

# CAVES

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December 2006

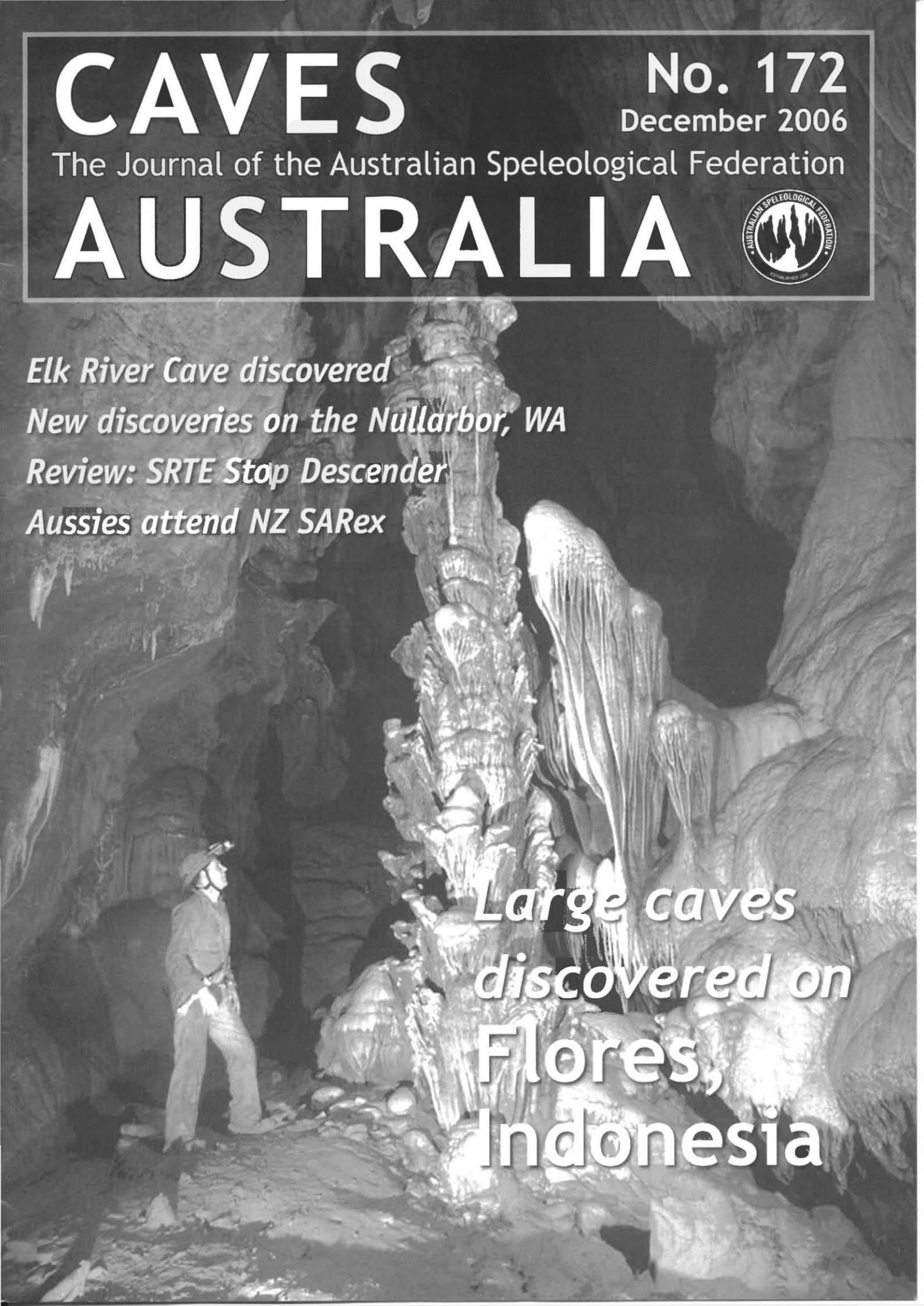
The Journal of the Australian Speleological Federation

# AUSTRALIA



*Elk River Cave discovered*  
*New discoveries on the Nullarbor, WA*  
*Review: SRTE Stop Descender*  
*Aussies attend NZ SARex*

*Large caves  
discovered on  
Flores,  
Indonesia*





## Coming Events

In particular, this list will cover events of special interest to cavers and others seriously interested in caves and karst. This list is just that: if you are in

(Chair of the International Commission) on [nicholaswhite@netspace.net.au](mailto:nicholaswhite@netspace.net.au). If you plan to visit North America or Europe, we can probably also provide details for some of the local-regional meetings that take place there.

### 2007:

- October 8-12 National Cave & Karst Management Symposium — St. Louis, Missouri
- October 27 NSW Caver's Dinner at Bankstown Sports Club. Contact Joe Sydney: [jsydney@choice.com.au](mailto:jsydney@choice.com.au)
- October 28 NSW Speleo Council meeting at NSW Cave Rescue HQ, Klemm St, Bankstown
- October 16-19 TIAC'07 — 3rd Symposium on Technology of Seawater Intrusion into Coastal Aquifers, and 2nd Conference on Coastal Aquifers and Desalination Plants, Almería, Spain
- November 17-18 Journées 2007 de Spéléologie Scientifique, Han-sur-Lesse, Belgium.

## 2008

- January 27 ASF Council Meeting, Bankstown Grammar School, Sydney (see pg 2).
- February 10-15 13th Australian and New Zealand Geomorphology Group Conference Western Tasmania.
- March 1 VSA 40th Anniversary Dinner (see pg 5).
- May USGS Karst Interest Group Workshop, Bowling Green, Kentucky, USA.
- May 2-4 SUSS 60th (see pg 2).
- May 16-18 ACKMA Annual General Meeting. Capricorn Caves and the Mt Etna Caves National Park.
- August Inaugural Global GeoTourism Conference, Esplanade Hotel, Fremantle WA.
- August 23-30 VERCORS 2008 - European speleological gathering, including IVth European Speleological Congress, Lans-en-Vercors, Isère, France.
- September 19th International Symposium on Subterranean Biology, Western Australian Museum, Fremantle WA.
- September 11th Multidisciplinary Conference on Sinkholes and Karst, Tallahassee, Florida, USA.
- September XIIIth International Symposium on Volcanospeleology, Jeju Island, Korea.

## And Looking Further Ahead

### 2009 and beyond

- January 27th ASF Conference Gippsland Victoria
- May ACKMA Conference, Margaret River, W. Aust.
- July 7-12 ANZ IAG Int. Association of Geomorphologists Conference, Melbourne
- July 19-26 International Congress of Speleology, Texas, USA



### SUSS is 60!

2nd - 4th May, 2008

You are invited to a celebration of all things SUSS. Come and celebrate our birthday in style at Jenolan Caves with a weekend of caves, fine food and wine, caves, talks, caves, walks, caves, displays, caves, yarns, caves, old cavers and caves! Stay at historic Caves House, soak up the atmosphere, and celebrate at the formal dinner on Saturday night, 3/5/2008. Visit wild caves, visit the show caves, or take it easy on the balcony. <http://ee.usyd.edu.au/suss>, PO Box 35 Holme Building Sydney University 200

#### Details, details.....

Who do I contact for bookings?  
We've arranged accommodation packages with Caves House  
I can't wait!

Neither can we.

The following packages are per room per night twin share (2 night stay):  
Cost per extra adult - \$30, extra child \$20



2008

#### Caves House

- Classic 2 room Suite \$265
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- Grand Classic \$165
- Classic \$145
- Traditional (shared facilities) \$85

#### Mountain Lodge

- Studio Unit \$120
- Interconnecting 2 Room Unit \$205

#### The Cottage

- 3 bedroom cottage unit \$270

#### The Gate House per person \$30

#### Jenolan Cabins \$150

Weekend Meal Package \$150 per person

- Welcome supper Friday evening
- Pre-dinner drinks with cocktail snacks
- Saturday dinner with beverages
- Breakfast Saturday and Sunday

Contact Caves House for bookings - make sure you let them know you are with SUSS.  
Phone 1300 76 33 11, press 1

<http://ee.usyd.edu.au/suss>, PO Box 35 Holme Building Sydney University 2006

**SUSS contact:** Keir Vaughan-Taylor  
[keirvt@optusnet.com.au](mailto:keirvt@optusnet.com.au)

### ASF Council Meeting

27 January 2008



**VENUE:** Bankstown Grammar School  
53 Georges Cres (Haig Ave)  
Georges Hall, NSW.

Clubs are invited to attend the next ASF Council meeting to be held in Sydney. Clubs are also reminded that if they cannot attend that they should arrange for an attending club to act as proxy.

Minutes of previous meeting and agenda have been circulated and are available from the ASF Secretary on request: Winfried Weiss [wmweiss@westnet.com.au](mailto:wmweiss@westnet.com.au)

For more information visit the ASF website: [www.caves.org.au](http://www.caves.org.au)



## CAVES AUSTRALIA

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Editorial contributions are welcome! For contributor guidelines, contact the Production Manager.

### Advertising

Contact the Production Manager for commercial, caving community and classified rates. Rates start from \$5 to \$400 for full page B&W back cover. Discounts apply for placements of 4 adverts and an up-front payment.

### Issue Dates

March, June, September and December

### Magazine Subscription

Journals are included within ASF membership fees. Subscription to magazine is also available to non-ASF members at \$25.00 including postage within Australia for one year (four quarterly issues).

Change of address. Notify us immediately of any address changes to ensure your delivery of *Caves Australia*.

## ASF Executive

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Vice President:	Nicholas White
Treasurer:	Grace Matts
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Executive Secretary:	Evelyn Taylor
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## Caves Australia

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COVER: Garry K Smith next to Cadi Prambanan in Liang Luar, Flores Is, Indonesia.

Layout and design: Jacqui Fry

## HELP SUPPORT ASF

The Federation is run solely by subscription to ASF. Your donation or bequest will assist our work in lobbying to save karst, ensure continued scientific projects and more. To make a contribution or receive an information pack, contact The Secretary or visit [www.caves.org.au](http://www.caves.org.au)



# CONTENTS



## President's Report

I hope that all of ASF members are going well. I'm sure that those who were able to attend the ASF conference will have many great memories. There was a wide range of activities, many interesting papers and great opportunities for networking!! If you've got some photo's of the week or any comments - I encourage you to send something in for publication.

I'd like to thank the ASF Conference organising committee for all the hard work that they put in to arrange the conference. Special thanks also to the sponsors of the events, in particular the SA Department of Environment & Heritage. We really appreciated the time that Steve Bourne (Naracoorte Caves Manager) and staff took to facilitate the field trip day at Naracoorte - allowing ASF members to visit a wide range of caves. The BBQ and social event at the end of the day was enjoyed by all. The ASF executive has had excellent feedback regarding this day, the facilities and the staff involvement. Participants really enjoyed the caves, the site and the interpretation provided. Thanks also to other sponsors - the SA Department of Tourism, Limestone Coast Department of Tourism, Mt Gambier City Council, District Of Grant Council and the Scout Outdoor Centre.

During the conference, the ASF held its Annual Council Meeting. It was excellent to see members and club representatives engaged in discussion and decision-making on a wide range of topics. I hope that your club members who attended have provided feedback on the key issues that were discussed. In particular, some changes were made to the insurance and suggestions made for the future progress of the ASF and the Environment Fund. Although the Insurance costs have been reduced, the ASF still has significant operational expenses. The membership fees have been set to remain at their current level - in order to cover the costs. Many members may not realise what is involved in running an organization such as the ASF and some more information will be coming in later Caves Australia on this matter. If this is an area that you are concerned about, please do contact me to discuss this further.

Some members have also asked about the status of the ASF Standards such as the Code of Ethics (also known as the Code of Conservation and Ethics). We would like to undertake a review of these documents and need members who are interested in assisting with this. In the meantime, however the Codes are in use by all of our members. In particular, I'd like to take the time to ask members to re-read these documents and to refresh your memory on various aspects to consider when you are "out there caving". I would like to reiterate that ASF members have great respect for managers and for the sites that they manage. I'd particularly like to remind members that when on private property or managed State reserves or Parks, that managers' and owners' instructions need to be observed closely. This is not just in relation to access arrangements, but in relation to protection of sensitive sites - whether that be a cave or a part of a cave. We all have a responsibility to act to protect the special places that we visit.

