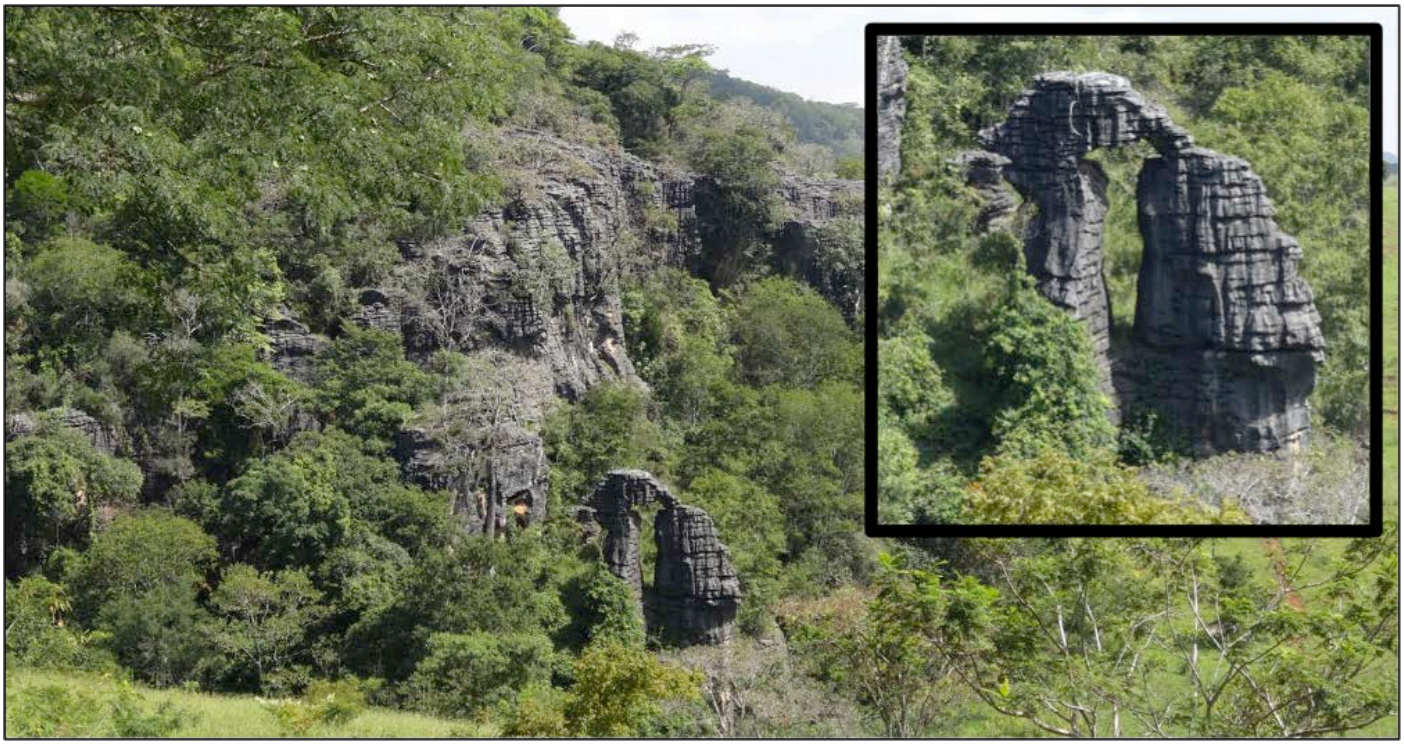


Figure 8 - Panoramic view of the Baú Massif. In the detail one can see the shape in the rock similar to a "key" or the "lock" of a chest, true to the popular imagination in the region

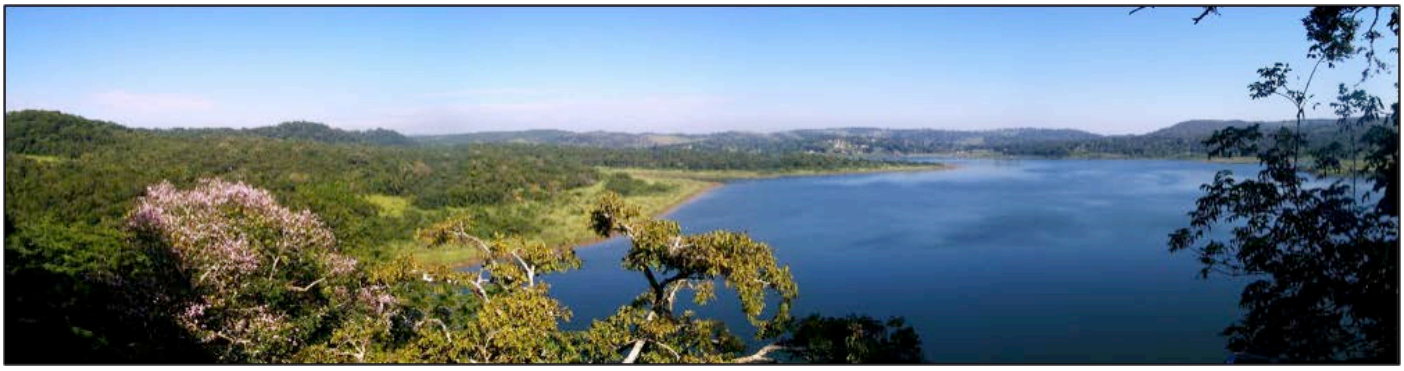


Figure 9 - View of the Sumidouro Lake on the top of its massif during the wet season
Photo: L.E.P. Travassos

Figure 10 - View of the Sumidouro Lake on the top of its massif during the wet season
Photo: R. Tavares, Park Manager

The Observation point of the Sumidouro is located 700 metres above sea level on the Fidalgo/Sumidouro Massif, at Fidalgo, Pedro Leopoldo. It was identified as a scenic spot due to its altitude and the magnificent view of Sumidouro Lake and its floodplain. From this point, one can also observe part of the regional karst dynamics, including the Samambaia creek that feeds the lake.

CONCLUSIONS

The Sumidouro State Park can be considered a privileged area in terms of geodiversity. Located in a sedimentary basin, the park holds a natural heritage of great scientific and cultural significance in the national and international scenario. Its unique geographical position and the variety of notable geomorphological features favored the creation of the Park in the 80s. The regional karst dynamics which led to the elaboration of forms and unique landscapes, today is considered to be a high heritage value. However, it was not always seen that way, as evidenced by the clear interventions suffered, both in limestone exploration itself, and in the unplanned urban and industrial expansion.

Due to the need of protecting the geological and geomorphological heritage of the Park this work was based on methods which evaluate the geosites found in the region, making its inventory and quantification. The methodology used proved to be the most suitable for the study area, because when using quantification one seeks to minimize the subjectivity inherent in the evaluation process by intrinsic values. This method helps to address, more objectively, the relevance of the heritage to be protected and maintained.

In this work the selected sites were considered as places to be preserved as geosites and they are most significant Places of Geomorphological Interest due to the fact they are expressions of the regional karst landscape. After selected and quantified, the sites were classified according to their representation in terms of geological and geomorphological aspects, cultural heritage, landscape features and geotouristic attractiveness.

The proposal of heritage development and promotion of the Sumidouro State Park is intended to enhance and encourage the use of the Park trails as well as the development of educational panels for the panoramic Places of Geomorphological Interest (Figure 12, 13 and 14). Currently the Park has three hiking trails:

a) the Travessia ("Crossing" which connects the Lapinha Cave area to the Sumidouro Lake),

b) the Sumidouro trail (which takes the visitor to the Sumidouro Cave and the limestone massif which is the observation point of) and

c) the surroundings of the Lapinha Cave Massif. One can also suggest a new hiking trail which connects natural aspects and cultural heritage: the Sumidouro Lake – Water mill. This trail features three notable points subject to observation. This route starts at the Sumidouro Lake and ends at the Research Centre of the State Park. One can observe the major karst feature of the lake and its massif, as well as the creek which used to move the water mill in the past. At the beginning of the trail one can observe the polje and the dynamics of the Samambaia creek. In the middle of the route, tourists can observe the magnificence of the karst depression and its hum. Following the Samambaia creek the visitor arrives at the water mill which was used in the past for providing electricity to the farm. The trail has approximately 2.5 km and can be made on foot from the Casa Fernão Dias, one support base of the Sumidouro State Park.

Finally, it is believed that the geodiversity of the Sumidouro State Park may be the basis for the growth of geotouristic activities that should ensure conservation of geosites and regional landscapes. To ensure that these activities achieve success it is necessary to prepare strategies together with the local community, Park managers, visitors and the scientific community.

