CAVES AUSTRALIA

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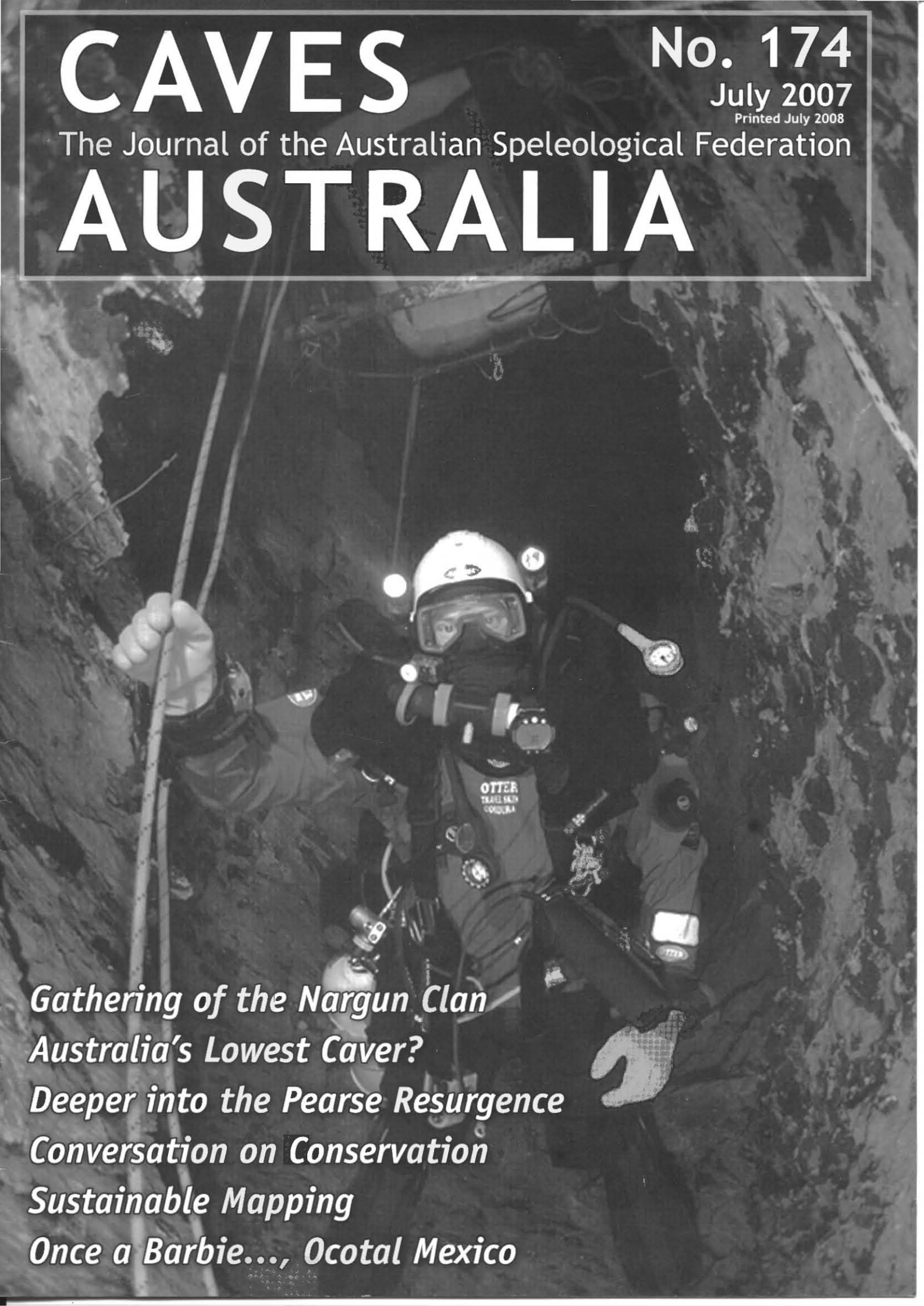


Gathering of the Nargun Clan
Australia's Lowest Caver?
Deeper into the Pearse Resurgence
Conversation on Conservation
Sustainable Mapping
Once a Barbie..., Ocotal Mexico

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 interested in any listed events, Elery Hamilton-Smith: <elery@alphalink.com.au> or Nicholas White, (Chair of the International Commission) nicholaswhite@netspace.net.au may have further information. The relevant websites also are useful. Details of other regional/ local overseas events can be found on the UIS/IUS website http://www.uis-speleo.org/.

2008:

August 17–20	Inaugural Global GeoTourism Conference, Esplanade Hotel, Fremantle WA. For details visit http://www.promaco.com.au/2008/geotm/
August 23–30	VERCORS 2008 - European speleological gathering, including IVth European Speleological Congress, Lans-en-Vercors, Isère, France http://vercors2008.ffspeleo.fr.
September	1–5 XIIIth International Symposium on Volcanospeleology, Jeju Island, Korea Contact: Dr Kyung Sik Woo Email: wooks@kangwon.ac.kr
September	15–17 ALCADI 2008, International Symposium on Speleo-History in the Alpine, Carpathian and Dinaric Regions (up to the First World War), Baden (Lower Austria), Austria Contact: Karst - und höhlenkundliche Abteilung des Naturhistorischen Museums Wien, Museumsplatz 1/10, A 1070 Wien, Austria. Email: speleo.austria@netway.at. Details: http://network.speleogenesis.info/directory/events
September 21–26	19th International Symposium on Subterranean Biology, Western Australian Museum, Fremantle WA. http://www.issb2008.org.au/index.html for details.
September 22–26	11th Multidisciplinary Conference on Sinkholes and Karst, Tallahassee, Florida, USA http://content.asce.org/conferences/KARST08
September 26–28	Hidden Earth, the UK's annual caving conference, hosted by the British Cave Research Association and the British Caving Association for the benefit of all cavers at Otley, West Yorkshire. For details see http://hidden-earth.org.uk/

2009 and beyond

January 4–9	27th ASF Conference Gippsland Victoria. Pre- and post-conference trips as well. All enquiries to Marg James margpj@yahoo.com.au or go to http://www.caves.org.au/conf2009/ Details in this issue of *Caves Australia*.
May 3–9	ACKMA Conference, Margaret River, Western Australia. Convenor: Anne Wood. http://www.ackma.org/
July 7–12	ANZ IAG International Association of Geomorphologists Conference, Melbourne. A karst session and some karst field trips will be run during this conference. For details contact Susan White Email: susanqwhite@netspace.net.au http://www.anzgg.org/melbourne2009.htm
July 19–26	15th International Congress of Speleology, Texas, USA organised by the NSS. For the latest details see http://www.ics2009.us/

SPELEOLOGICAL ABSTRACTS

BULLETIN BIBLIOGRAPHIQUE SPELEOLOGIQUE

The 2005 issue of Speleological Abstracts, published by the International Union of Speleology's Commission on Bibliography, should be available shortly.

The previous edition, a combined 2003-04 issue, was published by IUS in July 2005. It contains 6,475 abstracts of articles about the world's caves and karst, 680 of them relating to Australia and/or New Zealand.

This double issue is available in hard copy or searchable CD, each costing 50 CHF (Swiss Francs) - currently A$50 + 32 CHF ($A32) postage for the hard copy or 2 CHF for the CD. Hard copy + CD are 90 CHF including postage.

A 17 year CD-ROM (1988-2004) containing 77,000 abstracts is available for 220 CHF.

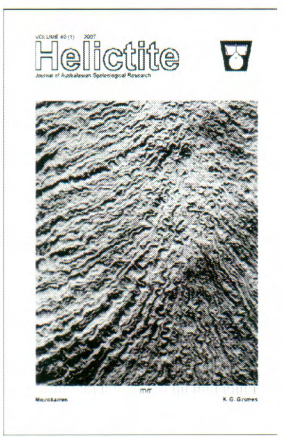
Orders can be placed through the web at: www.isska.ch/bbs

Or to: E. Shield, Village Farm, Mill Lane, Great Thirkleby, North Yorkshire, Y07 2AT, UK - in which case the cost is £23 (= A$50) including postage (save A$32).