For example, prior to undertaking a cave excavation, or dig, it is important to liaise with the landowner and/or management authority. Likewise, liaison is important, particularly if you are undertaking conservation projects or other "work" in a cave. Consideration of aspects such as the interference of the karst system, altering hydrology and an assessment of the environmental effects would need to occur. I'd like you to think about your practices when caving and what is a priority for you.

The ASF is pleased to be able assist others who can make use of our Standards and Codes of Practice. For example, the Minimal Impact Caving Code (MICC) has proved very important as a Code to minimise damage underground by cave visitors. We have encouraged its use by Management Authorities in management plans and in cave access permits throughout Australia. Members may not realise that our Codes are used in other countries and known to cavers in other countries.

I hope that you have all had a successful year, and I hope to hear from you about some of the issues that you feel are important.

Yours in caving  
Jay



### FROM THE EDITOR

Thank you to the readers of Caves Australia for your patience in waiting for Issue 172 to be released. I am sure you enjoy the great range of articles and frank reviews included in this issue.

Issue #173 is almost fully constructed, as it is a compilation of 50 years of Australian Speleology history and highlights from the XXVth ASF Conference. Contributions for #174 are open and filling fast.

Future issues of Caves Australia will see the reintroduction of "Down Under All Over" a dedicated column on the events and issues affecting individual clubs, and the inaugural column "Conversation on Conservation." I hope that you will enjoy sharing your experiences with us.

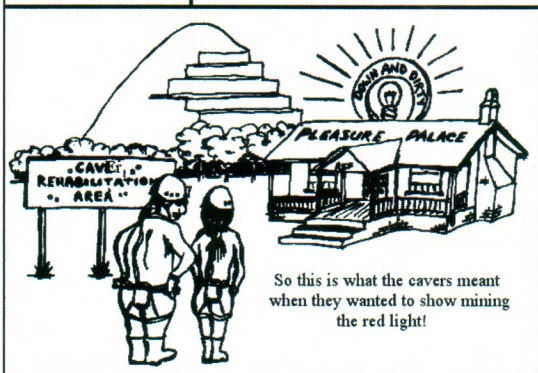
Regards  
Ed.

### WANTED ARTICLES FOR CAVES AUSTRALIA!

Whether caving, cave diving or a general exploration, Caves Australia readers are interested in YOUR story. It is only with YOUR contribution that we can produce a quality magazine for all to enjoy.

For writing and style guidelines, contact the Editor or Production Manager for further information.





ASF Conference deliberations on effective fundraising to sustain the Mt Etna Property.  
(Anonymous artist impression donated by S Bunton)



## Help Save Australian Caves & Karst

A gift to the ASF Environmental Fund is an investment in Australia's future.

Karst and caves, clean alluvial water, fertile soil, beautiful vistas, rich forests, abundant plants and wildlife, and most importantly our true "common wealth". Conserving our natural beauty whether under or above ground is our priority.

With your donation to the Fund our participating projects can continue their good work in protecting karst. You will join a group of caring people who are working for a brighter future for everyone.

Make a donation to the ASF Environmental Fund for Karst now and help keep our karst a great place for all to enjoy!

## Helictite

Vol 39 (2) 2006 *OUT NOW!*

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Proceedings of Limestone Coast 2004

Editorial — Ken Grimes

Syngenetic Karst in Australia: a review

Seasonal Karst Lake Cerknica (Slovenia): 2000 Years of Man Versus Nature

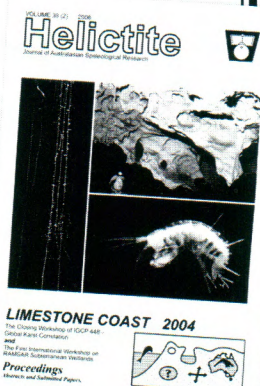
Environmental Reconstruction of Karst using a Honeysuckle species widely used in Traditional Chinese Medicine

Thinking about Karst and World Heritage

Abstracts from the "Limestone Coast 2004" conference

Papers from other karst journals from around the world

For more info about Helictite, visit:  
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## VSA 40 YEAR ANNIVERSARY

VSA was formed from the Sub Aqua Speleological Society and the Victorian Cave Exploration Society forty years ago. To celebrate the occasion we have planned a dinner in March. We invite the wider caving community to help us celebrate.

If you know any old VSA, SASS, VCES members please pass on the following information.

### VSA 40th Anniversary Dinner

Saturday 1 March 2008

7-ish start.

Upstairs at Cooper's Inn

282 Exhibition Street (Cnr Exhibition & Little Lonsdale Streets), Melbourne 3000.

[www.coopersinn.com.au](http://www.coopersinn.com.au)

Come and celebrate 40 years of VSA and 50 years of organized caving in Victoria.

We would like to see as many old members and friends of VSA, Sub Aqua Speleological Society and the Victorian Cave Exploration Society as we can.

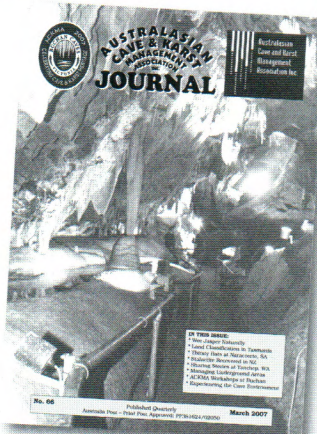
The program being planned is short talks about formative events in SASS, VCES and VSA; displays of interesting items and pictures. There will be opportunities to catch up with old friends and talk about caving and VSA. The formalities will be indispersed with a three course meal.

The expected cost of the meal, pre-ordered, will be about \$25 and there will be a bar with reasonable prices. There is ample parking undercover in the vicinity. Hope to see you there and pass this information on to anyone who may be out of contact with VSA.

Replies by 15 February 2008 to [akariko@optusnet.com.au](mailto:akariko@optusnet.com.au)

## Inside March ACKMA 2007

- Land Classification and Tasmania's Karst Estate
- President's Message
- Stalactite recovered by Neil Collinson
- Thirsty Bats
- Wee Jasper Naturally
- Sharing Australia's Stories at Yanchep
- Experiencing The Cave Environment
- Management Of Underground Protected Areas
- Responding To Change In Cave Management
- Book Review by Andy Spate



For more info about ACKMA, please visit:

[www.ackma.org](http://www.ackma.org)



# NZ SAREX - NZ Search and Rescue Exercise

*24 hours from Perth — 14 hours underground - and worth it*

by Ross Anderson

ASF National Cave Rescue Commission, Convenor

Sunday 28th of February, 1AM Christchurch International Airport ...

A caving I will go,

A caving I will go,

A caving I will go ....NOT ....

Singing songs was not at the forefront of my mind after three flights over 24hrs from Perth to Christchurch. My jet lagged, time-zone altered, knackered brain was saying only one thing. Sleep, sleep, sleep .... so along with about thirty others I lay down on the floor of the airport and passed out ...

So started my visit to the 2007 NZ SAREX (Search and Rescue Exercise) hosted by LANDSAR NZ and held just out of Nelson in the north of the South Island.

Depending on whom you talk to, between 50-70 cavers turned up for the exercise at Ellis Basin on the flanks of Mt Arthur. The SAREX ran for 2 1/2 days and saw the NZ police, LANDSAR (read SES), NZ Royal Air Force and NZSS cavers work together to raise an injured caver 350m vertically through a series of 10 pitches and several hundred meters of breakdown passage.

Joe Sydney and I were the token Australians for the exercise. Initially we expressed an interest in observing the command system and descending about half way down the cave. This plan went out the window when Sarah Brewer asked if I could assist with delivering the stretcher to the patient — "yep not worries Sarah, I'll go down for you!"

So hurried final preparations and onto the NZRAF helicopter (one of two the NZRAF owns; this one even flies!!) and up to the entrance of Tomo Thyme cave. The first pitch was 47m and a great start to an awesome trip. Down pitch after pitch after pitch, down the Wiggly Woggles, up the Cresta Run and through the Kortakay and down the Pendulum — mate, I was glad to see that my team mates Julian and Frog were also sweating in this 7°C cave. Finally after four hours of transit time we were at our pitch to rig and we lowered the stretcher to the medic and Team 1.

Not far behind us was the communications team and behind them several rigging teams each clearly allocated a pitch to rig for the upcoming stretcher. Dual ropes were used for every pitch with the safety / belay line being red to minimise confusion. Clear calls and many hands on the haul system was the plan. Pitch 11, Pitch 10, Pitch 9 — time to depart, too many hands meant bottlenecks and downtime. Another four hours to exit the cave and a total of 14 hours underground.

Tomo Thyme cave was selected for this exercise due to it being a hard alpine cave requiring technical rigging; representative of NZ deep caves. Pitches, required cavers to travel through loop traverses, rebelay and slots whilst under suspension. Rigging for the



**Joe Sydney working out how to retrieve the most expensive sleeping bag in the world after it fell out of a helicopter.**

lifts were required to be bomb proof, with natural, pro and drilled anchors used. Unfortunately, even with the high skill levels and experience available Pitch 5 had to be abandoned due to an anchor becoming unstable during a lift. Pitches 3 and above were not attempted due to time constraints.

To keep tired cavers fed and watered, the nearby Ellis Basin hut was provisioned with food, cooking staff and camp helpers to erect tents for weary cavers. All the cavers had to do was walk the 45 minutes from cave to camp, eat and fall asleep.

Typically with cave rescue, no matter how large the cave exercise, personalities and communications were identified as limiting factors in the exercise. Additionally bottlenecks at pitches due to single rope rigging, made the passage of cavers and equipment into and out of the cave less efficient.

Interaction between statutory authorities and volunteers was a highlight for me, gaining an insight and clearer understanding of how Australian cavers generally are falling down in cave rescue organisation and recognition. Valuable experience was gained, contacts made and all in all a very worthwhile trip was had. ■



**Stephen Swabey - NZSS Pres at debriefing cavers.**



**Cavers waiting for their ride back to base.**



# Elk River Cave Discovered

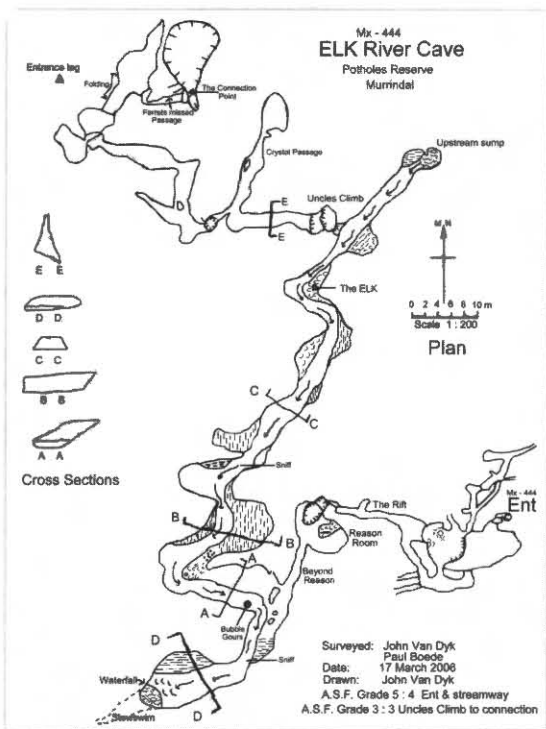
3 - Mx - 444, unexpected discovery of an underground river at Murrindal, Victoria.

Kim Van Dyk (VLCT)

There is an Old Italian saying, "Dove non si credo l'acqua rompe" which translates to "Where least expected water breaks forth" and so it was with this cave. When we first entered in March 2006 we expected to find another typical Potholes cave. We did, but then it all changed. To find an underground river in The Potholes was completely unexpected and something beyond our wildest dreams. The later connection to another Potholes cave just added to our amazement.

Exploration by: Laurie Brown, Eric Munro, John Van Dyk and Kim Van Dyk

Guest appearances by: Paul Boede, Peter Freeman, Stewart Germon and Joshua Van Dyk



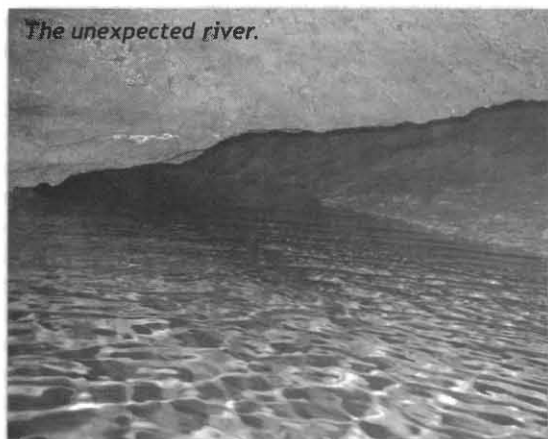
## Survey plan.