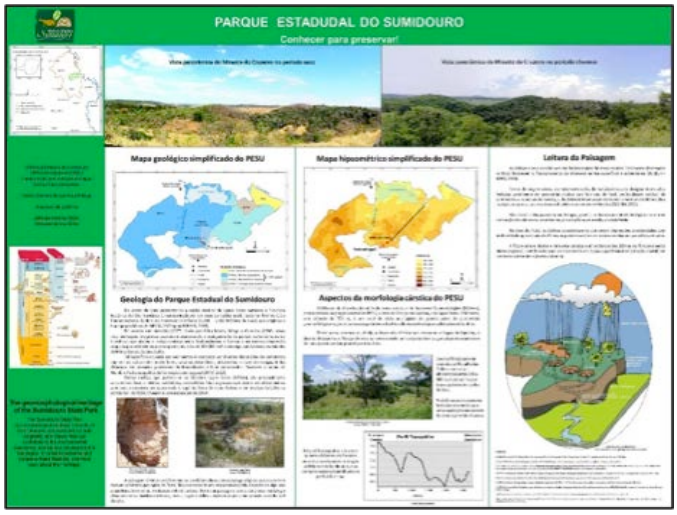
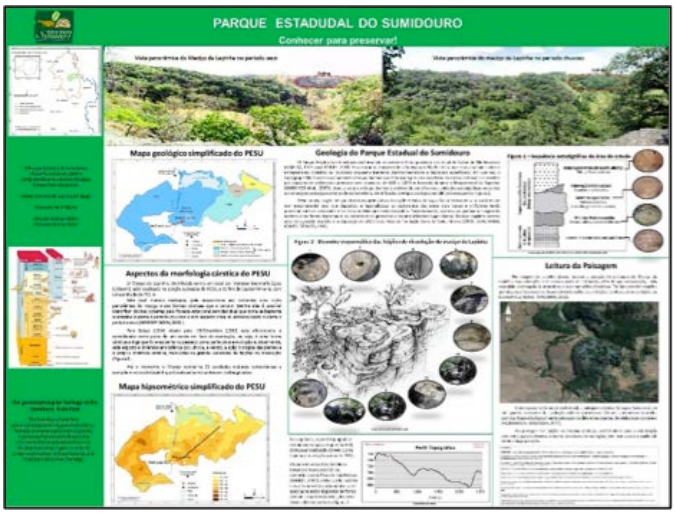
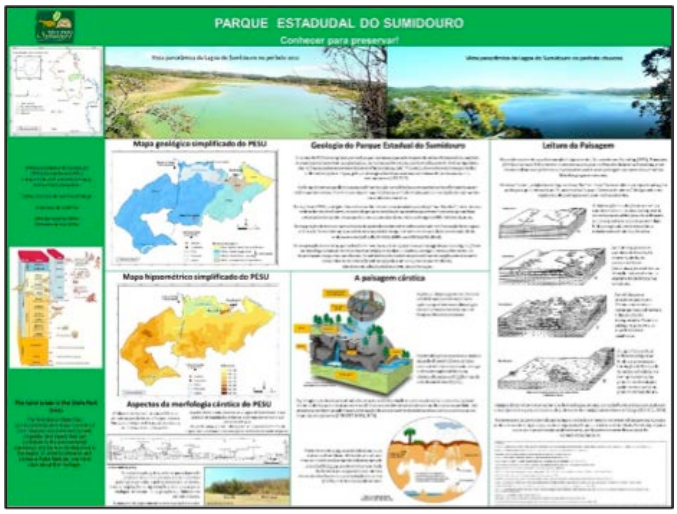


Figure 12 above and next page – Examples of information panels proposed by this work to the Sumidouro State Park. All panels describe the karst landscape with geological, geomorphological and hypsometric maps, as well as schemes, pictures and comprehensive texts.





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THE POSITIVE POWER of CONNECTION

Sasa Kennedy

INTRODUCTION

In 1957 Tilden Freeman wrote, in his seminal book *"Ïnterpreting our Heritage", "Through interpretation understanding; through understanding appreciation; through appreciation protection."*

Tilden Freeman worked with the United States National Park Service and was one of the first people to develop the theories and principles of what we now call heritage interpretation. These principles are followed by all competent interpretive guides and by creators of interpretive signage and other media. If we wish to protect our natural and cultural heritage sites this mantra is worth remembering.

Substitute the word connection for interpretation and the mantra still stands, because interpretation is largely about creating connections. Our connections to a site lead to understanding, appreciation and eventually a desire to protect that site. In an era where governments and institutions are so heavily focussed on commercial interests and ensuring the economic viability of heritage sites, it is essential that we remember the crucial power of connection and foster emotional connections to our sites, in order to help protect them now and into the future.

CONNECTIONS TO SITE

There is a broad range of people who should feel connected to cave and karst sites – staff, both present and past; managers; commercial partners; cavers; scientists; visitors; the local community; those from other related cave sites and, crucially, the traditional custodians or first peoples of that land.

The traditional custodians have looked after the country for many thousands of years. It was, is and always will be their custodial responsibility, a fact which should always be respected by current managers and staff.

In Australia the Aboriginal people, traditional custodians of this land, connected to the land through living on their land and travelling through it; through ceremony, song and dance; and through passing on knowledge through storytelling and ceremony which were age and gender appropriate. The result is a familiarity with, and deep understanding of, the land and the knowledge necessary for sustainable management over millennia.

Current and future managers should ensure it is not only possible, but easy, for custodians to access their lands for ceremonial and other purposes and to participate in, and contribute to, management decisions. The benefits are significant. First, the sharing of traditional knowledge with management will contribute to sustainability, for example the contribution of traditional fire management practices to ensuring the long-term viability of ecosystems on karst reserves. Second it will lead to a deeper understanding of the environmental and cultural heritage values for staff and visitors. Third, and perhaps most important, it enables traditional custodians to remain connected with, or to re-connect with, their lands.

How can we build strong, protective connections to our karst sites in the present day that will help ensure their sustainability? We must always consider, and strive to act on, the power of connection when making management decisions. We must not be governed solely

Learning about Aboriginal connections to land at Jenolan. Photo: Sasa Kennedy

Barry Richard cooks the Australia Day breakfast BBQ at Jenolan. Photo: Sasa Kennedy

by economic rationale. Decisions must be balanced by sustainability considerations and by how the decision will impact on those people who are, or should be, connected to the site – site advocates. Without long-term sustainability and without site advocates and custodians the economic future of any karst site is limited.

It is crucial that staff are connected to their worksite in order that they care for and protect the site in their day-to-day actions. On a daily basis it is staff who will notice when something is amiss and in the long term it is staff who can observe changes over time. Connected staff will act on issues as they arise. But more than that - passionate, knowledgeable staff deliver above and beyond their job descriptions. They can influence site visitors through their interpretation of the caves, karst and reserve; they are well placed as advocates for karst values; and engaged staff are often also volunteers. For example the Jenolan Caves staff (and ex-staff) are members of the Jenolan Rural Fire Service, serve on the committee of the Jenolan Caves Historical & Preservation Society; volunteer their time on Weedbusting Weekends; organise the Jubilee Cave Restoration Project; contribute to the Jenolan Caves Show Cave Survey and work with other speleos to survey the wild caves on the reserve.

So how can managers ensure their staff are strongly connected to the site? An obvious starting point is to ensure best practice training in karst geology, site history and interpretation. It is also important that staff have a sound understanding of the heritage values of the entire reserve, so familiarisations should be included in training schedules.

Many Jenolan staff are members of the Rural Fire Service.
Photo: Sasa Kennedy

There are other important factors which contribute to staff engagement and connection. Fair and equitable treatment, recognition and celebration of staff contributions and a sense of job security are all crucial if staff are to fully connect to the site. Without these many will see their job as a stepping stone to something better, rather than a future career path and a current passion.

Where possible, on-site accommodation has the benefit of allowing staff a deeper insight into the individual species, ecosystems and natural cycles which contribute to the heritage values of the reserve. It also fosters connections between staff, which in turn contributes to staff well-being.

As with staff, managers also need to build a deep connection to the resource they control; natural resource managers need to be hands-on managers. Not only does a sense of connection have the same benefits to be seen with connected staff, but it also prevents an unbalanced view of the bottom line developing. Managers who are distant from the site, in any sense of the word, are less likely to advocate for its heritage values and more likely to concentrate on the career enhancing benefits of economic rationalism. It is perhaps no surprise that our economically fixated governments are favouring this management style, but in the long term it is not a financially viable option. A resource which is not valued by the greater community will eventually and inevitably lose its economic viability.

Grant Commins, previous manager Cave Operations at Jenolan Caves, in Coronet Cave, Jenolan.
Photo: Sasa Kennedy

A connected manager is an advocate for their site – one with a powerful voice. A connected manager understands that the best way to protect the site (and its future economic stability) is to build connections between the site and as many other advocates as possible. A connected manger is not threatened by the connections others have to the site; they understand that their karst site is actually enhanced by these connections.

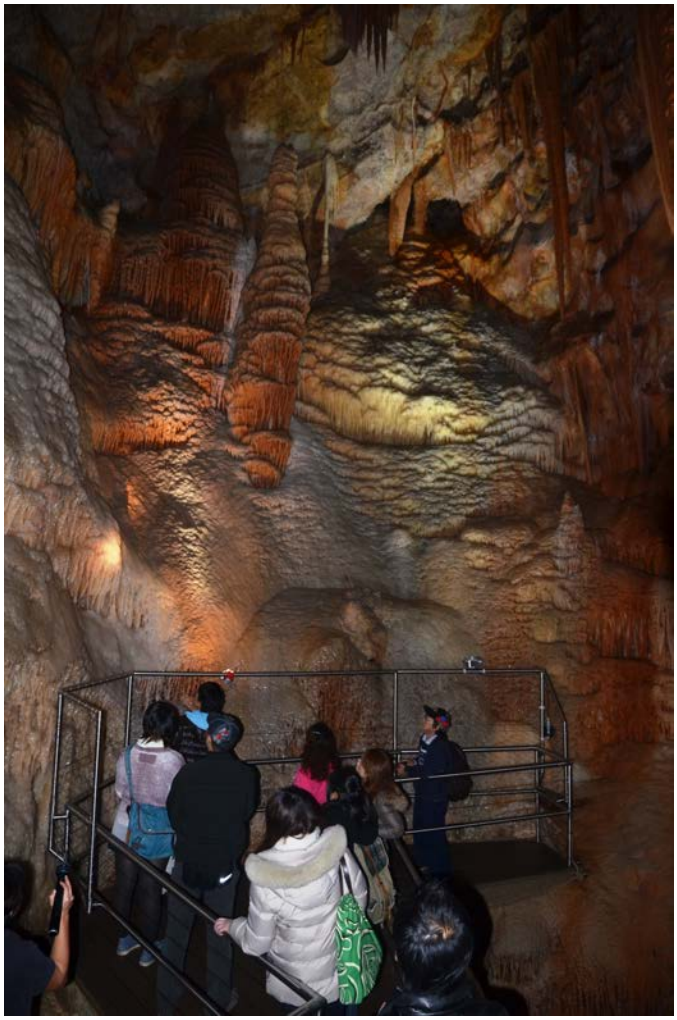
In Aboriginal and other indigenous cultures the elders are respected and highly valued for their experience and wisdom. In our current culture the opposite is often the case. In a world where technology is advancing so swiftly and knowledge appears to be so easily attained, the role of the elders is frequently overlooked or dismissed. Their knowledge is frequently seen as out of date; their wisdom undervalued. But if we hope to learn from history and utilise the full scope of expertise when making decisions for our sites we need to value our elders – retired staff and previous managers - for their long connections to our sites, and we need to heed their advice. This is not to say that we should always be in agreement, but it does mean that when weighing up options we should include their opinions in the decision making process. We should encourage their participation on advisory committees and their roles as mentors to current management and staff. We should include them in our social gatherings and celebrations wherever possible.