INSIDE HELICTITE

Volume 40, Number 1, 2007

OUT NOW



Published October 2007 by ASF Inc.
Edited by Susan White,
Ken G Grimes,
Stefan M Eberhard.
24 pages.

- Editorial by Ken Grimes and Susan White.
- The abode of malevolent spirits and creatures — Caves in Victorian Aboriginal social organisation.
- Tectonic and Talus Caves at Pilchers Mountain, New South Wales.
- Microkarren in Australia - a request for information.
- Extended Abstract: Cavernicole diversity and ecology in Tasmania.

WANTED
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Whether caving, cave diving or 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.

CAVES AUSTRALIA

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

As no issues of* Caves Australia *were able to be published in 2007, the publication dates will include the actual dates the issue is produced.

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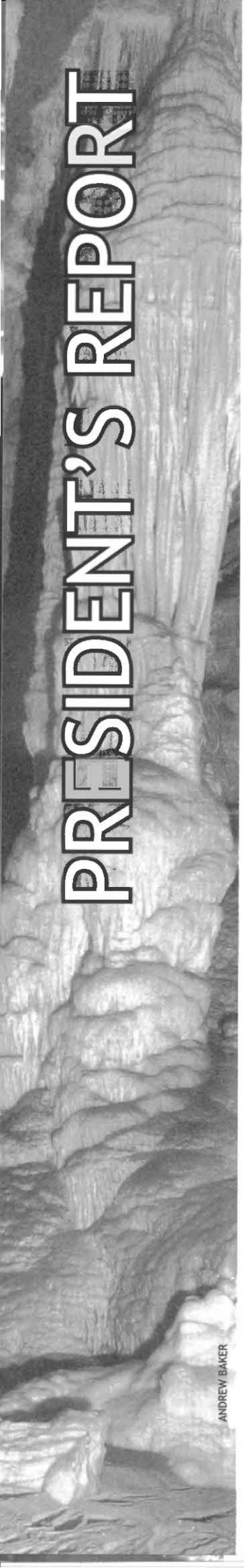
COVER: Craig Howell below the habitat in the Nightmare Crescent, Pearse Resurgence, NZ. Photo by Richard Harris

Layout and production: Summerleas Print



ANDREW BAKER

President's Report

CHANGE is inevitable in our lives. Sometimes it is planned; sometimes it sneaks up from behind. We may resist change on some occasions and at other times we embrace it and move forward.

2007 was an important year to mark the progress and celebrate 50 years of ASF.

It is timely to review and build on the past and create our future by making necessary changes. This Federation needs to move forward, update and upgrade and be even more effective in delivering the goods in 2008.

In January, I and many others attended the ASF Council meeting in Sydney where as usual we read, listened to and discussed reports and formulated a number of actions and plans for current and future business of ASF. As usual these meetings inspire and help give us direction and purpose. The hard work comes in the implementation of plans and projects and keeping the energy infused in all.

A theme that was apparent is that we need to see the personal element in all we do and plan. Caving is largely about people and caves. We have invested wisely in programs, documentation, policies and conservation issues and have won and lost battles with cave owners and politicians. We are all a bit wiser, older and more fragile for it.

It is now time to invest in and support the things that form the common thread amongst us all: our love of caves and our passion for exploration of the "beckoning darkness". We need to consider what ASF needs to do for current and future cavers. We need to be unified in our interaction with other cavers, with cave managers and with the traditional owners of caves. We will need to develop policies and share knowledge with others to maintain and protect caves and our access to caving areas. Most importantly we need to introduce other people to the passion of what we share in finding, exploring and managing caves.

So this year the Executive will be working towards strengthening and developing a number of critical areas:

- Cooperation and collaboration with State and national bodies with the interchange and protection of karst information and knowledge to enable better management of, and controlled access to karst features.
- Developing policy that will help cavers and traditional landowners work together and promote a deeper understanding of the importance and significance of karst features to each other.
- Completing existing projects and campaigns and starting new programs pertinent to the conservation and protection of caves.
- To publish new findings and maintain existing publications in ways that information on caves and cavers is available and accessible in an efficient and appropriate fashion.
- To encourage and assist the working parties, councils and commissions of the ASF.
- To review, promote and disseminate the aims and policies of the ASF to member clubs.

As President, I will preside over and support the ASF in business matters and actions. However, inside me there is more importantly a person who likes to explore and document caves, who likes to harness the passion of fellow cavers to do the same and promote the feeling of unity. I have felt the pain of a great number of cavers in issues complex and deep; let us reconcile, move on and get underground again.

In Caving,
Stan Flavel

Inside ACKMA Journal March 2008

- President's Message *by Steve Bourne*
- A Brief History of the Cave Guides Gabfest *by Kent Henderson*
- Rawhiti Caves *by Jane Baird*
- More about Cango Caves *by John Dunkley*
- Letter to the Editor *by Alan Griffin*
- Karst & the Tasmanian Geoconservation Database *by Rolan Eberhard*
- Naracoorte Bats listed as Critically Endangered *by Steve Bourne*
- Research into Australian Rainfall Records based on Cave Deposits *by Nicholas White*
- Reflections on the nature of guiding *by Dan Cove*
- A Colossus Retires *by Kent Henderson et al.*

For more information about ACKMA, please visit:

www.ackma.org

FROM THE EDITOR

With a new publication team in Tasmania up and running with issue 173 under their belts, we are moving towards getting *Caves Australia* back on schedule as a quarterly publication. A warm thanks to previous team members and patient article authors who have assisted in *CA* 174 coming together.

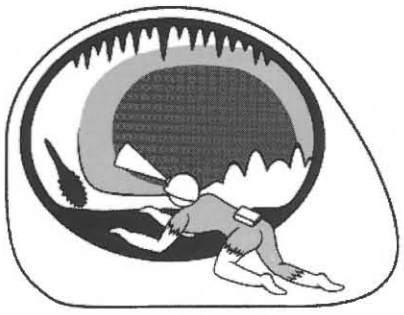
'Down Under All Over', a section highlighting major club events, is now a regular feature with milestone events featuring VSA's 40th celebrations this issue and SUSS's 60th coming in a future issue. We are also looking for pieces promoting significant caves in your area, with enough detail on how to organise a successful trip to entice interstate clubs to come and visit your region.

'Conversation on Conservation' commenced this issue and we are keen to hear your suggestions and ideas for contributions under this ever increasing subject area.

Current article closure dates:
CA 175 Closed
CA 176 30th July 2008
CA 177 30th August 2008
Regards, Ed.

Karstaway Konference

27th Biennial Conference of the Australian Speleological Federation 4—9 January 2009
Hosted by the Victorian Speleological Associaton, the Caving Club of Victoria and others



THE biennial conferences of ASF have always been a way of meeting other cavers, sharing speleological experiences and ideas and seeing some cave and karst areas outside your own patch. Organisation is now well advanced for the next ASF conference from 4th to 9th January 2009, which will be held at Gippsland Grammar School in Sale, Victoria. Sale is the closest town to the karst areas of East Gippsland capable of holding a conference of this size during the summer holiday period.

Pre and post conference trips are envisaged to places such as Buchan, Limestone Creek and some of the other small karst areas in Gippsland.

The program will include

- Welcome BBQ hosted by Wellington Shire Council on Sunday 4th January
- Pre & Post Conference trips
- Guidebook, Precedings
- Papers and presentations
- ASF Council meeting
- Caveman's Dinner at the Greyhound Racing Club
- Photographic Display
- SpeleoSports and other similar competitions
- Workshops including Cave Art, Conservation, Cave Rescue, Youth Groups & Caving and others
- Social Activities
- ASF Commission and Working Group meetings
- Auction
- T Shirts and other memorabilia

The registration form is is included in this issue. Additional copies are available from the conference website (http://www.caves.org.au/conf2009) with links from the ASF website and Victorian club websites. Limited hard copies will be posted to ASF clubs.