There was a miniature hurricane emitting from the crack. After an hour or two of moving things we had an enterable cave with a howling draught but had run out of time. A few weeks later we were back at the entrance. I jumped in, in civies, light in hand. It went, so I yelled out that I was heading down and for them to follow. By the time Eric caught up with me I had worked through the rockfall and rift and had had a quick look round the chamber. He said we were IT for the underground team so we took off having a good look around. We were stopped by a pitch. Stone travel indicated it was pretty deep. We couldn't see a bottom due to a ledge about 25 metres down. (The survey showed the pitch to be 31 m deep). We exited to get the vertical gear entering an hour later, this time with Laurie and 7 packs.

While Eric and Laurie were rigging the pitch I was putting my vertical gear on so, over an hour later, when the pitch was rigged I was first in line, being the only one ready to go down. The pitch starts as a squeeze with a right angle bend in it before opening

up into a continuation of the rift we had entered from. I free-climbed down the drops in the rift removing the ladder piles on each of the ledges to the pitch proper. The ladders had nicely gone over the first small ledge on the pitch but had hit a second larger ledge and piled into a heap. I fixed the ladder problem and secured myself while Eric descended down to the ledge I was on.

Back on the belay line I continued down to a floor where the cave, instead of dead-ending as I expected it would, had a lead off it. I called up to Eric that I was going to push the lead and he could stay up or come down. He decided to come down and I set off. The squeeze over a fallen slab of rock opened up into a descending, mainly walking height rift. I continued down the rift to where there was a small rockfall. When I first saw the water through the rockfall I thought I'd reached a puddle at the bottom of the cave. I almost turned around then and there but thought I'd better push right to the end - just to be sure. I moved forward another half a metre and there it was - a flowing river. I began screaming out to the others. I needed someone else to see what I was seeing. There were no rivers under the Potholes - but I was under the Potholes and it was a river. I could hear Eric working his way closer and I sat watching the river with tears streaming down my face.



The unexpected river.

Eric: I was just starting down the final section of the ladder climb when Kim began yelling out. She was screaming for Laurie to come down and we'd found a river. She either had sustained serious head injuries or we'd made one hell of a discovery. I yelled up to Laurie and continued down. The lead Kim had taken was pretty obvious. It was the only lead. I grunted through, glad it quickly opened up and followed the rift. Kim was sitting on top of a small rockfall with a glow so bright she didn't need a light. I climbed up to her and looked down. Shit, it was a river. We just sat in quiet awe waiting for Laurie to reach us.

Laurie: As I hurried down to see it for myself I couldn't help but think of all the piss ant things that cavers call rivers or lakes in caves. I don't know quite what I expected but it wasn't this. This was a river. A real, actively flowing river.

Downstream we could see a long, wide, roof sniff that appeared to open up but upstream looked more inviting (no roof sniff and easy walking passage). We

Elk River Cave

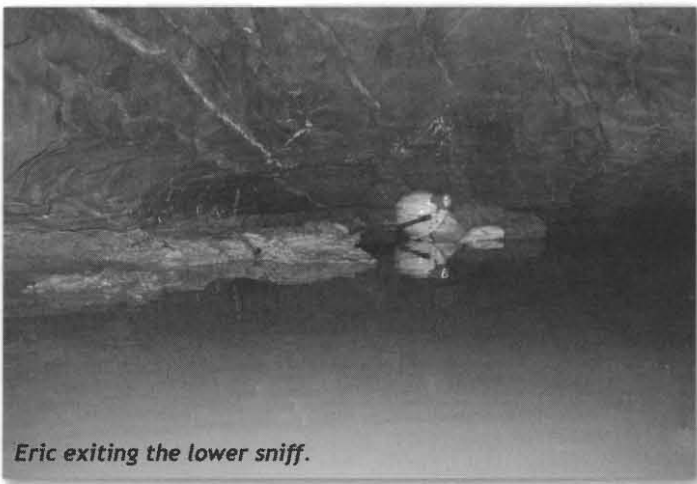


waded and wallowed and crawled in the river for about 40 metres until we encountered a serious looking roof sniff. We were not expecting to be wet caving and were all feeling the cold so turned back and exited the cave. We left the cave rigged, knowing we'd be returning the next day.

This time John was with us. Even with bad back pain he had to see for himself the river that we'd been raving about all night. This time we brought abseiling devices so the trip down the pitch was a lot faster and easier. Again we all sat for quite a while just watching the river happily flowing away.

*John: I expected a trickle flow and was stunned to see that they hadn't been exaggerating. It was an actively flowing river and we were under the Potholes. I am both miserable and elated walking along the passage. This is truly amazing - but I'm going to have to survey it all. With cave explorations if you don't survey you don't know where you've been. Surveying is slow, tedious and no one wants to do it but it just has to be done so as a democratic group, the others all vote that I do it. I hate surveying. I hate surveying in tight squeezey bits and rockfalls and down pitches. I particularly hate surveying in mud and water. Why do I have to ruin what could be a perfectly pleasant cave trip by carting and using this crap survey gear. Gloves off, gloves on. Unpack survey gear, repack survey gear. Getting a shot through a sniff. Read numbers. Write numbers. Eye strain. Drips in my ears. Near hypothermia 'cos I have to move slowly and stop all the time, it's all bad. Did I mention I hate surveying?*

Eric took the plunge and headed through the downstream sniff. He came back reporting that the river fell over a waterfall into a sump. Upstream we reached the roof sniff. Again Eric gave it a go. As he was fully wet and the rest of us still had the top half of our chests dry we let him go. He headed for the space with the most air and was able to get his head through the sniff but the rest of his body was not able to follow. Backing back he aimed for the next of the three air spaces. This one opened up and he was through. He called out that the passage continued and we let him go solo for a quick look. Why should all of us get fully wet if it was going to sump after the first bend? Eric returned really suffering from the cold.

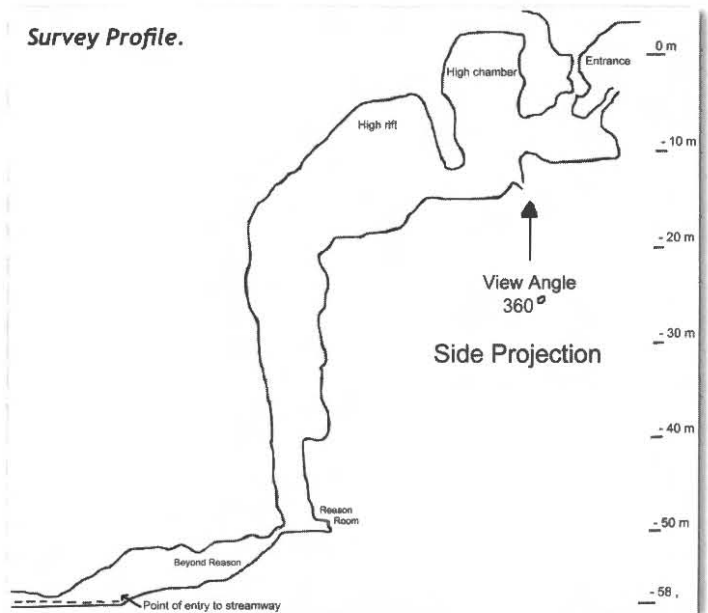


**Eric exiting the lower sniff.**

Don't ask why because I can't think of any logical reason, but although we knew we were heading into an active river cave, where full immersion was going to be required, we didn't come dressed for the occasion. All of us were in our regular trog gear. Perhaps it was the pure excitement of what we'd found and we just forgot or perhaps it was because although three of the four of us had already been in the river we still didn't believe that there really was a river under The Potholes. Eric reported about 50 metres more of passage before the cave sumped but there was an aven just before the end that looked interesting. He also mentioned seeing a very strange speleothem.

The next trip Eric and Laurie and I carted all the packs to the top of the pitch while John and Paul started the survey. I left the guys to rig the pitch and took off to take photos of the upper passages and

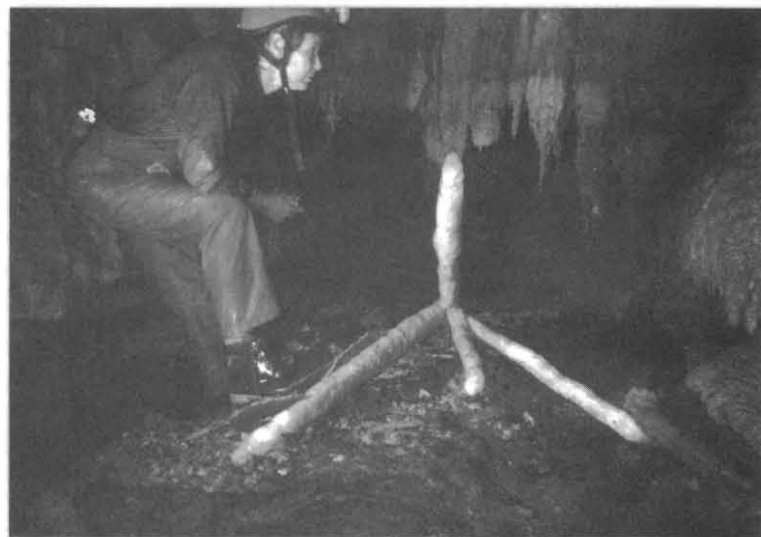
### Survey Profile.



rift. This time we had come prepared for the cold, wet conditions and changed into thermals and wetsuits in The Reason Room, as we had now named the room at the bottom of the pitch. We all met up and Eric led through the sniff. I was next. I lay back, ears under, face out, and took a nice calming breath preparing to glide slowly up to and through the really low bit. Splat. Something wet landed on my face. I backed up as fast as I could with this 'thing', whatever it was, still there. It was a frog. With the frog placed on the river bank I tried again, this time with no unexpected hitch-hikers. The others made it through and we again separated. The 'climbers' headed off quickly followed by me snapping away and pulling up the rear came the surveyors.

There was no missing the strange speleothem. It was bigger than Eric described it. We later named it The ELK. The survey was completed from the entrance to the upstream sump before John's eyes finally gave out. He later calculated that we had 175 metres of river passage and had 58 metres of vertical depth from the entrance. I headed out earlier than the guys with Paul seeing me safely through the sniff before heading back to the others. They managed the climb with relative ease and a second climb that followed it but a third climb eluded them.

The next trip was to push Uncles Climb. The climb is up massive ancient gours, some more than 3 metres high. A grappling hook was taken in and, after many attempts we finally got it to hold. With John assisting from below Laurie made the first ascent. It was not easy physically or mentally. If the hook let go (quite possible) and John couldn't hold him (highly probable) he would have a fall of 9



**Kim & The Elk Antler - and carrying out stream survey.**





*Ancient streamway.*

metres. Laurie secured a belay line and with John helping me from below I made it up. We left John and headed up a steep dirt banked passage that appeared to end in a solid wall. The only way on was under a small (about 30cm high but after the giant sized gours we had just climbed it seemed small) gour that filled the passage width and left about 5cm between the top of the gour and the ceiling. We crawled under and it opened out into a near horizontal, ancestral streamway. Where the floor was not flowstone it was dry, deeply cracked sediment. The walls were highly decorated with calcite and gypsum speleothems. The discovery of the gypsum was almost as surprising as the discovery of the river. It presents as selenite needles, gypsum flowers and coatings. The passage ended in a sediment choke. We headed back and chimney climbed up into a small, inclined chamber. We both prodded and poked but could not find the way on. We left the climb rigged for the next trip.