Our tourism and commercial partners also need to feel connected to our sites if they are to deliver the best possible outcomes for us. Respect and warmth of welcome, familiarisation visits and invites to special events all contribute to building a connection between our partners and our sites. Connected partners are like roving ambassadors for the values of our sites. When they begin to understand, appreciate and even share our values they can instil a minimal impact ethic in our visitors before they even arrive. They can also be advocates for our sites in difficult times. As commercial operators they may have access to powerbrokers that managers of government owned sites do not.

Along with good commercial relations, good neighbourhood relations also bring a range of benefits. Community members are often volunteers in organisations that help protect karst reserves including bush regeneration, rural fire services and clubs which provide support for special events, such as Rotary and Lions clubs. It is also worth considering involving local garden clubs in your site. Gardeners are often quite competitive, so having two groups looking after different garden areas could be even better value! Voluntourism initiatives can stretch your neighbourhood beyond the seas by emotionally connecting local and foreign youth, the leaders of the future, with your site.

Locals can often provide a degree of asset protection, merely by being observant when passing through or passing by. They are also a source of excellent word of mouth recommendations and return visitation through

Richard and Stephen Kennedy picking up some tips from John Callaghan.
Photo: Sasa Kennedy



IEC Oceania tour in Orient Cave, Jenolan.
Photo: Sasa Kennedy

bringing visiting friends and relatives to favoured sites. You can help them to connect more strongly by assisting with fundraising for local causes and becoming involved in community initiatives. A rewards card which offers discounts to returning locals or a great site café can also enhance relationships between your site and the local community.

Like traditional custodians, cavers will likely have a significant depth and breadth of knowledge of your site. Significant contributions made by cavers include exploration, surveying, making connections, asset protection, reporting of changes in fauna, flora, hydrology and cave conditions and, both as individuals and through speleological associations, karst advocacy. Clearly they are very important assets for your site and, as such, you should encourage connections between the site and the cave community. Strengthen ties by sharing facilities, being welcoming and encouraging interactions between cavers, staff and visitors. Encourage your guides to include aspects of local caving endeavours in their interpretation. This will also add a point of difference to your cave interpretation.

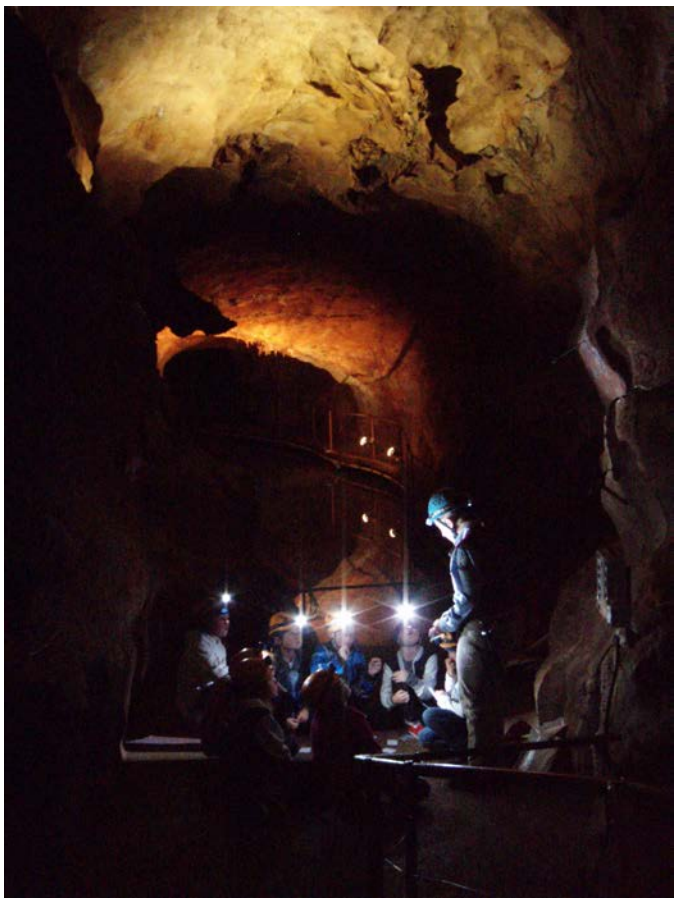
Breaking the Boundaries tour, Jenolan.
Photo: Sasa Kennedy

As Tilden Freeman said "Through understanding appreciation; through appreciation protection". Scientific interest in your system should be sought and strongly encouraged. If scientists are investigating aspects of your karst you should engineer opportunities for staff to work with these scientists and assist where possible. In addition create chances for staff workshops and seminars in order to build your staff knowledge base. There will be an advantageous flow-on not just to staff but also to your site visitors. The science at your site can provide a valuable point of difference between your site and other karst areas, but only if it is interpreted effectively.

Given the many attractions and distractions available to fill our leisure time you may only get one chance to build connections between your site and site visitors. Exceptional and authentic experiences which include best-practice, engaging, entertaining and informative interpretation can build these connections in just one visit. If connections are built through a well-presented environment, genuine, caring customer service and interactive interpretation, visitors will be inspired to protect your site; even one-off visitors can become site advocates.

Of course, return visitors will continue to build stronger connections, so return visitation should be encouraged. Some passionate visitors will continue to return without much effort on your part; by providing meaningful experiences which enrich visitors' lives and refreshing the interpretative experiences on offer on a regular basis, you can provide strong incentives for others to return.

To build connections through return visitation, managers need to ensure they are catering to all their market segments from children to adults and not forgetting that frequently overlooked market - youth. Our traditional custodians understood the importance of age-appropriate learning. They utilised storytelling, challenge and games successfully for millennia to pass on knowledge from generation to generation. Children not only grow into advocates for sites which hold a place in their hearts from childhood, they are also very good at educating and influencing their significant adults. The future resides in our children.



Junior Explorers children's activity, Jenolan
Photo: Sasa Kennedy

Connections between our sites and their staff, visitors, management and community are clearly important. However they are not the only powerful connections we need to forge if our sites are to receive maximum benefit. Connections between people are also crucial.

CONNECTIONS BETWEEN PEOPLE

Connections between staff contribute to staff well-being, which lowers stress levels and improves Workplace Health and Safety outcomes. They create informal opportunities for sharing ideas and knowledge. They also strengthen commitment to the site.

Connections between staff are more easily maintained in a well-informed, fair and secure workplace. Social events can help build camaraderie. When staff live on or near the site it becomes easier for social connections to be built.

Social events also strengthen connections between management and staff, as do acknowledgement of contributions, opportunities for staff development and celebrations of achievements. Connections between staff and management build trust and goodwill which encourage the search for a win-win situation if disputes occur.

Both staff and managers need to be protective of their site, but not territorial. If we agree that to build connections with others is a good thing for the site, then we must be inclusive. When all stakeholders not only feel connected to the site, but feel that their contribution and connection is valued, great things can happen.

To ensure this inclusiveness occurs staff need to show their passion for the site and be protective of it, but also share it with generosity and treat visitors as individuals. They should respect and understand the needs of tourism partners and ensure they feel part of the team. Good relations will be obvious to the visitors they bring to your site, who will then be confident in their own welcome. Trust will encourage initiatives be considered and ensure they get an airing. As with connections between staff and management, if partners' personal connections with staff and management are strong any issues will be more easily resolved.

Opportunities should be provided for previous staff to return to site. This allows for the passing on of knowledge and connects present staff to their heritage. Likewise, staff and community should be encouraged to build connections through participation in community organisations including bushcare and rural fire services and through the opportunity for the local community to utilise the site, on occasion, for ceremony and celebration. The connections built in this way are more valuable than any income which may be received for the hire of the site to valued community organisations.

Connections between staff and cavers should be actively encouraged as they connect your staff to the wider speleo community and their vast knowledge base. Caving experience and caving connections also increase guides' job satisfaction and make for more informed

David Hay, as James Wiburd, discusses the Binoomea Cut with Bill Mark at a Jenolan Historic Weekend Photo: Sasa Kennedy

interpretation. Another valuable aspect of guide-caver connectedness is that it creates access to a capable and willing source of volunteers and can serve to strengthen minimal impact practices, a major facet of which is giving something back to the environment.

An example is the Jubilee Cave Restoration Project, the initiative of a Jenolan guide (ex) who has worked with a number of caving clubs, a few guides and many TAFE students to remove over 6.5 tonnes (so far) of builders' debris from the cave, where it had been dumped on flowstone and other crystal. As this debris was not on the route of the tour it was, of necessity, never going to be a priority for cave maintenance. Volunteers can focus on worthwhile projects that do not connect directly to the financial needs of management, but contribute significantly to karst preservation.