This should occur over the next couple of weeks. Registration should occur as soon as you can and be sent to:

ASF Conference 2009, PO Box 2277, Mount Waverley VIC 3149

Accommodation

Because there is no on-site accommodation available for this conference, arrangements for motels, cabins, or camping etc are NOT included in the conference fee. Sale (Victoria) is well serviced with motels and self contained cabins as well as a very cheap camping option. Our conference, however, is being held in the peak tourist season and we are advised that availability will be very low, and costs will be higher. Search for accommodation in Sale at http://www.gippslandinfo.com.au/accommodation.asp

There are two options and details of these are on the registration form:

Showgrounds camping – 100 m from the conference venue @ $15 per night. BYO tent or van, powered sites available. Hot showers and toilets.

Motels and cabins – We have made arrangements with the Wellington Shire Visitor Information Centre for discounted accommodation ($45.50 per person per night twin shared motel and 4 shared cabin rooms) for people coming to Sale for our conference. These discounts are only guaranteed if bookings are made before July 1st. A deposit will be required to confirm your booking, with full payment by October 1st. For this option phone the Sale Visitor Information Centre on (03) 5144 1108 and state that you are attending the ASF conference and wish to book motel (cabin) accommodation. Ask for Mark Watson (manager) or Sue van der Heide (assistant manager). Payment is directly to Sale Tourist Centre or the motel.

More details about the program and activities will be circulated in the next *Espeleo*, as well as on the website http://www.caves.org.au/conf2009.

Karstaway Photographic Display

CONFERENCE participants are invited to submit cave and/or karst related photographic prints for display at the conference venue. For this conference it is not intended to have a formal photographic competition with outside judges, as in the past.

It is however proposed to enable conference attendees to vote for the photograph they like most in each of a number of categories, and that prizes will be awarded for the picture gaining the most votes in each division.

Provisionally the categories are: surface karst/cave entrances; underground action; cave passages/pitches; speleothems.

This may be varied by the conference organisers depending upon the actual number of prints made available for display and their subject matter. A maximum of five photographic prints may be offered for any one category per entrant.

Persons intending to submit photographic prints for display at the conference are requested to indicate the number of prints either at the time of registration (preferred), or in writing to the conference official address (postal or email), not less than one month prior to the event. Late submissions may not be accepted.

Photographic prints should be A4 size mounted on a stiff cardboard backing. It is envisaged that adhesive Velcro spots will be attached to the back of mounted prints so as to enable placement on standard fabric covered display panels.

Exhibitors of photographic prints may offer them for sale at the conference. In this case, a 'For Sale' sticker with the asking price is to be supplied by the vendor for display with each print. It is also expected that if prints are sold at the Conference, or as a consequence of display at it, a 10% commission will be remitted to the conference organisation.

Persons who have given the requisite prior advice of their intention to submit photographic prints for display at the conference are to bring the prints with them to the conference venue and hand them to the conference organisers at the registration desk.

All prints must have a permanent marking to denote the submitter's name. The conference organisers will arrange for the placement of the items on display stands etc.

The conference organisers will take reasonable care in handling and displaying the items, including having them secured in a locked room/building when unattended at night, however claims for loss will be limited to that available under the conference insurance arrangements.

At the conclusion of the conference, the owners of the photographs/artworks will be responsible for collecting them from the conference organisers before departure.

DOWN UNDER ALL OVER

Gathering of the Nargun Clan

Celebrating the 40th anniversary of the Victorian Speleological Association

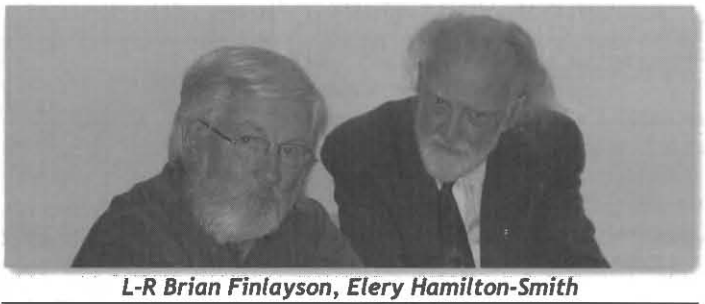
Brooke Grant

THEY CAME From Them There Hills... and Holes. A bar, food and cavers - no better way is there to start a night of friendship and stories. We met for dinner March 1st 2008, in central Melbourne at Cooper's Inn to celebrate more than 50 years of organised caving in Victoria and the 40th anniversary of the Victorian Speleological Association (VSA). About 60 of our current and previous members were there including cavers from as far a field as Brisbane, Gold Coast and Sydney.

L-R Daryl Carr, Peter Robertson, Wolf Kahrau

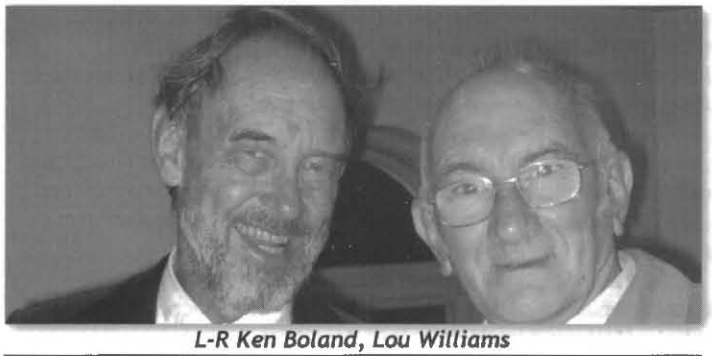
The association was born in 1967, on June 8th. We postponed the 40th anniversary dinner a few months because everyone was too busy caving and doing other speleological activities back in June 2007. The association came from the merger of two earlier Victorian caving groups: the Victorian Cave Exploration Society (VCES) (formed 1957) and the Sub Aqua Speleological Society (SASS) (formed 1958).

VSA today has several members who have more than 20 years with the club, many of whom were with us to celebrate in March. Five of our foundation members are still with us: Elery Hamilton-Smith, Peter Matthews, Daryl Carr, Nicholas White and Peter Robertson.



L-R Brian Finlayson, Elery Hamilton-Smith

Alex Kariko, club secretary, hosted the evening and introduced Elery Hamilton-Smith, our first speaker for the night, after the president's rave by Marg James. Elery gave us new-kids-on-the-block an interesting pre-history lesson on the events leading to the formation of the VSA, including reference to a scout jamboree back in 1954. He also gave credit to Robin Bailey and Wolfe Kahrau for the development of the Nargun logo, our association mascot.



L-R Ken Boland, Lou Williams

PHOTOS COURTESY OF FIONA NITSCKE AND BROOKE GRANT

L-R Georgia Bennett, Program Organiser Tom Aberdeen and President Marg James

Elery highlighted that the VSA and its predecessors were not just about caving for individual gain, but about conservation as well. He explained how good caving practice was developed. This had been highlighted in the commemorative *Nargun* with a letter by Elbert Bassham, a VSA member when he was an International Teaching Fellow from El Paso, Texas. Elbert highlighted the cave conservation strategies used to initially protect a newly found & pristine section of Scrubby Creek cave at Buchan. (Reprinted in *Nargun*, Volume 40 No. 3, March 2008)

Alex Kariko & Peter and Margot Matthews remembering Who's Who with the Photo Library.

Between courses club members mingled, catching up with old acquaintances and for some of us newbies a chance to spend a little more time meeting the 'names' of the VSA and hearing stories of how caving used to be done. A few photos were shared around as well. We were all given a colour copy of the VSA history poster, courtesy of Miles Pearce, that won the poster competition at the last ASF Conference in 2007. [Reprinted in *Caves Australia*, Issue 173].