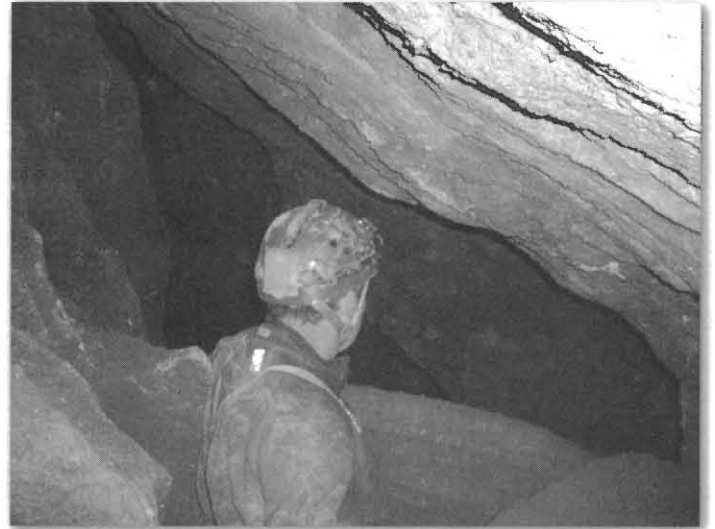
The next trip was to push Uncles Climb further and survey it. The route on was found (Laurie and I missed the obvious) and the guys followed it up a series of climbs, chambers and passages eventually stopping at another climb. The survey was showing something very interesting. We had already passed under passages of another known cave. We had a survey of both caves and we had plotted it all out on the surface. We planned for a connection trip.

The objectives of the next trip were to connect the caves and to push the downstream sump. The dive was uneventful with the passage getting just too tight for Stewart to follow. The least said about moving dive tanks, weights and other assorted large, heavy paraphernalia down and up 58 vertical metres the better. The connection team, after a few more climbs and a squeeze broadsided a pitch in the cave and the connection was made. We all celebrated hard that night.

There was one final trip into the cave; this time to enter from the other way. Hours were spent trying to find the connection to no avail. Any wonder the river was never found from this entrance. A chat with Josh who was the only one to actually see the connection point from the other side and the next day we were back searching again. This time it was quickly located and the river was reached. Laurie and Peter attempted via various means to push the upstream sump but were not successful. It needs SCUBA and Stewart is willing to return but the thought of lugging all the needed gear to the site - well - someone else can do it.

There remains a bit to be done in the cave. It needs to have some good photos taken of it. We tried hard but it needs people who know what they're doing to capture the cave.

The ELK speleothem needs further investigation. We have no idea exactly what it is having not seen or heard about anything like it before. It consists of four projecting, stalactite / stalagmite-type growths emerging from a single base that has broken from its original growth point. The longest of the 'prongs' is 75 cm with the last 7 to



*Peter looking down in to ancient water fall.*

8 cm of the prongs all have a whiter calcite growth. There is no evidence of the stump in the ceiling, walls or floor in the immediate area or upstream of it.

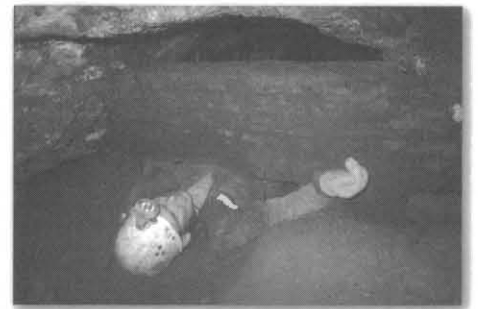
Another mystery needing to be solved is the shoe sole we found in the streamway

just upstream of the upstream sniff. There is no way it could have entered the cave from our Mx-444 entrance. It is also highly improbable that it came in via the other entrance unless it can fly up climbs. It must have come from upstream somewhere.

The streamway, in one place, has what appear to be fungal threads hanging from speleothems in the ceiling. With our old eyes, and not wanting to disturb them in any way we're not quite sure. All but one of the 'threads' are straight. One is a spiral.

The cave discovery, while truly amazing, was bitter sweet. It is illegal to make any alteration to land managed by Parks Victoria as The Potholes Reserve is. When we noticed the draught we just got carried away. With such a significant discovery we knew that we had to inform Parks Victoria but had a very real fear of prosecution. A local politician approached a high ranking Parks Victoria staff member for us. We were given immunity. While disappointed in the illegal dig Parks Victoria were understanding and professional about it.

**Note:** Complete article first published by the Victorian Limestone Caving Team 2006, "Outkarsts" Special Edition Number 1.



*Laurie sliding under calcite dam.*



*The gang of four: Kim, John, Eric & Laurie.*



Y. INGEME



# Burnabbie Cave Exploration 2006

*New discoveries on the Nullarbor, using Closed Circuit Rebreathers and Aerial Mapping*



By Paul Hosie (WASG)



The Roe Plains of the Nullarbor hold some incredibly complicated cave systems. Fortunately, for ASF cave divers, most of them are full of hypersaline, crystal clear water! Passage development has occurred at the water table, some 10-15m under the surface of the plain as well as at multiple levels underwater where severe haloclines are experienced. The average diving depth is approximately 7m and the maximum found so far is approximately 15m which means that some very long dive times can be achieved.

Burnabbie Cave is undoubtedly the current King of the Roe Plains caves with over 2.7km of surveyed passages, 95% of it underwater. There are some large, half submerged chambers and passages which are rich troglobitic fauna habitats. The ceilings of these chambers are festooned with tree roots. Water droplets hang suspended off the tree root draperies and make a spectacular sight to the surfacing diver. As the draperies die and decay, they provide the basis of the food chain which includes a multitude of cave adapted cockroaches, centipedes, isopods and spiders.



**Burnabbie Troglobitic Spider.**

Underwater in the fauna chambers, troglobitic amphipods feast on the nutrients provided from above. The rest of the underwater cave passages contain jelly-like mantles of bacterial colonies hanging from walls and ceilings whose beauty is only exceeded by their extreme fragility. Because of the delicate nature of these caves and the fauna habitats they contain, only ASF cave divers following the ASF Minimal Impact Caving Code have so far been provided access to them. In the interest of protecting these unique caves from unwitting damage, this requirement is unlikely to be relaxed.

## Bakers and Home Handymen into Action

With a difficult cave diving penetration of over 900m from the entrance (p=900m) of Burnabbie Cave, exploration and mapping was continued by WASG members Alan Polini and I during the period 30 Oct - 04 Nov 06. During our trip planning, we decided that travelling to and from the end of the cave would be more efficient using our Closed Circuit Rebreathers (CCRs) and then conduct our explorations using normal sidemount open circuit SCUBA. Naturally, this required us to carry and stage cylinders of gas along the main line to be used in the case of a failure of our CCRs; this also meant we dived one at a time to guarantee each other's safety with respect to the bailout gas supply. Preparations for the trip included modification of our CCRs into an 'off-mount configuration' as well as familiarisation with their use before taking them into the cave.

Alan's Megalodon rebreather was comparatively easy to reconfigure as an off-mount due to the modular design of the unit. A sturdy blue breadbasket was used by Alan (as a professional baker, Alan is well qualified in the use of breadbasket technology) to house his scrubber cannister, counterlungs, oxygen and diluent cylinders. My own Inspiration rebreather was slightly more difficult to modify but a suitable plastic tub was found at Bunnings (as a professional tinkerer, I am well qualified in the use of Bunnings gadgets) which was sawed and drilled to provide easy yet secure access to all the rebreather controls and displays. The Inspiration also had to be modified by the addition of electronics for a head up display (HUD). A HUD is a critical requirement for diving on a rebreather in a cave as it allows continuous monitoring of the oxygen level in the breathing loop without adding to the task loading normally encountered whilst cave diving (such as buoyancy control, gas supply and guideline management).



**Alan Polini... Breadbasket Technologist.**

Nullarbor Diving



## Set Up Dive - Exploration Continues!

The first dive was done by both Alan and I together with four cylinders of open circuit scuba each to check whether the modified rebreathers would fit through the restrictions or not. Our secondary objective was to assess the main lead found on my last dive of the previous visit in October 2005. It took us about one hour to swim to the wide room that was identified as the current end of the cave (p=930m). It was clear to us on our journey into the cave that we would have no problems negotiating the restrictions with the CCRs. Finding ourselves at the end of the cave with gas to spare, I tied on a fresh reel of knotted line and explored what I had hoped was the most promising lead for the cave's continuation. A fairly low and flat but wide passage went for 75m before pinching out. This was the first place in the cave that a diving penetration of over 1000m was realised which was excellent, but not quite the major conduit we were wishing for! A number of other leads were noted in the area on our return journey.

## Enter the Closed Circuit Rebreathers

On the next two dives, Alan and I independently used our rebreathers to stage our 100cuft stage cylinders in the cave as safety backups for the rest of the weeks rebreather diving (one was placed at p=500m and the second was placed at p=930m, the 'ends' of the cave). If the cave continued in a big way (ie. p=2000m+), we had more stage cylinders to place every 500m which we calculated as being a suitable and highly conservative approach. The most important thing we had to be mindful of whilst diving this type of scenario was that if we had a failure of our open circuit scuba at the limit of our exploration and got back to our rebreather to find it dead (ie. loop flooded or electronics failed), then we would be in a 'spot of bother'. Our solution to this was to commence our open circuit exploration from a staged bailout cylinder next to which our CCR was secured

- thus providing full redundancy for the one hour swim out of the cave.

On subsequent dives to the 'ends' of the cave, two other leads were pushed past the 1000m mark by Alan and I, but they all closed out the same way - low, flat and silty but no major conduit to be seen. Alan discovered and explored a fantastic set of parallel passages of over 130m length near the end of the cave which we managed to connect and survey through to another of our newly discovered passages. The cave seems to branch into low flat, parallel passages in this section of the cave but logic and the shape of some of the passages indicates that a continuance must be there somewhere. Although we systematically checked the side walls and surveyed all the passages we had found, there remains the possibility that one of several small leads near the end of the cave will continue. This has after all, been the story of Burnabbie exploration so far - to reach a passage terminal only to then find during the exit or next dive, a parallel bypass to the conduit's continuation.

## Aerial Underwater Mapping?

As an interesting aside, Paul Devine (SRGWA) has discovered that aerial photos of the area clearly show up lines of thick vegetation that we have confirmed track directly over the top of the main cave passages of both Burnabbie and Olwogin Caves. It is hoped that as well as guiding the direction of our underwater exploration, bushwalking along these vegetation lines will reveal more cave entrances. Between our dives, Alan and I did some wonderful bushwalking and visited over twenty possible karst feature locations provided by Paul Devine. Most were large blind collapse dolines, but three were definitely caves and one of those even made it down to the water level. Without doubt, there are plenty more discoveries to be made on the beautiful Roe Plains and a load more aerial karst feature locations to visit and document for the Karst Index.

The rebreathers worked beautifully and allowed us to safely travel to the end of the cave where our regular scuba cylinders were used to spend the maximum amount of time exploring and mapping the many new passages there. We had no technical problems with the units or their manipulation through the cave. We became quite adept at controlling our buoyancy whilst pushing the CCR ahead of us through a restriction, which may sound simple but is not. As you breathe in, the buoyancy of the CCR decreases (i.e. it sinks) and your body tends to rise as the air transfers from the unit to your lungs. Breathe out, and suddenly the CCR starts floating up - all very much a pain in the bum when you are trying to float on an even level through a restriction! We worked out that shorter, shallower breaths and slower breathing whilst negotiating restrictions helped us maintain good control over the unit's position. We also learned to use the floating and sinking of the unit to our advantage, for instance, going through a restriction with a drop on the exit side of it, just breathe in and the unit drops like a stone and then follow it down!

Once the CCR is clipped back onto the side-mount harness, it's a simple matter again because all the gas is in the same vertical plane. Breathing resistance of the units (on exhale) is slightly increased from the normal configuration but in no



Paul & Alan with CCRs.



way unmanageable. We minimised this effect by the use of rubber bungeys to hold the unit as close to our chests as possible. Our off-mount CCR dives serve as excellent experience for other Australian cave-diving sites where long underwater distances with low restrictions are encountered and CCRs offer a clear logistical advantage. By the week's end, over 500m of new passages had been added to the map, making Burnabbie the 4th longest underwater cave so far discovered in Australia (after Cocklebidy, Panniken Plains and Tank Caves).

## The Last Dive?

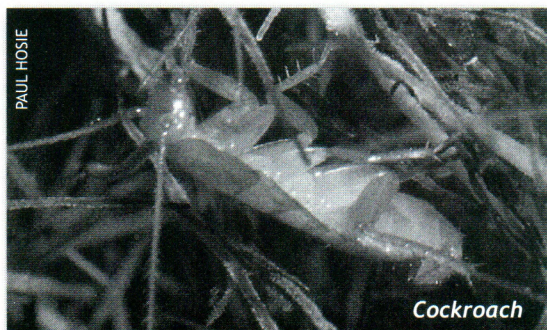
As usually happens on exploration trips like this, the last dive turned out to reveal an entirely new section of beautiful underwater passages. This was in effect the last, 'cleanup' dive where Alan and I used our open circuit (yuck!) scuba to remove the stage cylinders we had placed at the start of the week. The new passages were found in a completely unexpected section and depth of the cave where a survey question mark previously considered to be relatively insignificant, opened up and just kept going (it GOES !). Ninety metres of line was laid before the golden rule of thirds reached and the dive was turned; I managed a snappy set of bearing/distance only survey along the way. My head was whipping back and forth like a fair-ground clown's along the way, peering down multiple, handsome looking leads – 'Crikey' I gurgled into my regulator!