Similar connections between staff and scientists can increase the odds of developing innovative solutions to management issues.

While traditional custodians will always maintain their connections to the land, it is important that we do not overlook the importance of connections between traditional custodians and staff, or traditional custodians and visitors. Managers should create opportunities for staff and custodians to meet, to take part in ceremony together, to tell stories, to share and learn from each other. Karst sites will benefit enormously when traditional custodians and staff custodians are given the opportunity to build meaningful relationships and genuine respect through understanding and shared vision.

Likewise visitors will enjoy learning from traditional custodians, building their own connections to the site and also to traditional culture. "Through interpretation understanding; through understanding appreciation; through appreciation protection". Your cave site can be

Connecting traditional custodians to staff and visitors, Yarrangobilly Caves, 2014

ACKMA builds connections across karst sites which benefit all
Photos: Sasa Kennedy

a bridge for building connections and goodwill between people.

Connections across sites, such as those fostered by ACKMA, can lead to fresh perspectives, fresh solutions and innovation through sharing of experience and knowledge. They also build professional advocacy. The sense of belonging to something bigger, along with exposure to a range of perspectives, can encourage innovation and development. Professional associations also provide strength of numbers when advocacy is required.

For sites under one agency their shared heritage can lead to valuable connections through staff exchanges, training assistance and resource sharing. Rather than seeing each other as competitors they can support each other to achieve better outcomes for both. Personal connections make achieving these outcomes far more likely than personal competitiveness.

Even between similar sites under different agencies, connection and friendly competition can lead to better outcomes. Each site can benefit from exposure to different ways of doing things and from shared promotion and advocacy. Friendly competition can encourage best practice operations.

Another exciting possibility when connections are sought and welcomed between karst sites is the chance of developing mentoring connections between the strong and the small, the established and the developing sites. In such connections we can share knowledge and perhaps resources to help protect the more vulnerable karst sites, not just in Australasia but also in the developing world. We can encourage best environmental practice and advocate not just for vulnerable sites, but for vulnerable people.

The traditional model of Caring for Country seems to me to have been based on three major precepts – presence on land, performance of ceremony and passing on of knowledge. These three forces built strong connections to land and protected that land. In the modern era the best practice model of sustainable management is also based on three precepts – development which takes into account people, place and profit. In both cases it is connections which preserve our precious sites for the future.

CONCLUSION

Traditional Caring for Country is based on building connections to the land through presence on the land; performing ceremony for the land and passing on knowledge through storytelling, music and dance in an age and gender appropriate manner.

To Care for Country in the modern era we also need to build connections by being physically and emotionally present on our sites, sharing age-appropriate knowledge and inspiration through targeted interpretative activities and ensuring opportunities are available for others to connect to the site in meaningful ways.

Rebuilding an emotional connection to our natural and cultural heritage is the sustainable way into the future. We must aim for, balance and respect the triple bottom line – people, planet, profit – in equal measure if we hope to maintain our sites for future generations. To do this we need to nurture the connections between people and place, and strengthen the connections between the people who Care for Country.

DEDICATION

In memory of John Callaghan,
Jenolan guide and custodian,
who instinctively understood
the positive power of connection
and generously shared his knowledge
through storytelling and ceremony

REFERENCE:

Tilden, Freeman 1957 Interpreting our Heritage, University of North Carolina Press.

CAPRICORN CAVES:
and a very BRIEF HISTORY of AUSTRALASIAN CAVE LIGHTING

Kent Henderson

It was way back in early 1991, nearly 25 years ago, that I first visited Capricorn Caves, near Rockhampton, and initially met (now) ACKMA Life Member Dianne Vavryn and her husband Joe, who have remained my firm friends ever since. Of course, at the same time I met Ann and (the late) Ken Augusteyn who had been the owner/managers of the caves for a mere three years.

At that stage they knew relatively little about cave and karst management, and had never heard of ACKMA. Well, that soon changed! I *induced* Ann to attend the upcoming 9th ACKMA Conference at Margaret River, Western Australia, and also to bid for the 10th Conference in 1993 - which she won!

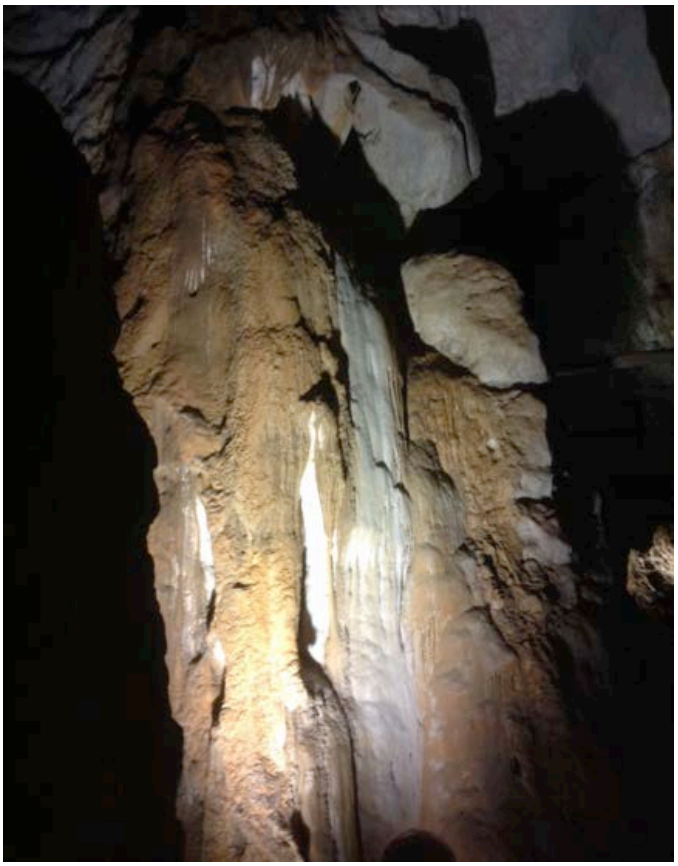
Dianne Vavryn, Kent Henderson and Ann Augusteyn at Capricorn Caves
Photo: Kent Henderson

Indeed, the 10th Conference was an outstanding success, with a (then) record 62 delegates. Ann has been a regular ACKMA Conference attendee ever since, served a term as Vice President, and latterly was elected as a Fellow of ACKMA. In the last 25 years she has certainly developed into an 'expert' (however one defines the term...). In that time, the main thrust of her development of the cave system was above ground. The results have been awesome including a full range of top class accommodation, a conference centre, a wonderful visitor centre with a large and excellent interpretative area, and much more.

There was an exception to my plaudits...while the above ground development was outstanding, below ground its re-development was underdone. Certainly, much updated and new tracking (largely wood, an issue in itself...) and disabled access were installed. However, the cave was desperate for re-lighting; to say the existing 32v lighting (installed in the 1970s...) was tired was definitely an understatement! I was 'on her case' over the succeeding years, rarely failing to mention to Ann the wonders of new cave lighting happening elsewhere. Ah, it was all a matter of money... Yes, well, such was the case with the above ground developments too - all a matter of priorities; but I did understand the economics, nonetheless.

The fossil dig site in Capricorn Caves. Superbly lit, with the surrounds neatly offsetting LED and natural lighting.
Photo: Kent Henderson

It has been most interesting to witness the development of cave lighting in Australia and New Zealand since I attended the foundation meeting of ACKMA at Yarrangobilly way back at the 7th Conference in 1987. At that stage, cave lighting everywhere largely consisted 240W domestic light globes and parafloods (with lampenflora rampant), or the even more archaic 110V fittings at the likes of Jenolan and Wombeyan, with the globes needing to be especially imported from the USA -



A newly-lit feature, with the LEDs set to give a contrast between light and dark. Photo: Kent Henderson

to even 32V fittings at Princess Margaret Rose Cave! We have certainly come a very long way since 'the old days'...

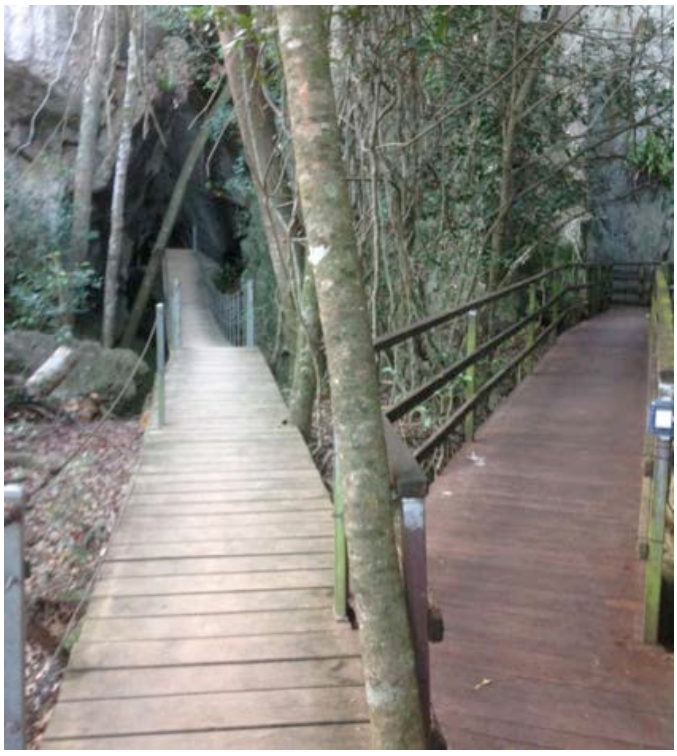
The first real attempt at innovative cave lighting was effected by the then local rangers at Kelly Hill Cave on Kangaroo Island - Herb Stichel and Roger Collins. They started by stripping all the (very!) old lighting and conduit out of the show cave and starting again. They basically had an electrician place about half a dozen power boxes strategically in the cave, and ran multiple conduit from each themselves.