The final event was a PowerPoint presentation by Ken Boland on VSA's involvement on the Nullarbor since 2002 using light aircraft. A fascinating insight into the on-ground, and aerial survey and mapping techniques, used for the relatively unexplored areas of the Nullarbor. BLUE BUSH!!! (I can hear the experts on the Nullarbor going "Uugghh" now). What patience and dedication has been shown year after year, with the methodical aerial, followed by slow and meticulous ground searching, with the ground crew currently running years behind Ken's aerial survey. The 2002 discovery of an intact, ancient *Thylacoleo* marsupial skeleton made national and international headlines, advancing Australian palaeological and natural history.

The Victorian Speleological Association has a broad spectrum of members with interests in sports caving, exploration and science.

Come on down and see us sometime...

"The Nargun" - a half stone, half flesh, cave-dwelling native spirit described by Aboriginal guides to A. W. Howitt during a geological expedition to East Gippsland in 1876.

■ Thanks to club secretary Alex Kariko, and his wife, Phillipa, for organisation of the night and making it run smoothly.

Australia's Lowest Caver?

How I set an obscure record

Stephen Bunton

IT WOULD be hard to decide who is Australia's top caver but I would like to put in a claim to be "Australia's Lowest Caver". After reaching the lowest point in Tachycardia (-375 m) in early April 2007 I realised that I had set some obscure record. Not by virtue of any great skill but more by virtue of the fact that I've been doing deep caves in Tasmania for over three decades. Over this time I have been lucky enough to have bottomed each of the last five of Australia's deepest caves whilst they were the deepest.

My adventure started in 1976 when bottoming Khazad-dum (-275 m) was seen as a respectable challenge for aspiring vertical cavers from Sydney. We flew down over the Easter long weekend and spent Friday night camped in Exit Cave as part of a survey group organised by Tony Culberg.

The following day we raced through to the Grand Fissure before heading out of the cave and then driving to Maydena. Next morning, we were shown the entrance to Khazad-dum (KD) and left to our own devices.

Graeme Smith, David Stenson and I had never done anything like this before. David never did anything like it (nor went caving) ever again – that I know of. For Graeme and I, it was training for the upcoming Atea 78 and Mamo 82 expeditions to Papua New Guinea.

Out of our depth

The three of us were out of our depth but quite determined and we pulled it off despite the fact that we were out of light as well. Walking back through the misty rainforest at midnight, with the dim remains of the one functional torch between us, will always stick in my memory, as much for the smell of the rainforest, which somehow weaved a magic spell upon me. I knew I would return. (Eventually I did, ten years later when I decided to reside in Tasmania.)

After a 12-hour trip the three of us were so stuffed that the next morning we slept in and got to our plane late. I checked in the old rucksack, which weighed 80 pounds, no "Heavy" tags in those days. We hadn't contemplated the increased weight of wet rope nor the fact that muddy water dripped out of it as I carried it into the TAA terminal! We didn't even think of a plastic garbage bag! Were they invented then? Somehow we charmed the airline staff or they took pity on us and we flew home on a later flight in the only available seats, in First Class.

I returned to Tasmania a few times during the May school holidays over the next few years. Over this period I did a few more great caves but the most notable sojourn was over the summer period of Christmas 1983 and January 1984. At that stage most of our cave descriptions were gleaned from a manilla folder, owned by Alan Warild, which was full of photocopies of old journals.

STEPHEN BUNTON COLLECTION

Significantly, I remember it had "Mental Health" printed on the front of the folder.

After those few months I worked with Rolan Eberhard and we sourced the original maps. We put together all the rough notes into a format that was published as *Vertical Caves of Tasmania - A Cavers' Guidebook*, late in 1984.

Ice Tube to Growling Swallet

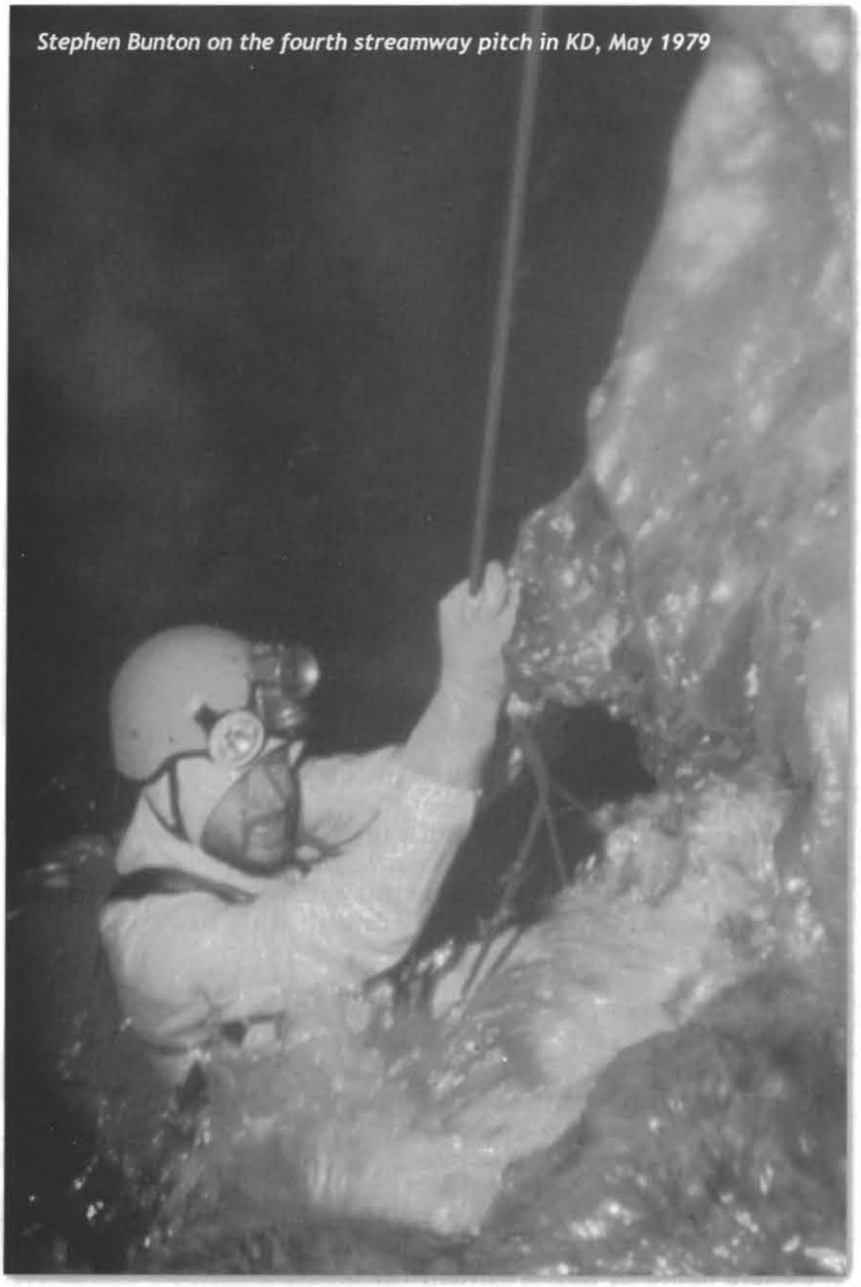
One of the big trips of that summer included the first Ice Tube - Growling Swallet through trip. This was a very committing undertaking.

Ice Tube had only been done previously as a bounce trip. Alan Warild had discovered the connection through from Growling Swallet up Mothers Passage, but no-one had been crazy enough to pull their ropes down for a descent of the aptly named Ice Tube. If we stuffed up or couldn't get through into Mothers Passage it would be a very cold wait for the rescuers.

"Hands up all those who want to die." Nick Cave (how appropriate?) blurted from Stefan Eberhard's car stereo as we trogged up. Together with Rolan, Trevor Wailes, Nick Hume and Phil Hill, I would bottom the next deepest cave in Australia. I had already been to the deepest point at the end of Mainline (which with the connection took the depth to 356 m).