This 'last minute' discovery offers some tantalising possibilities because this new passage has a different look to it from the rest of the cave (i.e. clean, white limestone collapse tunnels and chambers) and it heads in a different direction to the main conduits we had spent all week diving. Very exciting and very frustrating too – knowing we wouldn't be back for a number of months and the question of what lays beyond burning in our souls! The use of aerial imagery to guide the direction of our underwater exploration in these new passages is a fantastic new approach which we hope to capitalise on during return trips.

Much remains to be done on the beautiful Roe Plains as well as beneath in it's magnificent caves. We are planning to continue the exploration and mapping efforts in the area during the coming years. If you like bushwalking and exploration (or cave diving!), contact Paul Hosie on paulhosie@trimixdivers.com about joining us on a future trip. ■

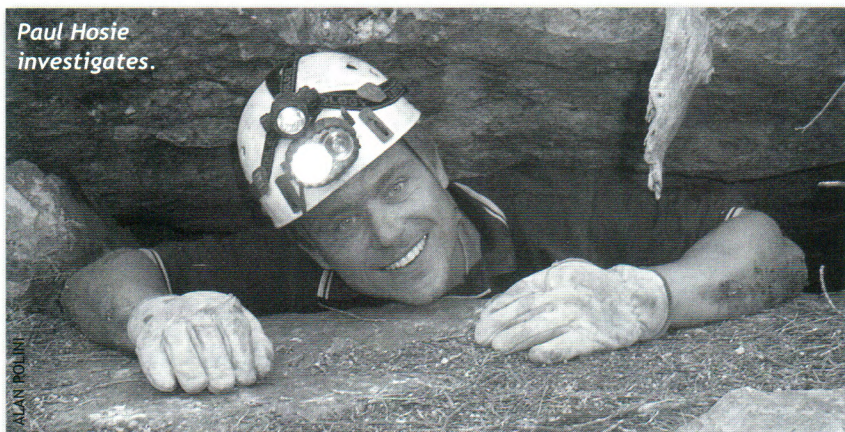
## Post Article Note:

During our April 2007 trip as part of the Nullarbor Karst Project we explored an additional 300m of passages in Burnabbie Cave, bringing to total just over 3,000m of submerged passages. A further trip report on this and the broader implications of the Nullarbor Karst Steering Group will be the subject of a future CA Article.



Cockroach

Paul Hosie investigates.



Alan at a newly discovered Roe Plains Cave.

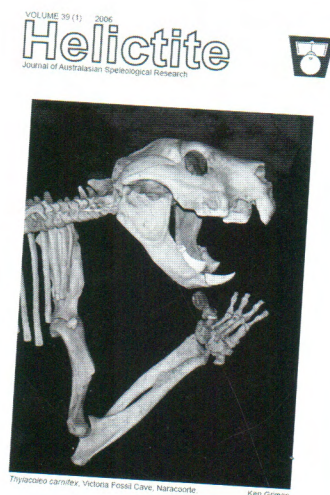
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## Large Caves Discovered on Flores (Indonesia)

*Exciting five-week palaeoclimatology research expedition; detailing access logistics, survey difficulties of Liang Luar cave and descriptions of major caves we visited on the island of Flores. Unexpected cave extensions were explored, including Liang Bua often referred to as the "Hobbit Cave".*



By Garry K. Smith

### Abstract

In July-August 2006, a group of five Australians and one Indonesian set out on a five-week palaeoclimatology research expedition to the island of Flores, eastern Indonesia. The project involves the study of speleothem growth and composition to determine past changes in the regional climate. These data will be related to human habitation, with the added bonus of possible links to the demise of the recently discovered human skeleton named *Homo floresiensis* ('the Hobbit'). Our goal was to visit caves in the area near the town of Ruteng to locate and collect samples of suitable speleothems which could yield useful palaeoclimate data.

The extent of the cave systems around Ruteng was not fully known other than through brief descriptions by previous researchers of non-caving background. In total, our group visited five major caves including the now-famous Liang Bua (Hobbit Cave), which in 2004 yielded the most significant paleoanthropology find in decades. To our amazement we discovered and surveyed a large extension to this cave.

Another cave (Liang Luar) was known by the locals to be approximately 100 metres long. A route past a rockpile choke revealed extensive passage and huge, well-decorated chambers, which was far beyond our wildest expectations. To date, this cave has been mapped to just over 1.6 km with much more to be surveyed. It is hoped that a future expedition planned for 2007 will enable the survey of this cave system to be completed.

This paper deals primarily with the access logistics, survey difficulties of Liang Luar cave and description of the five major caves we visited.

### Introduction

In July-August 2006, a group of five Australians and one Indonesian set out on a five-week research expedition to the island of Flores in eastern Indonesia. Among the group were three scientists (Dr. Mike Gagan, Dr. Russell Drysdale, Dr. Linda Ayliffe) a senior technician (Bambang Suwargadi) and two cavers (Neil Anderson, Garry Smith). Our Indonesian colleague, Bambang, is employed by the Research and Development Centre for Geotechnology, Indonesian Institute of Sciences (LIPI), which is the Indonesian equivalent of the Australian CSIRO. Nic Severino joined our group for several days and assisted in part of the Liang Luar survey.

The recent discovery of a complete human skeleton measuring just one metre tall and dated at around 18,000 years old, has been heralded as the



**Left to Right - Linda, Neil, Garry, Mike, Russell and Bambang at the entrance arch to Liang Bua.**

most significant paleoanthropology find in decades. The skeleton, named *Homo floresiensis* ('the Hobbit'), was found by an Australian - Indonesian team led by Professor Mike Morewood (University of New England), while excavating a six-metre deep pit in Liang Bua cave on the island of Flores. The discovery has sparked much debate and inspired our research project, which is led by Dr. Mike Gagan of the Research School of Earth Sciences at the Australian National University.

Mike was instrumental in applying for and gaining funding from the Australian Research Council Discovery grants scheme to study the region's palaeoclimatology. The research involves reconstructing the history of monsoon rainfall extremes, abrupt climate shifts, and catastrophic volcanic eruptions. The information contained within speleothems could yield many secrets of the events which have shaped the history of human habitation in Indonesia, as well as the weather conditions which influenced habitation in Northern Australia. There was a need in this specific project to collect some



**Mike and Bambang after a long day underground.**



stalagmites for full laboratory analysis. The majority of the samples gathered were specimens found already broken in the cave from natural causes. However, in cases where a specimen needed to be collected, the group used unobtrusive 'mini-drill-holes' to investigate the quality of the stalagmite material, and ensure it was worthy of collection. Only a few essential specimens in out-of the way parts of the cave were collected.

## Logistics of the expedition.

- Special permits were obtained from the Indonesian Institute of Sciences before visiting the karst area. This took a considerable amount of effort on the part of Mike, Bambang, Heather Scott-Gagan and Joan Cowley. Flights to Flores via Jakarta were very limited, so our group opted for an island hop approach to reduce waiting time.
- A considerable amount of sampling and caving equipment had to be transported from Australia. This added greatly to the bulk and weight of equipment manhandled on and off each mode of transport. The excess-luggage cost was quite expensive.
- In addition to the government permits, we had to seek permission from the local authorities and each of the cave property owners. Many thanks go to Bambang for being so methodical in gaining all these approvals.
- Westerners are not common in remote locations in Indonesia, so at times the language barrier added to the complexity of organizing accommodation, meals, supplies, etc. Bambang's interpretive skills were much appreciated. Our operational base was set up at a motel in the town of Ruteng nestled high in the mountains of central Flores. The backdrop of several extinct volcanic mountains occurs to the south while rich green rice paddy covered ridges and valleys stretch as far as the eye can see to the north.
- On the first trip to the karst area we had hired Toyota Kijang 1.8L petrol wagons. These proved to have inadequate ground clearance as they kept bottoming out on the rough road. Also they had to be pushed up the steep sections a number of times on the way back to Ruteng. It became very obvious after the first trip over the 11.5 km of rough, steep and narrow winding road, that these vehicles would not serve our purposes for the many trips required. On the next occasion Bambang organized a Mitsubishi Colt diesel truck which is generally used by villagers as a people carrier. This form of transport, while

adequate for the task, did have limitations with comfort and exhaust fumes. It was also prone to mechanical problems due to the age and repair of the vehicle. These included brake failure with air in the hydraulics, fuel blockages, tyre puncture and a front wheel bearing which collapsed on the way down the mountain. I will say that the full-time mechanic who travelled with the truck did know how to carry out running repairs. The average time to travel from Ruteng to the karst area was 1 hour 15 minutes to cover the 11.5 km, provided there were no mechanical problems. This gives a good indication of the condition of the steep single lane road which snaked its way down the mountain past countless small villages.

The five major caves entered are now discussed.

### 1. Liang Galang, which in Indonesian means 'Bathtub Cave'.

The entrance to this cave is at an elevation of approximately 548 m ASL and is below a small NE facing limestone cliff overlooking a river valley of rice paddy fields. There are two spacious entrances with a sloping earth and flowstone floor leading toward the back of a large chamber measuring approximately 20 metres long by 20 metres high. At the bottom of the entrance slope and still within the twilight zone there are a couple of very large impressive rimstone dam basins which were dry at the time of our visit. No doubt they would be very spectacular when full of water and they are certainly the reason for the cave's name. The earth floor slopes to the left of the basins and into a dark zone along a short distance of high ceiling passage. It could be argued that this was just part of the one chamber. At the end of the sloping floor in the dark zone, there is a small drainage point at floor level which is impassable. High above there is a chance for further exploration with a well-decorated passage visible. This would take some rigging with scaling poles and ladders.

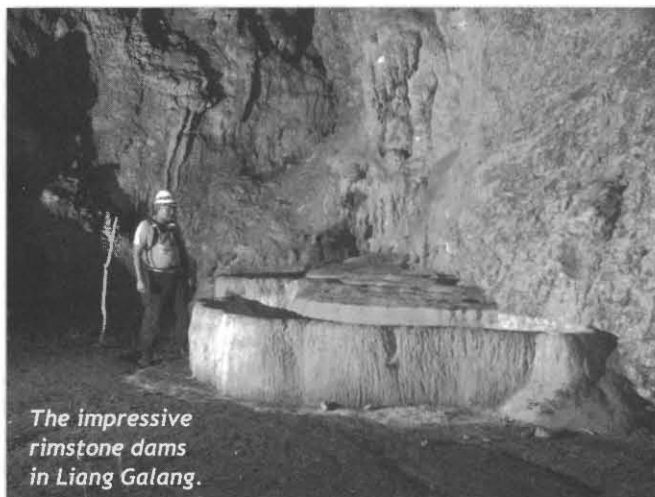
### 2. Liang Neki, which in Indonesian means 'Bad Cave'.

The cave is approximately 13.5 kilometres by road from Ruteng and takes two hours by vehicle due to the state of the road. There is a bamboo platform in the cave entrance, which is used by a local family as shelter.

From the entrance a spacious passage with dusty earth floor slopes steeply down to a restriction then opens up again into large passage with damp mud floor. Once through the restriction the humidity



*Mitsubishi Colt diesel truck.*



*The impressive rimstone dams in Liang Galang.*



**Bamboo platform in entrance of Liang Neki. The extent of this cave was not fully explored.**



Mike is dwarfed by the immense size of Liang Bua entrance chamber.

increases considerably. A number of echo location Waled birds were sighted in this area of the cave. They make an unusual clicking sound while flying around the cave.

There are a couple of small drops in the sloping floor, the last one being the largest at about three metres. From here the cave opens into a large chamber with a steeply sloping floor at the far end. From the back of the chamber it is possible to proceed in three directions. To the left a very steep mud slope leads to an active stream passage which can be followed for some distance. Straight ahead continues on a considerable distance through several chambers with high sections and the lower passage eventually turns into a muddy crawl. To the far right there is a 1.5 metre climb through a keyhole and then down about 2.5 metres into a well decorated chamber. This chamber was found to have foul air with a very low concentration of oxygen and high carbon dioxide.