Their aim was to effectively light the key features of the cave but in doing so to hide both the conduit and the light fittings. And they spent hours doing it to get it right! Of course, pretty much the entire floor of Kelly Hill cave is strewn with boulders of various sizes, which in itself greatly assisted their task. The result was outstanding. You could probably have argued that Kelly Hill was the 'world's best lit show Cave' at that time. Nowhere in the cave could a light bulb or any conduit be seen from the tourist track. Very much 'state-of-the-art' - then...

The next impetus in cave lighting came via (ACKMA Fellow) Neil Kell, the erstwhile manager of Yarrangobilly Caves (and long term casual guide) who won a Churchill Fellowship to study cave lighting around the world. Neil became, as a result, a world-class expert, and his CV runs to the re-lighting of many Australian caves - at Yarrangobilly, Hastings, Cutta Cutta, and overseas, as well as consulting.

Over the same period, lighting technology advanced - in came dichroics and associated innovations; gone were strands of ugly domestic light globes blinding tourists and washing out the cave features they were supposed to illuminate.

And latterly, along came LEDs, the technology now developed to the point of greatness - with low cost, low intensity, yet high light yielding fittings from 'pencil lights' to focused parafloods. What Jenolan electrician Dave Rowling has achieved in re-lighting various caves at Jenolan, using LEDs, has been awesome.



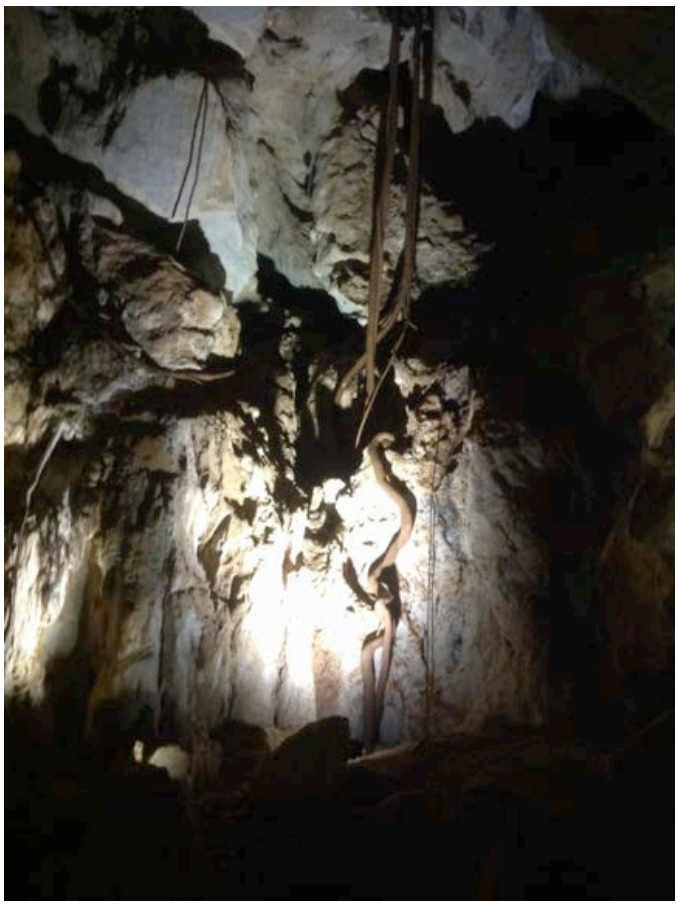
Entrance infrastructure at Capricorn Caves. The extensive use of timber tracking in the caves was largely inherited by the Augusteyns. Wood in caves is not a good idea, but in their prevailing 'largely dry' cave environment, degradation is not the potential issue it is in 'wet' caves. Photo: Kent Henderson

An LED track light at Capricorn Caves
- *very effective.*
- *Photo: Kent Henderson*

It is fair to say that as a group, the show caves of Australia and New Zealand are the best lit in the world. Indeed, over the life of ACKMA - so to speak - virtually every one of our show caves has been re-lit (some more than once!)....until recently with one major exception.

And so, I return to Capricorn Caves, and my long term 'nagging'. But, hallelujah! With the help of some government funding from the Tourism Industry Regional Development Fund (TIRF) at last it has been done! Well done, Ann, and team! (finally...) Although I will say, waiting for the latest LED technology was probably a good thing. However, having the technology doesn't necessarily mean the job will be done well...

The Capricorn Caves re-light was very largely achieved by Ann's son, John Augusteyn (with technical advice from Dave Rowling and help from staff member Lucas Zielke). John, who is a Senior Conservation Officer with the Queensland Department of National Parks, Sports and Racing, had - obviously - grown up in the cave, not literally, but close. He therefore knew every nook and cranny, and over the years has clearly developed a great empathy for it. And he has achieved a truly outstanding job! Features not highlighted before now are. Light globes are rarely seen from the immediate tourist track - virtually all have been well hidden. Most (but not all - I quibble) conduit is also hidden. The cave is not over-lit, nor under-lit. In my view John has got the balance largely right. Pretty much 10 out of 10 Ann and John! So, it was worth the wait...albeit a very long one.



Back lit tree roots in Capricorn Caves. The LEDs have been skilfully set to highlight the feature, and at the same time provide an 'air of mystery'. Photo: Kent Henderson

Of course, in May next year ACKMA will be holding its 2016 AGM weekend at Capricorn Caves (although I am disappointed it won't be a full ACKMA Conference...). Nonetheless, it is an event not to be missed. It can now be said, without any doubt, that both the above and below ground infrastructure of Capricorn Caves is collectively amongst the best in the world. Well done Ann, and crew, you have done us all proud!

BOOK REVIEW
CAVE by RALPH CRANE and LISA FLETCHER

Greg Middleton

Back in February I attended a seminar at the English Department of the University of Tasmania which had been advertised as *"Cave Genres/Genre Caves: Reading the Subterranean Thriller."* The seminar was jointly presented by Ralph Crane, Professor of English at the University and Lisa Fletcher, Senior Lecturer in English. For the most part it seemed to be a rather esoteric discussion about people's interactions with spaces under the Earth. The thesis was presented that people's usual initial response to caves was fear stemming from apprehension about the unknown and darkness. If they had a continuing interaction with or experience of caves their response supposedly changed to a feeling of security and even protection, presumably from "Mother Earth". There followed a series of outlines of recent novels dealing with caves and how the main characters had responded to the unaccustomed environment.

The cover of Cave. 'Nature and Culture' also appear here but they are apparently not part of the title. It's hard to imagine a worse cover for a book about caves.

While it was noted that most of these characters had been brought into contact with caves by forces beyond their control, rather than entering them because they liked the idea, it seemed to be assumed that their responses were typical of people generally. The discussion then went on to consider recent films dealing with caves, once again considering the responses of fictional characters to the challenges of their underground experiences. My primary thought as I came away from this seminar was "it's amazing what academics can find to study". Although it was mentioned that a book was in the offing, I wasn't going to be waiting around with great expectations of it. I was slightly surprised, since there is only one caving group in southern Tasmania, that neither it nor any of its members had been approached by these academics for any sort of input to their studies.

I thought no more about the book until a friend mentioned he had seen a copy of a book called just *"Cave"* in a Hobart bookshop. (Maybe it's title is *"Cave: Nature and Culture"* which it sort of has on the cover, but only *"Cave"* appears on the spine and on the title and half-title pages.) On the next available occasion, 23 June, I checked it out – and of course, bought a copy (despite the cover, of which more later). It's fair to say that, at first glance, I was agreeably surprised by this publication.

Cave is actually an attempt, within a small book (15 x 21cm and 222 pp), to encapsulate much of what humans know and think about cavities under the earth. Far from being an obvious product of an English Department, the book is part of "The Earth Series" published by Reaktion Books, London and is classified as "popular science". Its official publication date was 1 July 2015.

The preface points out that;

> *Caves are fundamental to human history. They are simultaneously places a shelter and places of deep, dark danger. [Ah, something that harks back to the seminar.] They are places of birth and of burial, dwelling places and sanctuaries from persecution. They are a human habitat and the home of mythical monsters.*

Chapter 1 demonstrates that the term 'cave' is far from straightforward. They quote definitions from dictionaries and speleological works, showing that it is not easy to define the meaning of the English word 'cave'. It is said that an isolated subterranean cavity cannot be a cave but goes on to acknowledge the term 'entranceless cave'; it says a rock shelter or cliff-side overhang is not a cave – unless it contains "mineral formations typical of a 'true cave', or provides habitat for organisms which populate caves" – in which case "it may be described as

Not one of Steve's greatest images – but it does help break up the text. Twilight Cavern lava tube, Plaine des Roches, Mauritius.

a 'borderline cave'". I thought it was only cavers who indulged in such pointless nit-pickery (but perhaps the issue has to be raised). Surely better to just accept that a cave is a cave if it looks like one – and you want it to be. Fortunately they go on to make some interesting points about caves and how we see them – and how they have been seen through history.