These days the deepest point lies 15 m underwater in a sump called Coelacanth. My memory of the through-trip is indelibly etched with the fact that, after two months of solid caving, my tackle bag burst in the confines of Windy Rift and spilled much of its 100 m rope. Wrestling with this eviscerated monster in the middle of a squeeze took so long that those ahead of me had returned to the car and got changed before worrying sufficiently to return to the entrance to investigate where I'd got to.

Australia's Lowest Caver?



Stephen Bunton on the fourth streamway pitch in KD, May 1979

STEPHEN BUNTON COLLECTION

A mystery caver

The other big trip of that summer included pushing the Desiccator section of Anna-Kananda (-373 m) with a Canadian caver called Dale Gilliat. The extension called Rocky Mountain Way was later connected into the main part of the cave. This trip was done as a mini-expedition with Phil Hill, Geoff and Ev Innes camping in the entrance doline. My recollection of this was getting my bolt drive stuck in the rock and belaying off it even though the bolt was not set.

When the anchor was found twenty years later this posed a mystery, which was partially solved when I owned up but posed another when we realised the driver had been taken. Who had been there in the meantime?

The frenzy of cave exploration that followed the publication of *Vertical Caves of Tasmania* meant that it became outdated pretty quickly. That meant I had unfinished business to do. I tried to keep up with all the new exploration by systematically doing all the newly discovered caves.

A wait to bottom Niggly

Somehow I never managed to stay on the pace of discovery. Niggly Cave (-375 m) was discovered and pushed in 1990 whilst I was recovering from a broken leg sustained playing soccer and then Tachycardia (slightly deeper, but still rated at -375 m) was pushed during 2006 whilst I was abroad on Long Service Leave. In fact, whilst I have had good success finding things on overseas expeditions, I have never really found much good cave in Tasmania.

It would be ten years before I was to bottom Niggly Cave. This involved a number of trips to siege the cave. First we had to relocate it and clear the regrowth over the track.

Then we had to take the 200 m rope up to the entrance so that the 191 m Black Supergiant pitch could be tackled. We then rigged the entrance series and the long pitch. Finally Rolan and I did a push trip to the bottom. This was Rolan's third push trip in the downstream rockpile, which blocks the cave after over a kilometre of large streamway. For me it marked only the halfway point of the trip. Ahead of us was the long trip out. We prusiked the big pitch tandem which was very sociable. After another trip to de-rig the cave, the long rope Rolan and I had both hung from was drop-tested as a part of STC's ongoing maintenance and replacement program. It broke first trial!

Heading for Tachycardia

I planned to celebrate my 50th birthday in April 2007, by again bottoming KD, my favourite all time cave. It would be the eighth time! In the meantime the opportunity to do Tachycardia arose. So I dragged my aging and flaccid body off the couch and "knocked the bastard off."

I was escorted to the bottom by Alan Jackson. Alan was one of the main activists during the cave's exploration. He had the cave pre-rigged such that they could continue pushing leads somewhere in its considerable depth.

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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!

The fact that we didn't have to de-rig the cave either should have made this a rather cruisey outing... but Tachycardia is not like that! Tacky, as it is affectionately known, has a reputation as a hard cave. It is all squeezes through boulder piles or dicky climbs, on rock that probably isn't bedrock, before the guts drop out of it in the 170 m Bermuda Triangle pitch.

I wasn't too concerned about bottoming the cave, abseiling is easy; getting out again would require the guts and determination!

The 170 m pitch is thankfully rebelayed at a number of convenient points to keep the rope out of the dripping water. Again this made for a rather sociable outing as Alan and I swung from rebelay to rebelay.

The main danger was the friable "rock" or mud or whatever it is and the number of falling cowpats that descend from above and whistle past, disappearing into the black depths below. You don't hear them crash-land since the rock is so sqidgy. It is no surprise that when the cave was first explored and the odd depth-tester was dropped down the shaft, there was no resonant boom when they hit the bottom. The rocks just disappeared into the blackness hence the appropriate name; Bermuda Triangle.

In the end, I survived, despite being less than cave fit. I have ticked off another cave on my "must do" list and I can pass judgement on it for any future edition of *Vertical Caves of Tasmania*. In the end I considered that it is a good, challenging but disgusting cave. There are no easy metres to be gained.

Affectionately known as Tacky, it is just that; "a poorly constructed substitute" for a real cave. It offered so much on the map; like a true vertical cave its depth exceeds the plan length but unfortunately the quality just isn't there!

Trying to keep pace

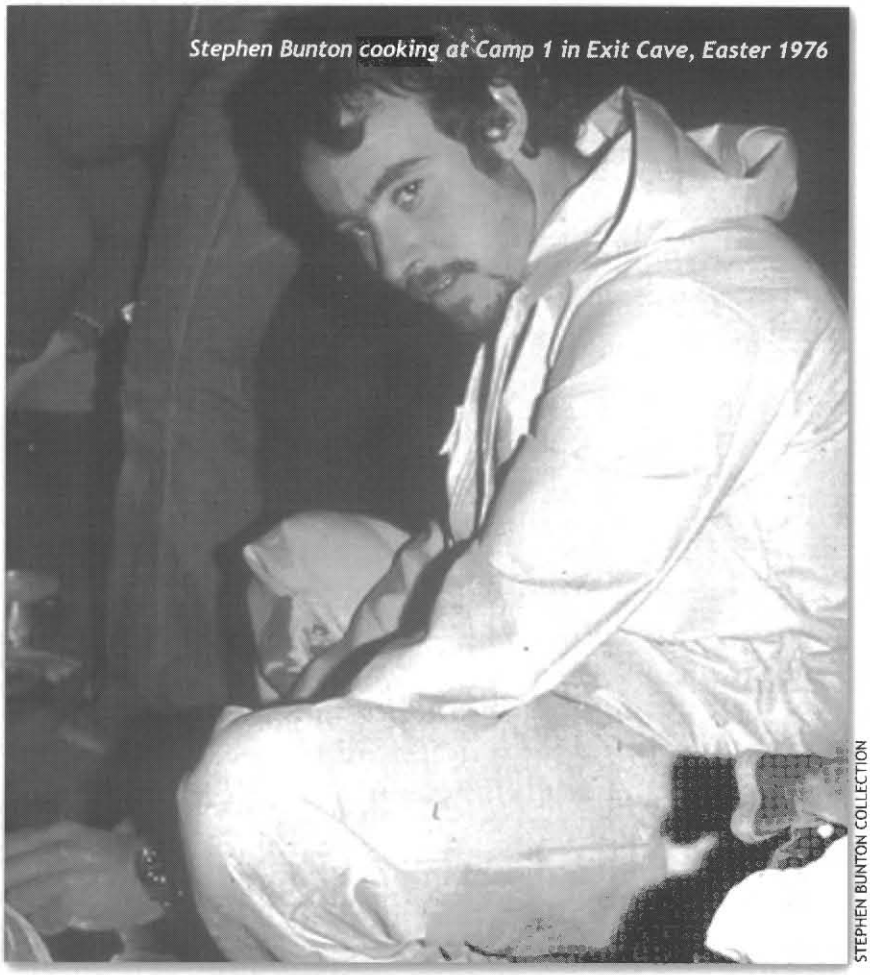
The good thing about caving is that with continued exploration caves get longer and deeper. New caves displace old caves on various lists and records get broken.

Trying to keep pace with these ever changing deepest caves has been a worthwhile challenge throughout my caving career. I hope that they find some new deeper ones to maintain the challenges but I also hope they find them soon. If they leave it too long I won't be up to it!

The best outcome would be for Niggly Cave and Tachycardia to be connected and this would solve the deepest cave dilemma.

Tachycardia's entrance is 8 m higher than Niggly's entrance and they both form part of the Junee master cave, the hidden secrets of which are gradually being revealed.