### **3. Liang Bua, which in Indonesian means 'Fruit Cave'.**

This cave has been nicknamed the 'Hobbit Cave' after the discovery of the *Homo floresiensis* skeleton in 2004.

The entrance is at an elevation of approximately 562 m ASL and is below a small NE facing limestone cliff overlooking a river valley of rice paddy fields. The entrance is approximately 170 metres to the NW of Liang Galang.

The entrance chamber of Liang Bua measures 51 metres long, averages 13 metres high and 27 metres from the entrance overhang to back wall. This chamber is very impressive with a number of seven metre long stalactites hanging in the middle of the chamber. They are bent and twisted as if being pulled toward the daylight. Directly below the stalactites is

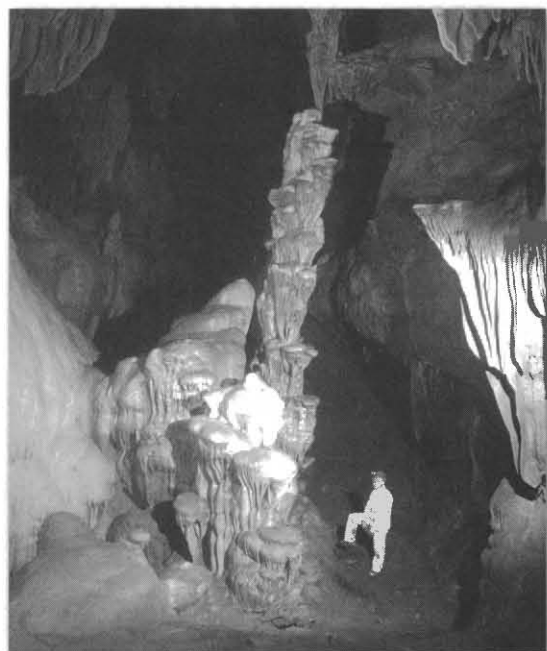
a 2 m diameter x 2 m tall stalagmite. The back of the entrance chamber to the left, a steep slope leads up through some rocks to an impressive stalagmite at the rear of a balcony overlooking the chamber. Behind the stalagmite there is a short section of passage leading off to a small chamber with some good decoration. From the base of the 5.4 m high balcony a laser distometer was used to obtain a 19.6 m measurement from floor to the top of an aven.

To the far left of the main entrance chamber and at the base of the balcony slope there are a couple of holes between boulders which lead into a 23 metre pitch at an incline of 60°. At the base of this pit there is a sloping dirt and rubble floor leading into an impressive chamber 23 x 24 x 5.4 metres high. It is predominantly an earth (mud) floor with drainage toward a stream sink at the NE wall. The ceiling is covered in many stalactites. To the NW there are a number of stalagmites scattered up a flowstone slope. This slope leads to a small chamber located 12.4 metres below the concrete entrance path.

A number of Horseshoe bats and Waled birds were sighted in this chamber. The Waled bird has echo location ability and can be heard making an unusual loud clicking sound as it flies around in total darkness. The birds look similar to a swallow with jet black feathers.

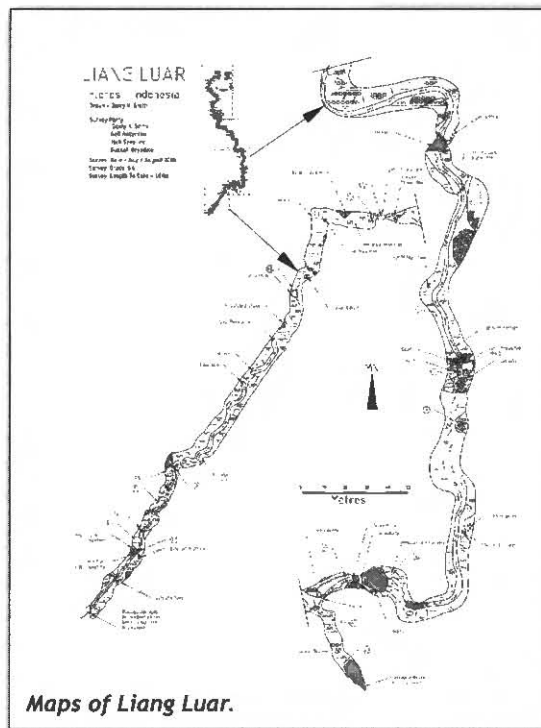
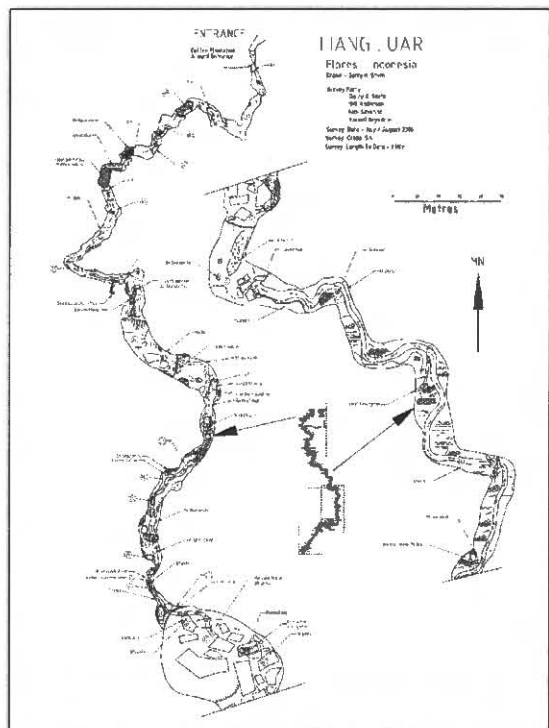
### **4. Liang Luar, which in Indonesian means 'Mist Cave'.**

The entrance is at an elevation of approximately 550 m ASL. The entrance, measuring approximately 1 metre x 1.5 metres, is at the base of a 20 metre cliff. It has the appearance of a typical out-flow cave and there are signs that in periods of very heavy rainfall a small amount of water would flow from the entrance. The first hundred metres of cave is an easy walkthrough meandering passage with tacky mud underfoot. At this point the passage is blocked by a boulder choke which must be climbed to a height of 5.5 metres. A route past the rocks leads down to more passage at the same elevation as before the choke. Here the full width of passage floor quickly turns to gooey mud up to knee deep with a few centimetres of water over the top and the roof height reduces to just 0.7 metres. This chamber has been named 'Kabangan



**Cadi Prambanan.**





**Maps of Liang Luar.**

Kerbau' meaning Buffalo Wallow. The only sign that anyone had ever passed the boulder choke was one set of small bare footprints leading along the passage and a little way into the mud before retreating. No other sign of human entry was sighted past this point.

From the large mud pool, another hundred metres of low passage before the cave opens up to large chambers with excellent decoration. Several active stalagmites approximately 7 metres tall mark the start of a dramatic transformation from small passage into large halls and spacious caverns. These beautiful large speleothems ranging in colour from deep orange through to pure white, are truly nature's masterpieces. They have been named 'Cadi Prambanan' after a temple of the same name. There are two small stream sinks encountered in the main passage before a huge chamber is encountered at about 0.5 km into the cave. This chamber, named 'Raksasa Ruang' (meaning Huge Hall), is approximately 90 metres long x 50 wide x 30 high. There are some massive boulders strewn across the chamber which make navigation a little difficult. It was calculated that there is approximately 50 metres of solid rock above this chamber to the surface.

After climbing over the large boulders one descends a slope leading to passage at an elevation not much above the earlier passage. There are a number of sections of excellent speleothems.

After descending about 4 metres a stream sink is encountered between rocks. The passage becomes a rather large and meandering railway tunnel shape, 10 to 14 metres high and the same in width. There are typically 2 to 3 metre banks of damp clay on either side of the passage and a stream valley snaking down the middle. Caving at this point becomes more of an underground bushwalk. At about the 1 km mark a huge stream sink is encountered. It has not been explored yet, but a distometer reading measured it to be at least 19.7 metres deep. This can be skirted around by a tricky climb on the right side.

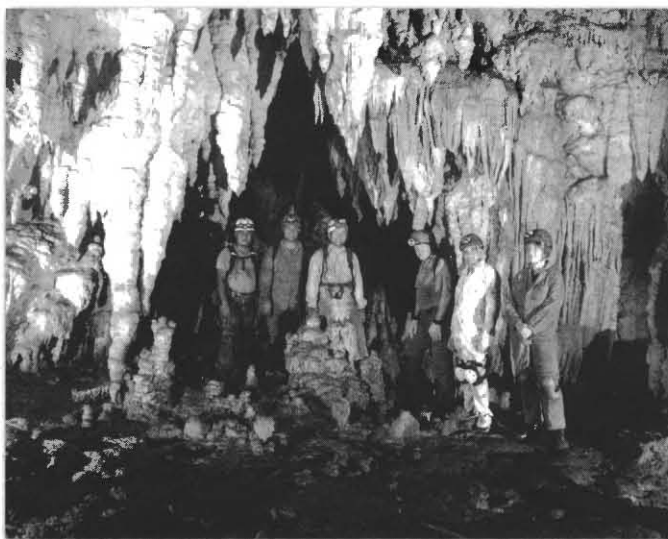
At about the 1.2 km mark a large deep pool can be skirted around on the left side by climbing up between several large columns. Another 260 metres

further on another large pool of water is encountered at the base of a 4 metre waterfall. This can be free-climbed with some difficulty.

A short distance above the waterfall the cave splits into two passages. The high passage narrows down through a well-decorated area before opening up into large dry passage again. The lower passage leading off steeply to the left is obviously a resurgence which wells up in times of high rainfall, then overflows into the main passage and over the waterfall.

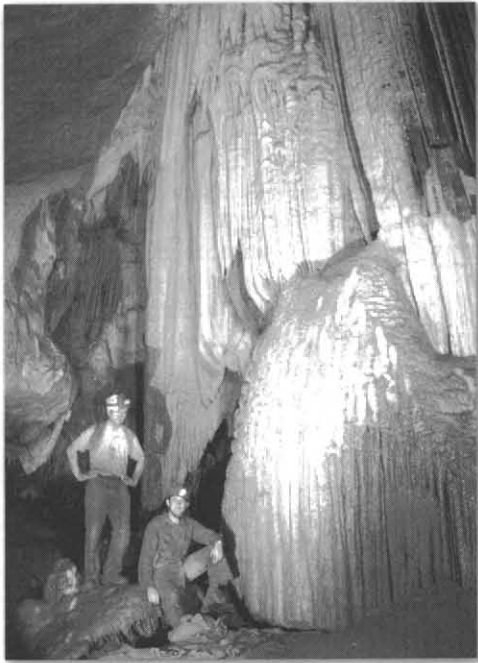
Continuing along the high passage past lots of excellent decoration the cave continues to meander. There are in places large channels in the earth floor leading into stream sinks. It was possible to make long sightings up to 72.5 metre with the laser distometer during the survey of this section.

At the 1.6 km mark the survey was terminated due to lack of time. The cave however was explored for a further several hundred metres past a tight squeeze and back into large passage. Eventually the passage splits into two of approximately equal size. Hopefully the rest of the cave can be explored and surveyed during the next visit in 2007.



**Liang Padut  
main chamber.**





*Russell and Garry at 1.4km into Liang Luar.*

The whole mountain above Liang Luar is cultivated by the local population to grow coffee, pineapples, sweet potato, bananas and rice. The cave system is fed by many surface streams leading into about 10 major dolines with associated sinkhole caves which have yet to be fully explored. Indications are that the sinkhole caves are not venting the Liang Luar cave atmosphere and will all pass through sumps before entering Liang Luar. Within Liang Luar there are at least 7 stream sinks which feed to a lower cave system, as yet unexplored. These stream sinks generally prevent water from flowing out the main entrance through which we entered the cave. The active efflux of the cave system is not

known at this point in time.

**5. Liang Padut is located approximately 200 metres to the west and approximately 50 metres higher in elevation than the entrance of Liang Luar.**

It was rumoured to be part of the same system as Liang Luar. However, we found no evidence to support this.

The cave has a very large collapse doline entrance and has acted as a resurgence at some point in the cave development. There is a steep sloping entrance, 35 m long at  $-37^\circ$  into a large chamber measuring 37 metres long by 21 metres wide and 12 metres high. A small shaft leads up from one side of the main chamber and comes out at the top of the main entrance slope on the right side. The large chamber is very well decorated with white speleothems.