At this point I have to say that, sneaking a look ahead, I was somewhat disappointed, given the Tasmanian abodes of the authors, that the book doesn't have more Tasmanian associations or references – it is as international as the publishers no doubt required it to be. Skimming through the reference list – in this case compiled chapter by chapter using those annoying little superscript numbers that students of the humanities are so prone to use (and emphasising that it is not a product of a Science Department) – and the brief 'select bibliography', one is struck by the few Australian sources that have been utilised. Dave Gillieson (Caves: Processes, Development, Management 1996) is cited – at least 7 times (but this book was published in the UK), Elery Hamilton-Smith but twice (from his entries in Gunn's Encyclopedia of Caves and Karst Science) and Armstrong Osborne only once. Steve Harris, Don Ranson and Steve Brown get a guernsey for their paper describing the hand stencils in Ballawinne Cave. Of Tasmania's Carey, Goede, Kiernan, Clarke and Jacksons – nary a mention, nor of national speleological authors like Trickett, Woods, Jennings, Spate, James, Whites … Finlayson & Hamilton-Smith (*Beneath the Surface: A natural history of Australian caves*) rates a mention in the 'select bibliography' but didn't provide one fact worth citing in the text. This is the only Australian book in the bibliography apart from Shaw's *History of Cave Science* which it manages not to acknowledge was published by the Sydney Speleological Society. In the acknowledgements section Elery Hamilton-Smith is thanked "for generously sharing his knowledge of caves with us" and Deb Hunter "for caving trips". It's good to know they actually went on some. The volume is lavishly illustrated, though nearly all of the photographs and graphics are from overseas; exceptions are the photos by our Esteemed Editor, of which there are nine (including one I was surprised to find myself in! Well done, Steve.) Unfortunately, many of the photos seem just to have been inserted to break up the text and do not relate directly to it.

This digression was prompted by my noting a quote from Adrienne Eberhard's poem *"Earth, Air, Water, Fire"*. Given the significant contributions to Australian speleology of Stefan and Rolan Eberhard, it is perhaps ironic that it is Rolan's wife who rates a mention in this book, rather than either of them.

I shouldn't give the impression the book is not about science, there are many scientific details given about a broad range of caves, many of them from impeccable sources, but some facts just appear out of thin air. For example, we are told that Bungonia Caves "have unusually high levels of foul air due to the decomposition of masses of organic matter washed into the cave during heavy rainfall and a lack of ventilation" but there is no reference to the source of this intelligence. Sadly, they fall into the trap of contrasting 'true karst' with that now out-of-vogue in informed circles term 'pseudokarst' (Eberhard & Sharples 2013) – nevertheless, they show a good general grasp of karst cave development concepts (though I don't think hypogenic concepts (Klimchouk 2007) get a mention). Volcanic caves (in the form of lava tubes) rate only two brief mentions, though they are featured in a couple of the illustrations (perhaps without the authors realising).

Chapter 2 presents a fair introduction to 'speleology' (very largely, and with acknowledgement, drawn from the writings of Trevor Shaw – and where better to start?) Early cave-scientists are introduced, along with terms such as 'karst', 'phreatic' and 'vadose' and a number of major cave-related texts. Speleology is not just a multi-disciplinary field, it carries overtones of exploration and adventure. The authors are fascinated by the metaphors drawn on by people trying to describe caves: decorated chambers are 'galleries', cave floors are 'repositories', entrances are 'mouths', twisting passages are 'bowels'. Their comments are verging on the critical – as though we should have come up with new words for these spatial elements. There are some interesting observations on cave maps and their limitations; they point out that caves are not really limited to the spaces we can walk – or crawl – through but are just the more open parts of much larger systems of interconnected spaces. Despite the fact that they are probably the features people associate most strongly with caves, speleothems don't get much of a mention. A quote from Tom Sawyer serves to explain the process of stalactite formation and how slow it is. The interesting range of other speleothems is ignored as is the valuable role they (especially stalagmites) can play in revealing past climates and in dating climatic events.

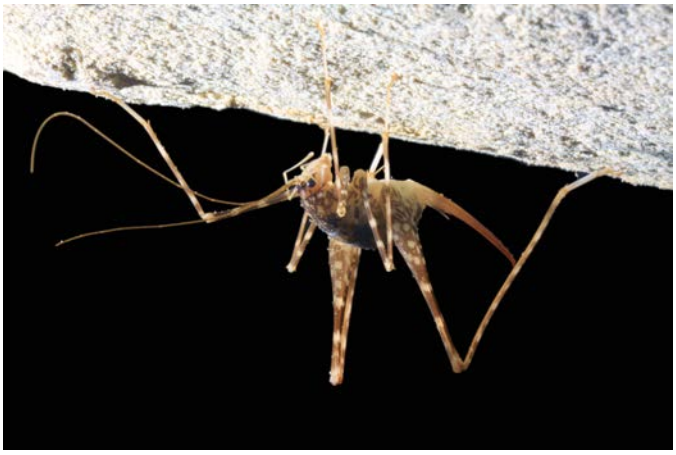
The third chapter deals with the adaptations of animals, including humans, to caves. It is a characteristic of this book that it does not just relate the 'scientific' facts but strays off into dead-ends such as Linnaeus' erroneous ideas about *Homo nocturnus* and H.G. Wells' imaginary flesh-eating troglodytes, the Morlocks. There is a lot of attention paid not just to observed facts, but to ideas and concepts relating to caves, even those that are purely the imaginings of novelists, presumably based on the assumption that these give us insights into how people perceive aspects of caves. That said, the treatment of the development of biospeleology, and particularly its changing systems of classification, is well put together and seems accurate, despite more literary diversions (does a discussion of the nature and depiction of Tolkien's Gollum really have a place here?). David Attenborough comes in for some criticism for his perpetuation of the 'traditional perspective' of caves as islands. The implication is that caves are linked in many ways to the surface and deeper mesocaverns, so are not really isolated but it is true that for some species the daylit spaces between caves and the more or less solid rocks – especially non-karst ones, do isolate them; for such species the islands analogy is valid.

While cave-dwellers get fair recognition, there is no mention of the role caves can play in preserving the remains of earlier life, particularly vertebrate remains as in the remarkable deposits at World Heritage listed Naracoorte Caves and the Nullarbor's Flightstar. I don't think the word "palaeontology" gets a mention anywhere.

Cave explorers, from early humans to modern-day cavers, form the subject of chapter 4. A 1991 poem is quoted in relation to speculation about whether cave painters were actually explorers and then we move on to the early scientific explorers of Europe and then to Martel, "the father of modern speleology" and his impact on British caving. Casteret receives a no-doubt-deserved page. Development of European and US caving is traced – Floyd Collins gets a mention, the NSS was set up in 1941, a 'map-as-you-go' ethic for trips into new caves was developed, cave rescue organisations sprang up, new depth records were achieved. There is a rare error on page 84: sometime Tasmanian caver Jason Gardner is quoted explaining his love of underground exploration and it is stated that Tasmania has the longest and deepest caves in Australia – sadly only the latter is true (Bullita in the Northern Territory has held the longest record for a number of years now and the Jenolan system is probably second longest, pushing Tassie's Exit Cave into at best third place – more may be longer). There follows a section on cave diving – not outlining the great achievements of this admittedly dangerous pastime (other than by Casteret), but cataloguing a series of fatal misadventures.

Monsters and magic: Caves in mythology and folklore is covered in chapter 5. It doesn't tell us much about caves, but perhaps provides some insights into human fears and imagination. Chapter 6, on the other hand, deals with the reality of cave art – both art in caves and art featuring caves. This is a fair coverage of the subject with Australian Aboriginal art getting a mention, from Koonalda on the Nullarbor, finger fluting in caves near Mt Gambier and even, in Tasmania, Ballawinne in the Maxwell River valley and Wargata Mina (Judds Cavern) in the Cracroft.

Chapter 7, on caves in literature, is where we would expect these authors to excel – and we are not disappointed. Coleridge gets a good run, of course, but they might have brought it back to reality by totting up how many actual caves, or parts of caves, have subsequently been named after Kubla Khan or his



Another image that made the book.
Cave cricket at Naracoorte Caves.
Photo: Steve Bourne

Xanadu. Also mentioned is Auden's poem, "In Praise of Limestone", which I have to admit is a favourite of mine. They go on to find caves in Shakespeare, Hardy, Steinbeck, Forster, Defoe, Tolkien, Verne, Twain and more recent fiction – but it is all fiction (and did Enid Blyton really deserve a mention?) Again, this chapter tells us nothing about caves, but something about some people's ideas/fantasies about them.

The next chapter, on religious use of caves, does bring us back to real caves. While it is true that there has been widespread use of caves by a range of religious groups around the world, I have to say that of the many cave shrines and temples that I have seen, almost every one has resulted in degradation of the natural features and beauty of the original cavern or grotto. Never is there any thought for protection of the cave itself – always it is painted, decorated, concreted, excavated, disfigured and modified in ways that demonstrate no concern or interest whatsoever in what the worshipers surely should have seen as wondrous examples of their deity's handiwork. While the authors point out that many "holy" caves have become tourist attractions, never do they acknowledge the enormous damage that religious conversion has wrought on caves.

The final chapter deals with show, or tourist caves. It is perhaps the most information-rich chapter in the book, with not a lot about perception and few references to literature. There's a historical treatment, beginning, of course, with Postojna, working through Europe and the USA to Australia, then back to Europe before getting to Asia, where there is (thoroughly justified) critical mention of the use of "unnatural coloured lights and bright neon signs". (If the authors appreciate the travesty of this practice, how did they allow a thoroughly awful photo of such a cave to besmirch the book's cover? I think it may be the worst cave-book cover I have seen.) Jenolan gets a good wrap, especially for its range of tours, even to mentioning its Nettle Cave self-guided one – and, of course, they pick up on the commentary being available in Klingon). JCH&PS gets a plug.

On the first page of the chapter we are told that 'show caves' can also be called 'tourist caves' – as far as I was concerned, the commonly accepted wisdom – but at the end we are told that adventure caving has "blurred" the use of these terms (how can one blur the use of two terms that are the same?) – because tourist caves can be "undeveloped, or only minimally developed" while show caves' common hallmarks are lights, pathways and interpretation. This distinction, I suspect, is as artificial as the lighting in most Chinese 'caves developed for tourists'.