Whoever does the first Growling Swallet to Junee Cave through-trip can then take over as Australia's lowest caver, having visited all of Tasmania's truly low points.



Stephen Bunton cooking at Camp 1 in Exit Cave, Easter 1976

STEPHEN BUNTON COLLECTION

Robe River Creepies — another case of Economics vs Environment in WA

APRIL 2007 saw a heated public debate re the balance of economic decision making versus environmental protection in Western Australia. Five species of troglodític fauna, all previously unidentified were found during an Environment Protection Agency study of the Robe River Mining Company Mesa A project. This expansion of mining in the Pilbara region was halted at the time by the EPA recommendations.

"WA is one of the 34 most "biodiverse" regions in the world. Just the southwest of the state has more plant species than Britain and North America combined. Some areas of the state - such as Mount Lesueur - have more than 100 species per 100sq m, whereas other parts of the world consider 30 species per 100sq m a high level of species diversity."

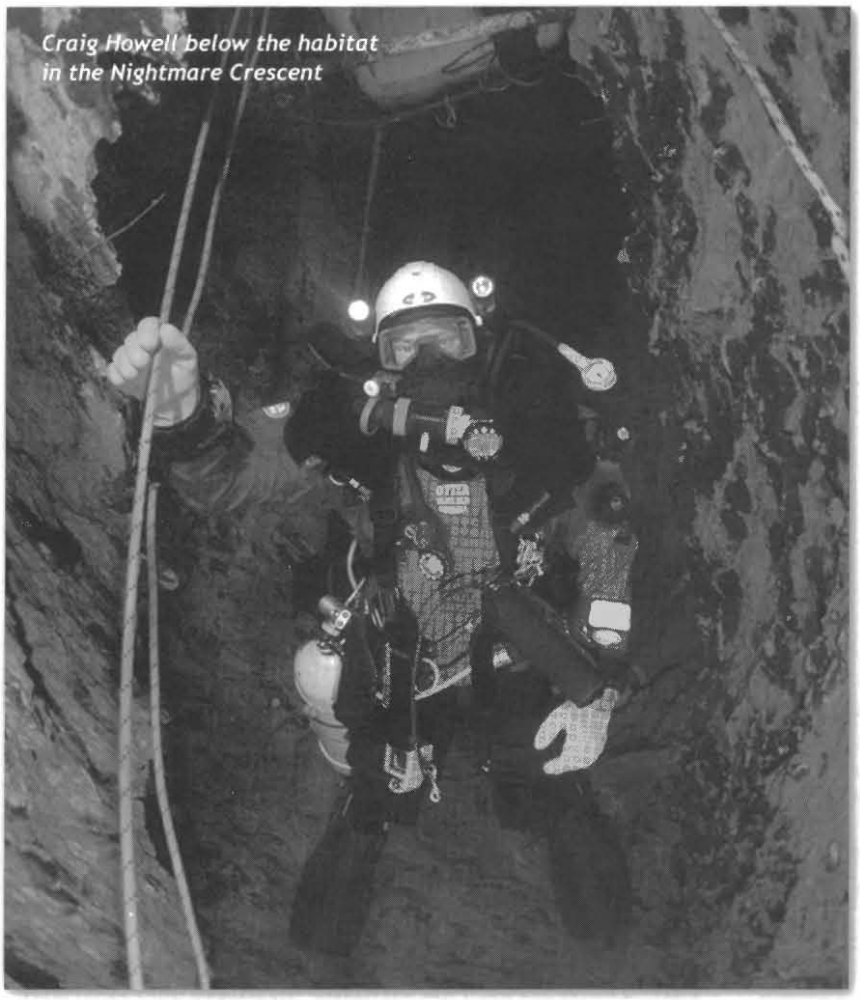
At the time, the EPA found the mining exclusion zone insufficient to protect the "so-called" false scorpions. The invertebrates, known as schizomids, are just 4 mm long and live 5-30 m below the ground, in caves and tunnels within the ore body. Relics from a time when Australia was covered in rainforest, the creatures have no eyes or pigmentation and cannot survive above ground."

The WA EPA has had several years experience now in being on both sides of the environmental fence when it comes to mining project evaluation and recommendations. "...as the head of the EPA [at the time] has pointed out, the state Government makes the final decision and takes into account social and economical factors."

Speleological activities give ASF members opportunities to be involved in expanding environmental knowledge. Investigations, like these of subterranean natural environments, should be seen as an area where cavers may be able to offer proactive involvement. It also brings the complex issues of exploitation versus protection up for discussion. It is not always easy to balance the two and the solutions are not simple.

SOURCE: *The Weekend Australian*, March 31st 2007, Page 39.

Deeper into the Pearse Resurgence



Craig Howell below the habitat in the Nightmare Crescent

IMAGES: RICHARD HARRIS

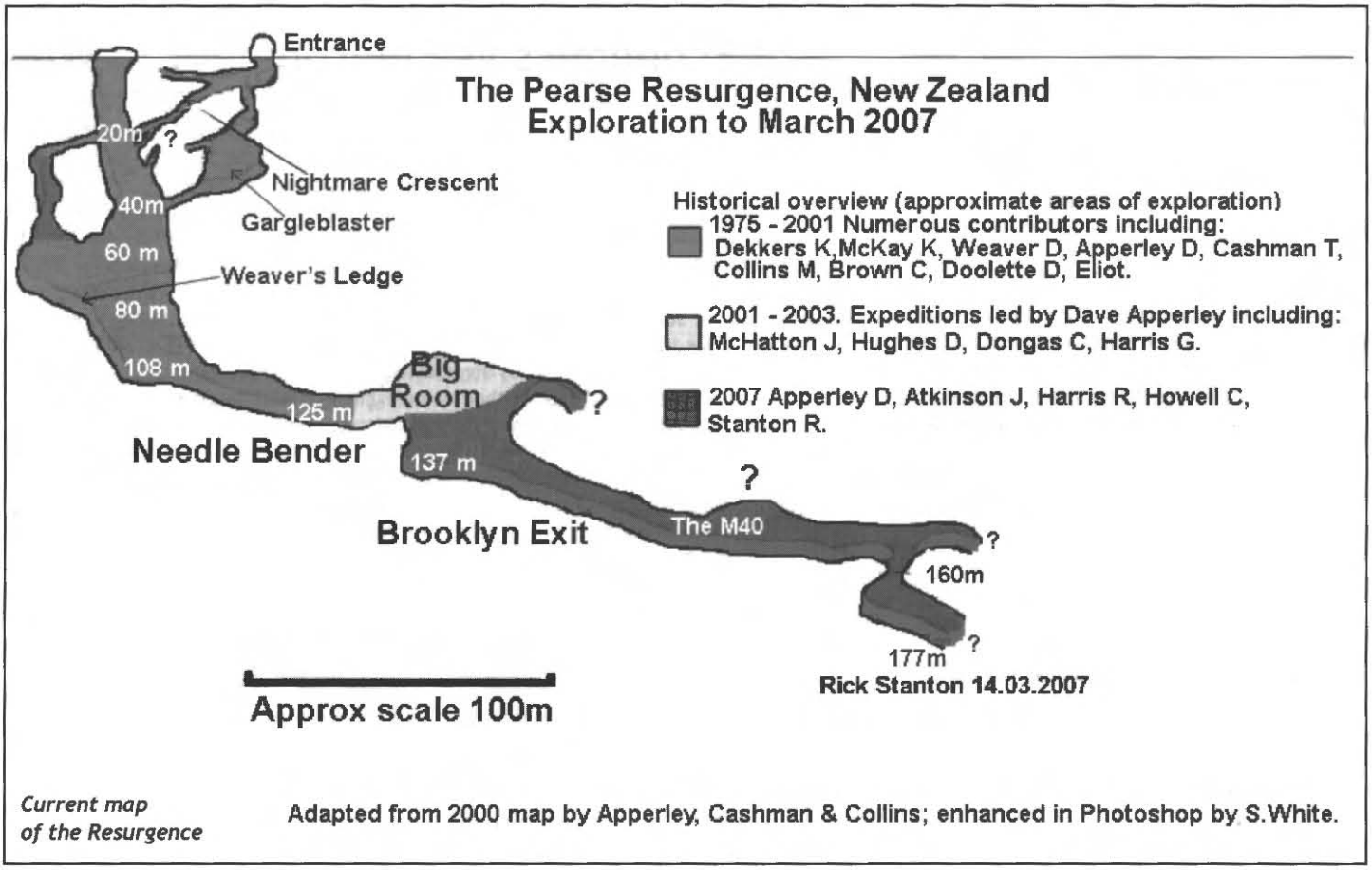
Richard Harris and John Atkinson

THE GREY-WHITE marble passage finally ends at nearly 160 m with another abyssal shaft dropping down into the blackness! Rick and Dave alternately push the deeper section of the cave laying 6 mm line from an improvised reel; the dives leap frogging to 157 m, 160 m then finally Rick's astonishing, record breaking dive to 177 m...