#### **Cave Surveying**

The Liang Bua and Liang Luar caves were surveyed using a Leica (Disto Classic a) laser distometer, Suunto inclinometer and baseplate magnetic compass.

Flashing red LEDs which snapped onto the terminals of small PP3 batteries (9V) were used as survey station markers. These were extremely good as they could easily be seen over distances of 80 metres and eliminated the need for a person to stand at designated survey stations. For difficult survey stations a blob of mud was used to stick the flashers to the cave walls.

Distances greater than 60 metres usually required someone to hold a brightly coloured pack as a target for the laser distometer. Despite the distometer

being accurate to the millimetre (0.001 metres) the survey data was only recorded to the nearest 0.01 metres.

Surveying in Liang Luar was made very difficult in places due to the quantity of gooey mud, particularly some low awkward sightings. Keeping the survey pad clean was very

difficult during some periods when surveying on my own, while scribing and taking readings.

#### **Discoveries so far.**

The oldest animal bone collected from the lower chamber of Liang Bua has been dated to about 90,000 years. This date is very exciting as it indicates that the big "mud-mound" may contain a wealth of very old bone material. Future paleontology expeditions are planned and may yield a wealth of knowledge about the prehistoric past.

A stalagmite nicknamed "Big Boy" which was sampled from Liang Luar has been dated at its base as being 25,000 years old. Two more stalagmites were 'mini-drilled' near the bases and the calcite powders extracted from these holes have now been dated to 40,000 years old. This is fantastic because it means that they grew from just prior to the last glacial maximum right through to the present. There is virtually no information about the climate during the last ice age in Indonesia, so this is a real find.

From the scientist's point of view, perhaps the most exciting discovery is a date from a short-core extracted from a collapsed flowstone that has yielded an age of 200,000 years. The flowstone is 1.5 m thick, and the date is from 0.5 m depth, so it is possible that the entire flowstone could be as old as 600,000 years. If this longevity proves to be the case, the flowstone will give the team a record-breaking history of past climate in the tropics.

#### **Future discoveries.**

Given the remote nature of the Miocene limestone karst area, there is considerable scope for more discoveries. The locals know the whereabouts of the caves but do not have the equipment, lighting or caving knowledge required to undertake exploration. Given the need to put food on the table through agricultural farming, there is not much time nor inclination for most locals to explore caves. There were a few exceptions with a couple of entrepreneurial Indonesians wanting to learn more about the caves with the view of opening them up for tourism. Since most locals and cave owners are very poor, the commercialization of the caves without putting in place lots of preservation infrastructure would certainly be a disaster. The making of a quick dollar would rule over preservation of such wondrous natural beauty.

#### **A few events which occurred during the expedition.**

1. When entering the 23 metre pitch below the main chamber of Liang Bua for the first time, I encountered a large boulder 600 to 700 mm diameter (probably weighing half a tonne). The boulder appeared to be wedged between the walls of the pitch but moved slightly when my foot was placed on it. On close inspection I noticed that it was just balancing on a smaller rock which was jammed. I locked off on the abseil rope and retrieved the trailing rope hanging below. The large balancing rock only took a little nudge and it went crashing down the pitch with a tremendous rumble and smashed into many bits. This was very lucky as the abseil rope could have easily pushed on this loose boulder and brought it down upon me. I continued the abseil to the bottom and was amazed at the size of the huge chamber which lay before me. The floor was mainly tacky mud, but there was a high section which contained a number of large stalagmites.



*Flowstone and dripcones merge and erode away over thousands of years as the silt banks change shape.*



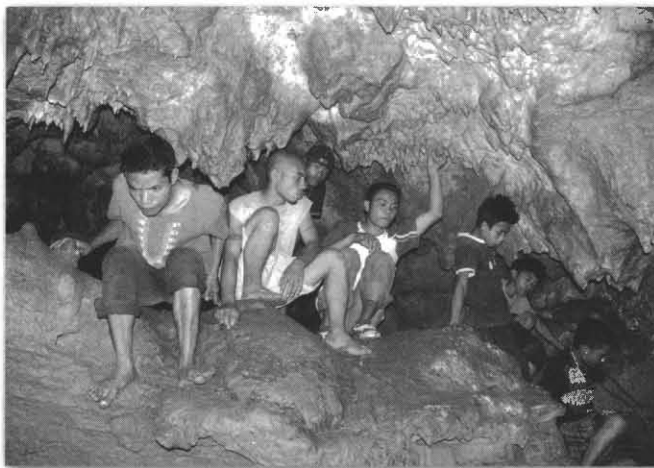
2. In Liang Neki after gaining permission to enter, we trogged up and headed in with a cast of many children and adults in tow. Only one local child had a torch with a single LED globe. The rest were relying on the light from our head torches. It was quite comical with our group of researchers dressed in overalls, helmets, headlights, solid boots and huge packs of equipment. The locals had shorts, tee-shirts, thongs or bare feet, no helmet or light. After following us a long way into the cave, the children went back out, led by the child with the single LED torch.

3. In Liang Neki I climbed through a small keyhole leading to a well decorated chamber. The 2.5 metre climb down was rather tricky as tacky mud covered all the solid rock. I entered and was followed by Russell. In the middle of the chamber was a pile of large rocks with 2 metre deep holes between. As I was crossing, a lump of mud broke off the rock, sending me crashing down onto my right knee and left me half dangling between the boulders. The pain was excruciating so I did not move for a couple of minutes hoping it would subside and that no permanent damage had been done to my knee. Then I started feeling very dizzy and said to Russell there was high CO<sub>2</sub> and I had to get up. He helped me up and I stood on the far side of the chamber. That was the last I remember until I heard Russell calling me. I believe I had passed out and thankfully Russell was there to stop me from falling back into the pile of rocks. A check was made of the air at knee level and sure enough the cigarette lighter would not work. There was less than 14% oxygen and probably at least 6% CO<sub>2</sub>.

4. The Liang Luar owner took us to another cave on the ridge a few hundred metres to the east of Liang Luar. A trail of children followed. Not far away another doline was located and we walked down into the bottom of the depression. The last 3 metres was a small climb over some rocks and the cave owner followed me down. I scrambled around with a small torch looking for any possible leads. There were some nice decorations but no large passages leading off. Everyone else was still further up the doline slope when there came a tremendous amount of screaming from a small child. Then a few loud swear words from Russell. The cave owner listened for a moment and clasped his hands together and crouched under a rock as if to pray. I was totally bewildered when he beckoned to me to crouch under the rock, turn off my head torch and also pray. OK this is weird, sounds like someone up the top is dying and he wants me to pray. After another 5 minutes he looks up and points at a mass of large flying insects swirling around the cave entrance and covering the ceiling above us. Then it struck me, they were huge stinging wasps and the nest was some 5 metres above me. We waited some 20 minutes while the whirling mass subsided and they retreated back into their hive. Then we both crept back up the slope and out of the doline.

Eventually we met up with the others. There was Russell with 2 stings, Linda with 2, Mike with 4, Bambang with 1, a couple of the kids had been stung and had totally bolted from the scene. It was obvious that the pain was very intense and huge welts had formed around the stings on each victim. Thankfully, the cave owner had known what to do and we missed out on the painful experience.

5. One evening, while standing at the curb waiting for the vehicles to take us to a restaurant, I fell down



*More than 20 children flock into Liang Neki with a one LED torch between them.*

to my waist through a gap in the pavement which covered the drainage system (sewerage). It was quiet a shock to be standing on two feet then totally falling. The feeling of a sharp object running up my leg as I fell, had me thinking that I had split my leg right open for its full length. Luckily the reinforcing bar which protruded from the broken concrete had been bent downward and my long pants had taken most of the abrasion impact. My foot was soaked with water and stunk of sewerage when I climbed back out the hole.

### Acknowledgements.

I would like to thank Mike Gagan and Russell Drysdale for their helpful reviews of this paper. Also thank you to Neil Anderson and Nic Severino for assistance in exploration and surveying the Liang Luar cave. Mike, Russell, Linda and Bambang provided valuable organisation of the field logistics and academic expertise, which assisted greatly in interpreting the geology of the area. Our group worked well as a coherent team in the field which made the whole expedition a pleasurable experience. Financial support for the expedition was provided by an Australian Research Council Discovery grant (DP0663274) to Mike Gagan (ANU) and Wahyoe Hantoro (LIPI).



*Footpaths have many holes.*



# Cave Conservation and Restoration

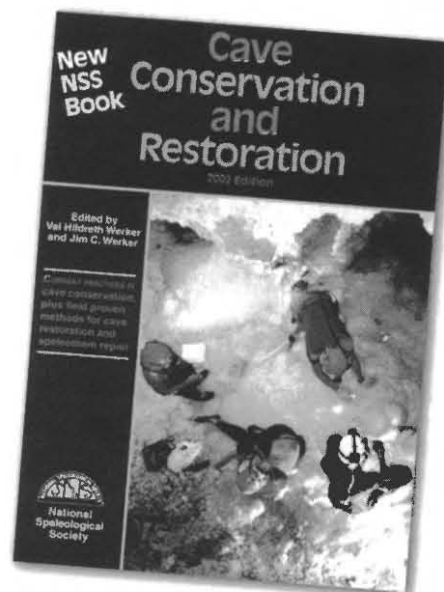
## (Recommended as a Must Have!)

Current practices in cave conservation plus proven field methods for cave restoration and speleothem repair by Any Spate.

I gratefully received a copy of Cave Conservation and Restoration - 2006 Edition - published by the National Speleological Society (of America). This book is simply amazing - it runs to 600 + xiv pages and contains dozens of B&W and colour photographs and diagrams. This remarkable volume is edited by Val Hildreth-Werker and Jim C. Werker.

For a price of \$US37 (\$US39 non-members - \$447-49.50) + freight this book is a steal! An absolute must for ASF member societies and individual cavers!

See <http://caves.org/service/bookstore/index.shtml> for more details.



## The NSS Bookshop blurb says:

For every cave-related decision, the foremost concern should be protection of the cave resource. This book, formatted in a handy field-manual size, provides ideas and practical tools.

Part One describes current concepts and practices in cave conservation. Identifying/protecting cave resources. Establishing limits. Monitoring impacts. Defining management standards. Improving ethics.

Part Two covers tools and proven methods for cave restoration and speleothem repair. Cleaning cave features. Removing artificial fill and debris. Controlling organic nuisances. Organizing cave projects. Repairing speleothems.

At 600 pages - and more than 4.5 cm thick - it is hardly 'handy field manual size' but it is an extremely comprehensive documentation of thousands of good practical ideas as well as the more theoretical background to conservation and ethics.

I have had the chance to dip into it more deeply - this is a dip-into reference book - but it can also be read cover to cover. Fabulously illustrated and referenced (although with a preponderance of USA references - which is fully understandable - more on references later) it addresses so many aspects of cave and karst conservation - plus the restoration component that it is a veritable bible. Many of the questions that have been directed at me over the past three decades are tackled here. As I suggested, above all caving clubs, management agencies, show cave sites and professionals dealing with cave and karst conservation MUST have this book.

I was going to trespass on our editor's good nature and list all the 90 separate articles contributed by 46 authors and reviewed by 72 experts as there is no other way to adequately canvass the breadth of this remarkable book. But that would make this review too long so here is a subset of (perhaps) the most significant, interesting or unusual articles:

## Part One: Introduction

- Endless Caves and Lost Stalagmites
- Vision for This Book
- Not the Last Word - But a Call to the Future

## Part Two: Cave Conservation, Management and Ethics

### Section A: Identifying and Protecting Cave Resources

- Current Best Practice
- Resource Inventory: A Tool for Cave Science, Management, and Restoration
- Biological Dos and Don'ts for Cave Conservation and Restoration
- Do Not Disturb Hibernating Bats or Nursery Colonies
- Federally Listed Bat Species of Importance to Caves and Mines
- Anthropogenic and Foreign Chemicals in Caves
- Protecting Microbial Habitats: Preserving the Unseen
- Paleontology in Cave Conservation and Restoration
- Archaeology in Cave Conservation and Restoration
- Rock Art and Historic Writing in Caves
- Karst Hydrology: Protecting and Restoring Caves and Their Hydrologic Systems

### Section B: Developing Cave Management Programs

- Material Considerations for Cave Installations
- Trail Delineation and Signage in Caves
- Are We Managing Caves or Conflicts?
- Model Ethics System for Resolving Cave Conservation Dilemmas

### Section C: Improving Caver Ethics

- NSS Conservation and Preservation Policies
- Do Cavers Need a Code of Conduct?
- Public Relations: An Essential Element in Cave Conservation

## Part Three: Cave Restoration

### Section A: Introducing Cave Restoration

- Cave Restoration Overview: Why Call it Cave Restoration?