Appended are 1) a list of "Notable Caves' (presumably to avoid that now-confused distinction between 'tourist' and 'show'), 2) the references (divided up into chapters, littered with "ibid" and giving journal volume numbers in Roman numerals!), 3) a (very) 'Select Bibliography', 4) a list of relevant associations and websites (in English) – though missing the Karst Information Portal (http://www.karstportal.org/about), "the digital library linking scientists, managers and explorers with quality information resources concerning karst resources", 5) acknowledgements (it appears that EHS was the only speleologist actually consulted and Deb Hunter the only cave guide), 6) photo acknowledgements and 7) a reasonable index.

While I've been about as critical in this review as I ever have been in a cave-related book review, I found much of interest in this little book and it is certainly well-crafted (if one can overlook the ghastly cover). Nevertheless, I can't help but feel this book would have been better had it involved someone with a long relationship with cave exploration and/or studies. The title implies it is going to be the definitive book on the subject – it's not (though it's probably not a bad effort by a couple of "outsiders"). No doubt there are benefits from having a subject reviewed through 'other' eyes. As the endnotes say: "this book examines the allure of the subterranean world" – perhaps it should have been titled "The Allure of Caves". I won't say every speleophile should have a copy on his or her bookshelf, but I don't doubt many will.

Cave is published by Reaktion Books, London, July 2015, in their popular science 'Earth Series' RRP $29.99.

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NARACOORTE 2015: 21st AUSTRALASIAN CONFERENCE on CAVE and KARST MANAGEMENT

Steve Bourne

It is hard to believe that it is 16 years since the 13th conference was held at Naracoorte. The 1999 version was actually based at Mount Gambier, with field trips to Naracoorte and other sites. The 2015 version was based in Naracoorte and two field trips visited the lower parts of South Australian and western Victoria.

A few keen cavers arrived early for some pre conference caving. I took one group while Clare Buswell from Flinders University Speleological Society (FUSSI) looked after the second group. My group of John Brush, Marjorie Coggan, Cath Loder, Sasa Kennedy and Dave Smith visited Beekeepers Cave on Friday morning, a private cave that is often used by scout groups, and less often, university groups. It is almost devoid of speleothem development, but is nevertheless a most interesting cave, with 3 main parallel passages connected by low crawls. It has an unusual entrance, twin solution pipes intersect a small "chamber" before descending into the cave proper. There had been some discussion in the weeks prior regarding scratches in the cave that were suggested to be made by the marsupial lion *Thylacoleo carnifex.* We inspected many scratches but it is difficult to assign any to a species, especially and extinct species, in the absence of any other evidence.

John Brush and Cath Loder climbing into Beekeepers Cave.
Photo: Steve Bourne

The afternoon trip was meant to be into a cave in a Council-owned quarry. I had checked it a few weeks previous and decided it would be OK to visit, but had not ventured far in. The trip was cut short when I realised the cave had in fact collapsed not far inside the entrance and access was no longer possible. Unable to

John Brush (foreground) taking a photo in Beekeepers Cave.
Photo: Steve Bourne

cave, we spent some time digging marine fossils out of the soft limestone.

Saturday was a Sand Cave trip. I have a real liking for this cave, having negotiated access to it in 1997 after it had been closed to cavers since the late 1960s, and then negotiated to purchase it on behalf on the Environment Department in 2010. Miles Pierce joined our group for this trip. Entrance is gained via a 20 metre deep twisting solution pipe, which opens into a small chamber. A short crawl then takes you into a large chamber with enormous sand cones, which give the cave its name. I did not take my camera as I have plenty of photos of this cave, which allowed for more time for John Brush to exercise his camera trigger finger.

In Sand Cave.
Photo: John Brush

John, Cath, Dave and I took on the sand crawl, a long tight crawl which is now slightly enlarged after recent caving trips and some nervous cavers scraping sand to make access easier. We reconnected with the rest of the group and after more photos, set out to find the end of the cave, which I had been unable to locate on two previous trips into the cave. Eventually, I found the right squeeze and we visited the last large chamber near the end of the cave. This is very low levels of impact, as the cave was closed soon after it was discovered and is certainly worth keeping access to a minimum, and defining a pathway, to maintain its condition. It has nice speleothems and (almost) untouched sediment cones, some of clay and others of sand.

The Sunday morning trip was into Fox Cave on park, my favourite cave for taking visitors into while I was working at Naracoorte Caves. It is a reasonably complex cave (for Naracoorte) with excellent speleothems, tree roots and fossils. Like Beekeepers and Sand Caves, it also had scratches. The group became quite obsessed with finding scratches and tree roots, leading to the caving being named the "roots and scratches" caving trip.

Tree roots in Fox Cave.
Photo: John Brush

Prior to us starting the days' caving, I had given options for lunch, alerting the group that pizzas at the Naracoorte Hotel were two for the price of one on Sundays. Dave Smith thought this was a great idea, pizza and beer for lunch between caving trips. It was very pleasant, but drinking beer before a caving trip is not always a good idea. One of the group had to utilise a bottle in our next cave, Starburst Chamber, which is part of Victoria Fossil Cave. This highly decorated cave was a nice conclusion to three days of caving for my group.

Group "B" visited the same caves. The organisers are very appreciative of FUSSI and CEGSA members who made themselves available to take delegates caving.

In Starburst Chamber, Victoria Fossil Cave.
Photo: John Brush

The ACKMA family gathered in the Naracoorte Town Hall on Sunday evening. The Hall was the central point for all talks and most meals, plus the wonderful *Sixteen Legs* exhibition. After convener Deborah Carden welcomed delegates, Ian Lewis and Ken Grimes provided a "geographic and geological" context.

On Monday morning, president Dan Cove opened proceedings and introduced Craig McGuire, Deputy Mayor Naracoorte Lucindale Council who welcomed delegates to the town. Department of Environment, Water and Natural Resources (DEWNR) CEO Sandy Pitcher provided a departmental welcome. Following these, we had the usual ACKMA conference scene setting by our hosts. Deborah Carden and Nick McIntyre, DEWNR, outlined the administrative arrangements for Naracoorte Caves with *'Caring for Country' - Naracoorte Caves National Park and World Heritage Area (NCNP WHA) management and governance.* Executive Officer for the World Heritage Site, Amy Macken followed this with *Australian Fossil Mammal Sites - Naracoorte and Riversleigh - fulfilling World Heritage obligations.*

Rod Wells and Liz Reed then gave an overview of 45 years research at Naracoorte. For those who had never heard the Naracoorte story Rod was, as usual, inspiring, and

for those who had, the recent work led by Liz Reed provided plenty of interest.

Monday afternoon was a field trip to Naracoorte Caves. Rod and Liz delivered commentary at their respective research sites, Victoria Fossil Cave and Blanche Cave, supported by DEWNR guides at Wonambi Fossil Centre and the Bat Centre. All delegates were asked to be seated by 5.00pm in Blanche Cave for a special event. A few of us were aware of the event (as the photographer I needed to know!) but most were truly surprised to find themselves at a wedding. Andy Spate and Kirsty Dixon exchanged wedding vows in Blanche Cave with the ACKMA family in addition to their own. This was a first for an ACKMA conference.

Rod Wells with Sthenurine kangaroo skeleton in Victoria Fossil Cave.
Photo: Steve Bourne

The *Sixteen Legs* exhibition was introduced by the newly married Andy Spate Monday evening. Andy had visited the exhibition in Hobart and suggested to Deborah and me that it would be great to bring it to ACKMA. With the support of the Friends of Naracoorte Caves and Naracoorte Lucindale Council, funds were provided to Niall Doran to assist with covering the cost of transport. Getting it to the mainland, and getting it set up in the Town Hall was a great effort by a number of people.

Tuesday was an all day field trip to the Mount Gambier region, visiting Princess Margaret Rose Cave on the Glenelg River cruise, Piccaninnie Ponds, Hell's Hole, Pick Swamp, Ewens Ponds and homepast Mt Schank. The karst features in the area are quite different to what most ACKMA members have at their home sites and the day was enjoyed by all.

Wednesday was a half day papers and half day field trip to the Sand Cave block and Bool Lagoon Game Reserve. I unfortunately missed this day, but once again, feedback from delegates was positive.

I made it back from Adelaide to attend the evening meal and after dinner talk by Naracoorte Lucindale Council CEO Helen Macdonald. Helen's talk was about partnerships and reflected on her time in Ghana, and some important lessons for partnerships in Australia.

L-R. Ian Cathles, newly weds Kirsty and Andy, Helen Cathles in Blanche Cave.
Photo: Steve Bourne

ACKMA AGM

The AGM was held Thursday morning. Nominations were received for all positions except president. Nominations were called for and Dan Cove accepted to stay on for another year. The ACKMA committee is now:

Dan Cove	President
John Brush	Australian Vice President
Neil Collinson	New Zealand Vice President
Dave Smith	Executive Officer
Sasa Kennedy	Committee
Cath Loder	Committee
Tim Moulds	Committee
Grant Gartrell	Treasurer
Steve Bourne	Publications Officer

The locations for future AGMs and conferences were discussed with the following proposed;

2016 Capricorn Caves, Queensland
2017 Auckland , New Zealand
2018 Wombeyan Caves, New South Wales

The Cave Guides Workshop will be held in conjunction with the Capricorn Caves AGM meeting as it was in Mole Creek Tasmania in 2004 and Yarrangobilly Caves in 2014. This provides some efficiency in that only one host site is required each year and allows for some cross over in attendance.

Following the AGM, we once again boarded the coaches and headed south, this time to Tantanoola Cave and the adjacent Sibelco Quarry. It was my first visit to Tantanoola Cave since the LED lights had replaced the dichroic lamps. the LEDs put out much more light and most agreed that the cave now needs less lights than were previously in place. I had wondered how LEDs would look in this cave, but the colour temperature selected is good and cave looks good. One challenge in this highly decorated cave is minimising the impact of light fittings on what the visitor sees - a very challenging task.