The age of international travel is amazing. Just 25 hours after leaving Adelaide in South Australia, I am in a helicopter touching down in the remote Pearse Valley; a few hundred metres from the resurgence of the Pearse River. Over at the camp, Dave Apperley (Australia) and British cave diver Rick Stanton watch with interest as Craig Howell, John Atkinson and I unload the chopper and move aside as it departs, leaving us in the glorious wilderness of the Kahurangi National Park, New Zealand.

We are here to dive the Pearse Resurgence, currently the deepest and one of the most challenging water filled caves in Australia and New Zealand. With water temperatures of 6-7 degrees Celsius, periods of high flow and the stigma of a diving fatality in 1995, the cave presents as much of a psychological challenge as it does a physical one. With my regular dive sites between 12 and 20 degrees, the icy water was playing heavily on my mind!

Progress in the cave has been hard won over the years. Keith Dekkers, Kieran McKay, Dave Apperley, Tim Cashman, Chris Brown, David Doolette and others have made incremental advances since the cave was first dived in 1975.



Current map of the Resurgence

Adapted from 2000 map by Apperley, Cashman & Collins; enhanced in Photoshop by S.White.

Deeper into the Pearse Resurgence

We feel that we have come well prepared to push the cave. Dave Apperley is a veteran of numerous expeditions here and has developed excellent systems for exploration. A habitat is installed in an early section of passage at 6 m in which divers can decompress in relative comfort. Surface supplied oxygen fed into the habitat means the divers can optimise their decompression, and the Otter dry suits and Typhoon heated vests will help keep us warm for the last two hours on big dives. With the exception of John Atkinson who will be doing shallower dives, we are all using mixed gas closed circuit rebreathers.

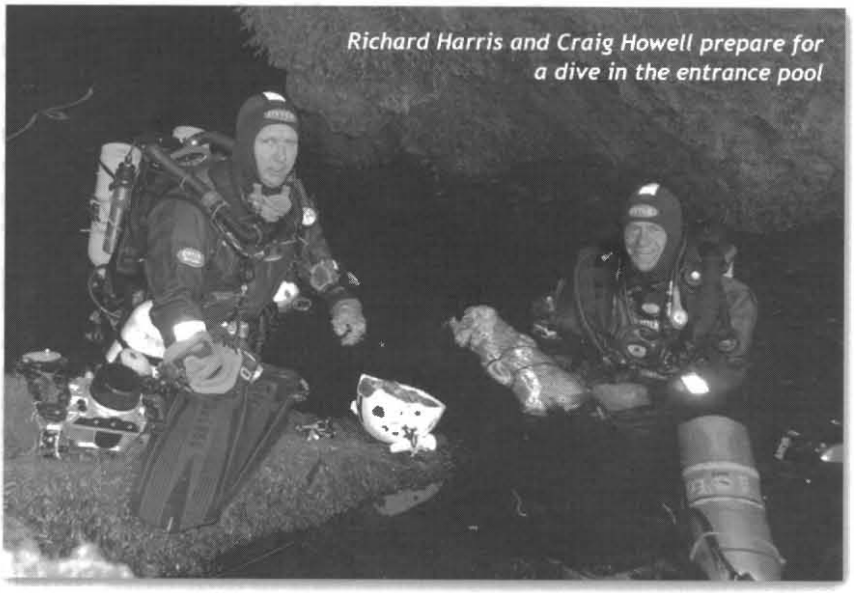
So after 24 hours of travel and very little sleep en route, Craig, John and I set up camp. We join Dave and Rick to catch up on their progress. Dave has spent the last couple of days setting up the camp and preparing the habitat while Rick has been caving on the well known Nettlebed Cave through trip with some locals. John feels fresher than us so decides on a dive before dinner to stage 2 tanks for the team.

A recent flu had caused John to delay his arrival in the Pearse but he feels completely recovered now. He dons two 12-litre side mounts and follows the line into the Nightmare Crescent and down into the shaft to stage the two tanks at 36 m. He feels warm and comfortable in the cave and is starting to admire the beauty of the site, when at 23 m he suddenly starts to feel unwell...

Back on the surface Dave and then Rick descend into the cave on their dives. The absent stage bottle is probably noted but as the planned dives were not deep or long, little concern is raised. Craig and I are still settling in to camp and only start to become concerned about 90 minutes after John commenced his dive. We are acutely aware of John's limited air supply, but we are reassured by the fact that the other two divers have recently entered the cave, and feel that if a problem has developed they are in a much better position to deal with it than we are. We have forgotten about the existence of the air bell and by the time two hours have passed, the unspoken possibility of John's death is clear on our faces. Thirty minutes later as we begin to consider the worst, a pale and clearly shaken John Atkinson walks into the camp. He sits beside us and relates this extraordinary tale of survival:

JA "Initially my dive was very enjoyable and relaxing. As I passed 23 m my vision seemed to flex, as though rivulets of water were running down my mask. I grabbed the shot line to stop my descent and quickly clipped off one of the extra tanks. I knew that something was very wrong and I needed to get out immediately. I couldn't get rid of the other tank, I was too dizzy. After going up only a few metres, the whole shaft began to twist and spin violently. I had the line in my hand but couldn't tell which way was up. I felt myself being flung against the side of the shaft by vertigo. Grit and sand came away from the walls and the visibility disappeared. It was as though something had taken hold and was throwing me about the cave and that same thing was pressing blackness, just behind my vision. I was terrified that I would pass out. I had managed to not loose the shot line and somehow found myself at the top of it.

I tried to swim out of the cave and realised I was going the wrong way. I came to another line junction. I could see the ripple of surface reflections and finned towards them. I surfaced in what I could immediately see was an air chamber. I wasn't out, I was trapped.



Richard Harris and Craig Howell prepare for a dive in the entrance pool

I knew that if I tried to dive again I would die. I didn't know the way out. The other guys were planning a longer dive that day. Rick would see one of his cylinders was not clipped to the line. But what would he make of that? Dave had told me about the chamber but said he'd never been there. Did he know the way and when would he notice I was overdue? I couldn't see anywhere to lie out of the water and I still felt terrible. I've waited for over thirty hours in a cave before but that was sitting in a dry passage with food to eat. In my current state, floating in seven degree water I wasn't sure how long I would survive.

In that chamber I learned what it means to look your own death in the face. It isn't a human face at all. Asking who it looks like has no purpose. It's not a human face. It's just an awful, blank, solid inevitability.

The neck of the dry suit was too tight and I pulled it away from my throat. I decided I had to stay where I was and get as comfortable as possible. I managed to get myself out of the water on a knife-edged rock. I wrote on my slate that I would wait until Dave found me. I wanted whoever found me to know that I tried to think clearly at the end. Then I wrote a goodbye note to my partner Angela. I felt very strongly that I could die. To be at the point of needing to write a farewell to her made me feel hollow and very lonely. I desperately wanted to get out and see her again.