### Section B: Organising Cave Projects

- Documenting Volunteer Value

### Section C: Restoring Cave Passages

- Cave Graffiti: The Writing is On the Wall
- Control of Lamp Flora in Developed Caves
- To Bleach or Not to Bleach: Algae Control in Show Caves



- Cave Lint and Dust Removal Projects
- Guidelines for Trash and Rubble Cleanup Projects
- Sinkhole Cleanout Projects
- Section D: Restoring Speleothems**
- Harms and Limits
- Sources for Cave Restoration Water
- Flowstone and Dripstone Restoration
- Cave Pearl and Delicate Speleothem Restoration
- Practical Caving Gloves

## Part 4: Speleothem Repair

### Section A: Introducing Speleothem Repair

- Current Best Practices in Speleothem Repair
- Speleothem Repair Materials

### Section B: Repairing Speleothems

- General Techniques for Most Speleothem Repairs
- Drapery Repair
- Rimstone and Travertine Dam Rebuilding
- Gypsum Repair
- Lava Formation Repair

### Section C: Specialised Mechanical Assists

- Apparatus for Large Speleothem Repairs

### Section D: Success Stories and Blunders

- Beware of Claims and Labels
- 'Three R' Story
- No Sacrificial Caves

Other sections:

[eight] Appendices

Biographical Notes

Index

Note that this is only a partial list of the book content.

As I said above there is something for everyone - from how to write a cave management plan to what glues work best for repairing gypsum speleothems. Each of the 90 articles is usually followed by cited references and suggested further reading. I haven't counted these but I was sufficiently parochial to look through and find all the Australia/New Zealand papers cited - there are dozens mostly from the Cave Tourism and Management conference proceedings. In fact the book subtitle "Current practices" is in part developed on discussion of Hamilton-Smith and others (1998) and Spate and others (1998) from the Twelfth ACKMA Conference at Waitomo. The editors emphasise that they are presenting current best conservation and restoration practices rather than world's best practice or similar terms - reminding us that improved methods [and, hopefully, ideas] are always on the horizon.

As well as the references, B & W and colour photographs and a reasonably complete index there are dozens of useful comments and tips in sidebars throughout the book. In terms of quibbles, both Neil Kell and I - after very little exposure to the book noted that there was no mention in the index of the use of vacuum cleaners. Ah ha! we thought, that is something that they have missed out on - even after we had talked about their use in a number of places. They had missed it out - but only in the index! Discussion of vacuum cleaning was in the text! And that is about the extent of my complaints although invertebrates is spelt wrong in a couple of places and sometimes the hyphenation in the sidebars hasn't worked well - but such are the whinges of a pedantic old \*\*\*\*! Whilst behaving pedantically why no diphthong in 'paleontology' but in 'archaeology'?

Nice to see, unusually for a book from the US, that both imperial and SI (Le Système international d'unités) metric units are used although there occasional glimpses of unfamiliarity with SI units as on the back cover.

A further issue for those from downunder may well be the unavailability of some of the adhesives and materials suggested as suitable for cave environments. I was particularly interested in comments on various epoxy adhesives - I imagine that we all tend to think of all epoxies and superglues as the same - given a moments thought - and reference to this new bible - this is not the case.

The eight appendices contain much of value - perhaps most especially Appendix 3, Cave and Karst Reference List, which includes a full listing of the Australasian Cave and Karst Management Conference Proceedings from 1976 until 2005. Appendix 8, Sample Cave Management Plan: Joe Doe Cave, is also very useful.

All in all - just go out and buy it. And use it so that our cave resources are better looked after utilising the expertise of Val Hildreth-Werker and Jim C. Werker and their many expert colleagues.

A previous version of this review appeared in the Australasian Cave and Karst Management Association Journal, Number 66, March 2007.

### References:

Hamilton-Smith E, McBeath R, & Vavryn D. 1998. Best practice in visitor management. In: Smith DW, editor, Cave and Karst management in Australasia XII, Carlton South, Victoria, Australasian Cave and Karst Management Association. p85-96.

Spate A, Hamilton-Smith E, Little L, & Holland E. 1998 Best practice and tourist cave engineering. In: Smith DW, editor, Cave and Karst management in Australasia XII, Carlton South, Victoria, Australasian Cave and Karst Management Association. p97-109.

## Mystery of the Dark Tower by Laurel Hall

Paperback book AU\$9.91

Download AU\$6.25

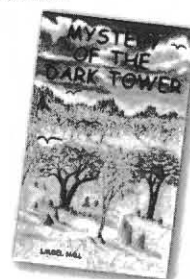
Printed: 144 pages

### Description:

An adventure-suspense novel for 11-15 year olds, it is set in the remote Cape York Peninsula township of Chillagoe and surrounds in Far North Queensland, Australia. The Chillagoe area is famous for its exciting and fascinating limestone towers and cave systems. The most forbidding and menacing of these limestone towers, or Karsts, is 'Mordoor'. The four main characters have stumbled upon a spine-tingling mystery that concerns one of Mordoor's biggest caves - 'Chasm Cave' - supposedly not explorable because of the bottomless chasm that yawns in front of the opening. After many hair-raising adventures in and around Chasm Cave, the four protagonists eventually unearth the surprising mystery.

Publisher: Adam Hall

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## SRTE Stop Descender

A Single Brake Stop Descender converted from a Double Brake beats the Petzl Stop by Peter Freeman



Early in 2005 I resolved upon buying full SRT kit, so a key item to select was a descender. Although I had abseiled many years ago in the life-threatening around-the-body mode, I had never used any modern friction device, so I was starting from scratch. From reading and web research, I decided that the type for me was a double-brake stop descender — in retrospect, not a correct decision. The available models were from SRTE (Australian), Kong (Italian) and Anthron (Slovenian). Petzl do not have an offering in this category.

Online reviews of the SRTE models were all favourable, the only downsides ever mentioned being cost and weight. SRTE descenders were commended for robustness, durability (stainless steel sheaves), heat dissipation and progressive handle action. A key point was that the handle should be used as the primary speed control, with tensioning of the lower rope being secondary. I'll return to that topic, but this is of course the reverse of the Petzl recommendation, where it is warned that holding the handle half-way will heavily wear the rope. The reason for the difference lies in the basic design — a Petzl Stop's brake action is against the lower spool, while the SRTE's brake is between the upper spool and an adjacent post. Braking friction is thus shared amongst all contact points along the rope path. This characteristic appealed to me as a beginner — I wouldn't need to learn the right hand actions as a priority, just the left hand squeeze. In retrospect, this aspiration was also an error.

Of the others units on my short-list, the Kong double-brake model is (I believe) Petzl-like, while the Anthron reportedly has problems with ease-of-threading and pulling slack through it. An additional point is that I was surprised and pleased that Australia is in the caving equipment game, so that we can purchase patriotically!

The decision was therefore made. In mid 2005 I bought an SRTE D1DBa by mail order directly from the manufacturer for \$218.00.

How did it turn out? Well, I immediately encountered a problem when I went to my first and only outdoor SRT training session: 10mm rope was difficult to thread and 11mm almost impossible. Even worse, once threaded they ran ridiculously slowly. This made the whole descent process difficult, and take-off over an edge (when less than full weight is being vertically applied) was a particular nuisance. The position of the top sheave relative to the brakes is adjustable by rotating an eccentric insert, but even at maximum spacing the problem persisted. I was forced to the conclusion that only by removing the second brake shoe would the rope run easily. I did this in the evening after my first practise day, sitting at Homeleigh's (Buchan Victoria) dining table and using tools from the shed. I thereby converted my brand new double brake device into a more

conventional single brake one (this is an approved alteration), and effectively threw away about \$30.00.

Am I happy in forfeiting the second (squeeze-to-stop) brake? Yes. Despite the warning about the instinctive grip-of-death action in a panic situation, I have never felt any tendency that way. It would, of course, still be a nice feature if there was no disadvantage; but I firmly recommend NOT buying the double brake model. If you really want one, I'll sell you the required extra parts at a bargain price!

This modification to single-brake made a huge difference! My next day experience (a trip down M111 Blowfly Pot) of the now-converted descender was a relief and very pleasing. The handle action was smooth and progressive. At this time I was still trying to ignore the lower rope, and so a braking karabiner was not used. I was on 10mm rope, and I got the impression that a fast descent would be easily achieved if desired (hardly the case in M111). The automatic stop was very secure. By the way, locking off by wrapping the rope, if and when required, is similar to other bobbin descenders.

To cater for different rope sizes, pitch lengths, and personal taste in handle pressure and descent speed, two options are available —

1. The eccentric insert mentioned earlier.

However, this in practise makes hardly any difference and altering it requires almost total disassembly of the device, so I recommend leaving it alone. Mine is now set back to the standard position. The SRTE descender accommodates rope diameters from 9 to 12mm officially, but without the second brake shoe and with the standard eccentric setting it will easily take 13mm, and I have used it on 8mm with perfectly satisfactory results.

2. A second post near the down-rope entry point can provide extra friction. The rope may go over and to the right of this post instead below and to the left of it, and this creates a gentle bend in the rope path. You don't need to wrap around this one if using a braking karabiner, but you don't need a braking karabiner if you use this post. It might be useful on ultra-thin rope, or in hauling or rescue situations.

Complaints? The accompanying instruction leaflet is amateurish. The locking-off description is obscure and doesn't seem to match the equally amateurish illustration. But don't worry, because (a) soft and hard lock can be done exactly as with a Petzl, and (b) you don't need to. Also, the directions on altering the eccentric insert are vague and ambiguous. This would be a problem if you're not of a sufficiently mechanical bent to figure it out yourself, and you really felt the adjustment to be worthwhile. However, as already mentioned, the adjustment is a complete waste of time, so this shortcoming is actually no problem.

I initially found the handle to require much effort to hold in, but that was in the days when I was trying to use it progressively. I solved the problem by extending the handle — a short piece of plastic electrical conduit was slid securely most of the way over the handle, extending it by approx 6cm. I know that many users modify the Petzl similarly. My left hand now goes around the handle plus the attachment krab, rather than around the handle and the descender body, and it is very easy and



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**Blue Water, Beal, Bonwick, CMI, Gibbs, HB, Kong, Maillon Rapide, Omega, Petzl, Spelean, SRT, Wild Stuff**

comfortable. A minor downside is that when stopped on the descender, or when it's not in use, the handle protrudes further than before and can be a slight nuisance. Since I no longer try to use the device in a progressive mode, it is possible that I could now dispense with this extra leverage.

To return briefly to the handle usage topic, I did have early visions of being able to control my speed simply by the degree of pressure on the handle. The friction is indeed highly controllable, using just one hand, and this is useful in tight spots or when lining up at rebelay/deviations, or anywhere that you need to descend slowly while checking out your surroundings. Also, the stop action is totally reliable - there is no creep as can happen with Petzls. However, at normal or fast descending speed the traditional control by right hand on the down rope is still essential. If you attempt a handle-half-in descent with any speed, you find that any inadvertent relaxation of pressure will slow you, resulting in a force on the mechanism pushing the handle out further, slowing you further, etc. This positive feedback results in you coming to a screaming stop very quickly. Therefore the technique must be the same as with a Petzl Stop - handle fully in and control by the right hand, preferably using a braking krab on your harness maillon.

Am I happy with my purchase? Yes. As now converted it's great. Its biggest advantages over the Petzl Stop are -

1. Progressiveness
2. Longevity of running surfaces
3. Good heat dissipation
4. Absolutely slip-less stop without locking-off by rope-wrap

Disadvantages, all minor in my view, are -

1. Higher cost
2. Heavier
3. Bigger
4. The openable gate in the karabiner hole, to allow one cheek to swing open while threading the rope, is slightly fiddly.

#### Conclusion

I bought it for the wrong reason, but I love it and recommend it.

#### Reference

Model is SRTE D1a Single Brake Stop Descender (converted from an original D1DBa Double Brake version)

SRTE web site is [www.SRTE.com.au](http://www.SRTE.com.au)

Direct sales web site is [www.Onrope.com.au](http://www.Onrope.com.au)