ACKMA members in Tantanoola Cave.
Photo: Steve Bourne

The challenge of disguising light fittings when there is no where to hide them.
Does it matter? Tantanoola Cave.
Photo: Steve Bourne

After the cave and quarry visit, we travelled to the "Main Corner", the excellent visitor centre in Mount Gambier. Here we were given a welcome to country and discussed Indigenous culture and conncetions, and viewed the excellent film *Volcano,* which tells the story of the eruptions that created Mount Gambier.

The conference dinner was held on this evening at "The Barn", a restaurant renowned for its excellent steak. It did not disappoint on this occasion either. DEWNR Regional Manager Tim Collins was the dinner speaker and did an excellent job, but was upstaged by a very humorous Mount Gambier Mayor Andrew Lee.

All too soon Friday arrived. Does time speed up for an ACKMA conference? The morning paper session included two papers exploring the role of ACKMA and included a short workshop on ideas for lifting the profile, relevance and attractiveness of ACKMA to enlist new members and retain current membership. There is still work to be done and the committee would be very pleased to hear what you think about how ACKMA is operating and what can be done to improve our association.

On Friday afternoon, we ventured to Elderslie Quarry, the site of the non-caving trip earlier in the week. Members were able to collect a few marine fossils as souvenirs and save them from being crushed as road base, with one particularly fine specimen saved for the evening auction.

The Wrattonbully Grape Growers hosted us in Schultzs Cave. This cave was known by early settlers, but had its entrance blocked around 1918 according to local knowledge. During vineyard development in 2000, a bulldozer exposed the entrance once again. Vineyard managers Ken and Helen Schultz developed half of the cave with footpaths, steps and lighting, including a carved rock table, wine rack and rock seating for functions. It is used by the vineyard owners as a tasting room to impress wine writers, sommeliers and regular journalists, and sparingly as a function room, primarily for local fund raising events. I have attended several of these, and while I cringe at the dropped food and wine on the cave, it is certainly a memorable experience to wine and dine underground. ACKMA members managed to cast aside reservations and enjoyed sampling Wrattonbully wines and a powerpoint presentation by Treasury Wines Vineyard Manager Tim Fletcher.

The final dinner was held in the Town Hall, for which I was the Master of Ceremonies. The meal was followed by an outstanding talk by Prof Richard Mackay. Richard is a member of the Australian World Heritage Advisory Committee (AWHAC), and previous board member of the Jenolan Caves Trust. He operates a heritage consulting business and has completed some outstanding work in the field of World Heritage. I really enjoyed his expertise during the time I spent on AWHAC and ACKMA members were really privileged to have Richard attend the entire conference. Richard's keynote presentation was titled *Heritage values: Immutable or carved in stone?* It was an excellent presentation that included advice on how you could claim condoms as a tax deduction. The things you learn at an ACKMA conference!

An auction was held of various items donated with the large fossil shell recovered from the quarry making $60 - nice buying Dirk Stoeffels! Purchasers of items had the choice of directing their money to either Niall Doran's Bookend Trust or the ACKMA Life Members Fund. Most people split the money and over $500 was raised for each cause.

I took a few hardy souls on one last caving trip into Cathedral Cave on Saturday morning.

The conference attracted a smaller number of delegates (about 60) than the previous six conferences. Of these, only a small number are actually directly involved in cave and karst management. It did not impact on the conference though, which was well planned and coordinated by Deborah Carden and her team. The Caves Cafe team from the Naracoorte Caves National Park prepared the majority of the meals and did a fine

Dining in the Town Hall with the Sixteen Legs exhibition in the background. Photo: Steve Bourne

Niall Doran introducing Sixteen Legs exhibition. Photo: Steve Bourne

ACKMA members enjoying an afternoon tea of Wrattonbully wines and nibbles in Schultzs Cave, near Naracoorte. Photo: Steve Bourne

job. The Caves staff also looked after the bar and did an enormous amount of work contributing to the successful event. Very pleasingly for treasurer Grant Gartrell, the conference made a small profit despite very little financial sponsorship. This is a credit to the Department of Environment, Water and Natural Resources which provided staff time and undertook so much of the work themselves.

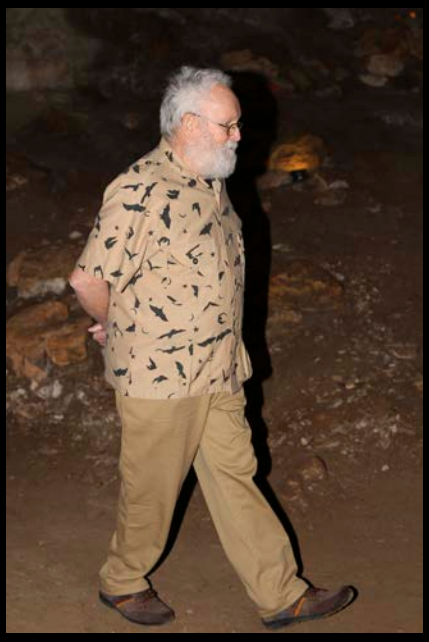
A limerick from the conference dinner for Andy Spate and Kirsty Dixon

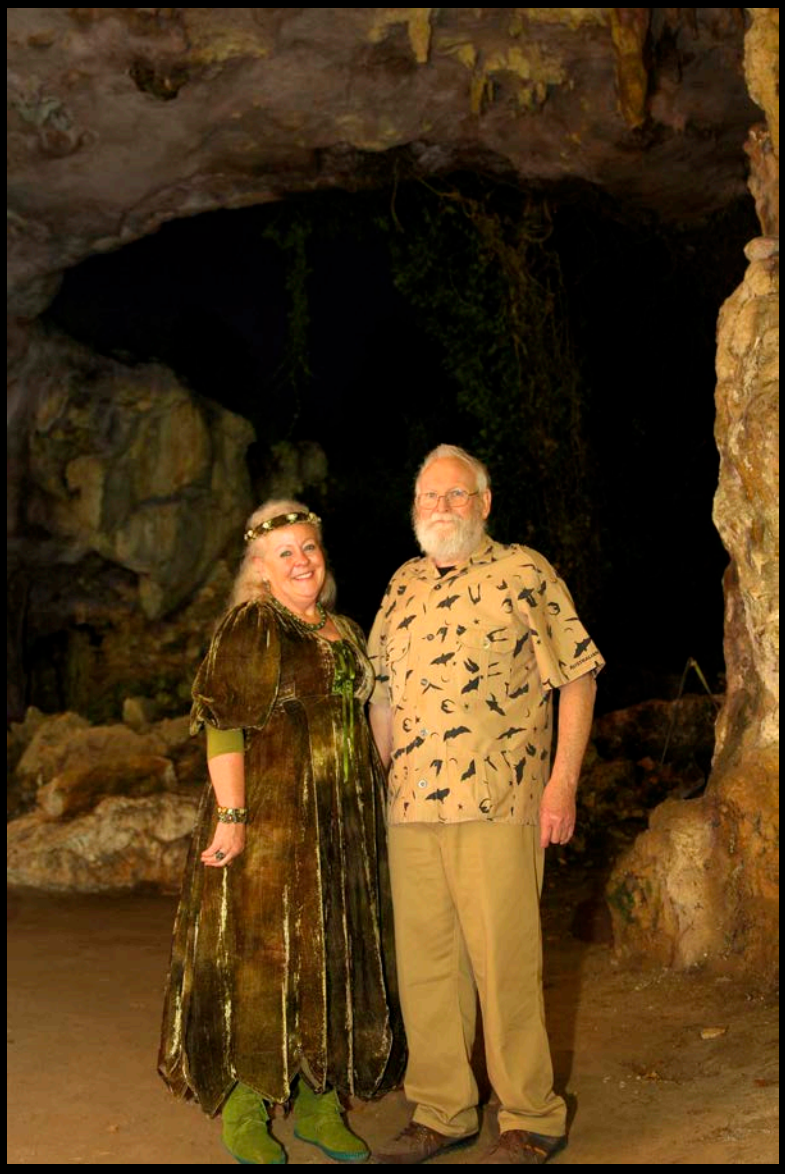
There is an old caver named Andy,
Who when in the west was randy,
But in Naracoorte,
He did what he ought,
A wedding, now all's fine and dandy!

BACK COVER: 2015 ACKMA Conference delegates

Seated L-R. Miles Pierce, Julia James, John Brush, Ann Augusteyn, Mary Trayes, Deborah Carden (Convener), Dave Smith, Katrina Wills, Cathie Plowman, Judy Chistensen.

Standing L-R. Niall Doran, Brett Farquarson, Sasa Kennedy, Graham Pilkington, Amy Macken, Peter Chandler, Andy Spate, Savannah McGuirck, Ted Richards, Carl Taylor, Marjorie Coggan, John Ash, Lily Petrovic, Dan Cove, Dirk Stoeffels, Greg Martin, Rauleigh Webb, Sam Webb, Tim Moulds, Cath Loder, Amanda Hilton, Kirsty Dixon, Grant Gartrell, Richard Mackay, Regina Roach, Judith Dixon, Tim Featonby, Rhonwen Pierce, Rosemary Hatfull, Josh Fisher, Robert Tahi, Ruth Lawrence, Steve Bourne, Ken Grimes, Dale Calnin, Kevin Mott, Anne Musser, Nick Heath, Pat Culberg, Tony Culberg, David Butler, Barry Richard, Lisa Brooks






Certificate of Marriage
Andrew Philip Slade
Kirsty Jean Dixon
Eleventh
May
2013

SIXTEEN LEGS
ENTER THE CAVE
EXHIBITION