After about forty minutes I had to take my suit off because the neck seal was cutting in too much. Getting the zip open was difficult but once out of it, I felt better straight away.

I was checking the water all the time for lights. I thought of lowering a light on my search reel to attract attention but wanted to save the batteries and I had no idea if the guys would be swimming below me or not. Sometimes I thought I saw lights but it was only a reflection from my own torch.

Richard Harris near the Resurgence

Deeper into the Pearse Resurgence

Then the rift underneath me was outlined by a bright blue glow. I grabbed my helmet, turned on the most powerful light and put it under the water, waving it about and flashing the beam with my hand. But the glow faded away and disappeared into black. Even though I was disappointed, I knew from my compass that whoever it was were probably heading out and I would be missed sooner than I first thought. Things were looking up.

After about twenty minutes another glow appeared. I flashed my light but the glow faded away. I thought about getting dressed so I could dive down if the light reappeared. I was still very off-balance and had trouble thinking clearly. If I tried to dive I didn't know if I would stay conscious or if I could come back to the chamber. Then the whole rift and pool lit up. It had to be Dave with his bloody great camera light. I signalled, wondering if he could see my own light since his was so much brighter. Then it vanished. I kept signalling but nothing happened.

Then my instinct just said "Go for it!" I got my gear on as fast as I could and dropped down the line with my vision narrowing, one hand sliding down the wall by the line to keep balance. I could see Dave's helmet lights below and then the outline of his yellow rebreather case. I couldn't tell if he saw me or not, even after I signalled with a loose torch. I was so dizzy I didn't want to leave the wall and swim to him but after a minute he came up and we surfaced in the chamber together.

The second dive had only been a couple of minutes long but I felt dreadful again. Taking the reg out of my mouth I said "Dave, I messed up. I'm in big trouble, I feel really dizzy..."

"To hell with all that, how much gas have you got?"

"One-seventy in each"

"Oh you've got shit-loads"

It wasn't the amount of gas I had that was bothering me; it was staying conscious so I could use it. But I'd been waiting there for an hour and a half at that point and I'd really had enough of that chamber!

With Dave holding my hand for balance we dropped down to 17 m and the main line. Twice going out I lost the line when it ran under rock projections. If Dave hadn't been with me, I wouldn't have made it. It had been smart not to try and find my own way out."

The next day Craig and I (with growing respect for the cave!) both have uneventful shakedown dives to the bottom of the main shaft at 105 m. The experience of following Dave down with the shaft illuminated by his SS HMI light is one I will never forget! Dave and Rick continue pushing the cave and over the next few days we are passing Dave's previous exploration to the back of the Big Room and beyond. This point has defied further exploration for the last few trips. The cave is hard on equipment and diver alike and to finally pass this point is a huge relief, especially for Dave who has battled the cave on so many occasions. It is soon clear that two leads extend from the far side of the Big Room. The lower larger one (now called the Brooklyn Exit) is dark and cavernous and drops away at a steep angle before starting to level off into the "M40". It finally ends at nearly 160 m with another abyssal shaft dropping down into the blackness!

Rick and Dave alternately push the deeper section of the cave laying 6 mm line from an improvised reel; the dives leapfrogging to 157 m, 160 m then finally Rick's astonishing, record breaking dive to 177 m. Harry and Craig happily fall into a supporting role and make their own exploration dives to 137 m.

Rick's final dive to 177 m is performed using his sidemount rebreather and has a total duration of 6½ hours. The final two hours are spent in the relative comfort of the habitat breathing oxygen at 6m, listening to Craig's MP3 player and eating chocolate. He surfaces at 9pm to a cold rainy night and his anxiously waiting buddies! He has discovered that the deepest section of the cave curves back underneath itself then again pushes onward, deeper and longer. The Pearse Resurgence is becoming a serious obstacle to exploration!

Further exploration of horizontal tunnels at depths over 160 m will require a rethink of diving techniques. The team is discussing the possibility of deeper habitats and other high-tech approaches to unravel the deep mysteries of the mighty Pearse Resurgence! Heaven forbid the cave goes deeper! Or what if it headed up from 180 m into dry passage? Talk about remote dry caving! The logistics seem insurmountable. Stay tuned!

With Thanks

NZTech07 would like to thank the following for their sponsorship or assistance: Dive Rite Australia, Otter Dry Suits, Typhoon International, DiveTek Australia, Sport Diving Magazine and Barry Andrewartha, Pelican Australia, Golem Gear, Neil Miller and DiveOz, Seaoptics Australia, TDI Australia, Submerge Scooters, Oz Patterson and the NZSS and Action Helicopters.

Analysis of John's incident

The sudden and near fatal onset of vertigo and perceptual narrowing during the descent phase of John's dive is extremely interesting from a diving medicine perspective. During an open water dive such an event would be most unpleasant. In the unforgiving environment of a complex cave system it nearly cost John his life, and it is a credit to him that he managed his fear so well and made an ultimately successful plan for survival. He was also extremely lucky that an air chamber was present above him.

Vertigo describes the sensation whereby the victim feels as if the surrounding environment takes on a spinning motion. It is completely disabling as all normal visual reference points are lost. Up and down, left and right become indistinguishable. Severe nausea and often vomiting follow.

In the context of diving, there are several well recognised causes of vertigo, some of which can be immediately discounted. Inner Ear Decompression Illness (IEDCI) is now well described in both air and mixed gas divers. However, as the problem occurred on the initial descent, that is not the cause here. Inner Ear Barotrauma (IEBT) can occur by similar mechanisms to middle ear barotraumas; that is, failure to adequately equalise the pressure changes occurring within the middle ear. John did not describe any difficulty equalising at any time, nor did he forcefully equalise during the descent.

Alternobaric vertigo is a possible explanation. In this problem, one middle ear space equalising at a different rate to the other can indirectly cause a pressure difference between the two inner ears; producing transient vertigo. A recent upper respiratory infection or viral illness could perhaps predispose to this condition. Caloric vertigo (the sudden filling of one external ear canal with cold water causing dizziness) is also a possibility in the icy waters of the Pearse.

John's history of a recent illness and the fact that he continued to feel unwell for some weeks after the event, suggests that this was a contributing factor. A viral infection of the balance mechanism of the inner ear in combination perhaps with alternobaric or caloric stimuli is the most likely cause in the author's opinion. The perceptual narrowing or feeling of impending unconsciousness is well described in the cave diving fraternity, in situations divers suddenly feel faced with their probable death.

This article has appeared in other international dive magazines

Research into Australian rainfall records based on cave deposits

Nick White

ON JANUARY 23rd 2008 Drs Henk Heijnis and Ed Hodge of ANSTO hosted a seminar to examine progress on understanding the variability in Australia's rainfall and the part that speleothem studies can play in understanding this variation of past climates to better understand the present and perhaps predict future patterns and extremes.

This was a very timely meeting with about 70 attendees from Universities, consulting firms, water authorities and both ACKMA and ASF. The attendance of cavers and cave managers was in response to the opportunity to hear of the latest studies and also because of a concern that there was an insatiable demand for more and more speleothems for analysis for climate data.

Henk Heijnis (ANSTO) and Russell Drysdale (Newcastle U.) started discussions with the background of the various patterns influencing weather and climate in Australia. Of real interest, was the El Nino-La Nina variability and other patterns, which involve longer cycles e.g. "the Pacific Decadal Oscillation" and even longer cycles again, such as climate change and human induced climate change. Various samples can be analysed to calibrate these cycles including tree rings, ice cores and deep sea coring.

Coral and speleothem growth can be used to calibrate when and how much rainfall occurred at various times. Samples must have sufficient radioactive material so that the decay can be measured, e.g. uranium-thorium series which is the most common for speleothem dating, but some shorter lived isotopes can be used for shorter periods. Thus, C14 and Th230 are useful for century studies and other isotopes are good for decade changes (Cs137, C14 and Th230). Ra226 and Pb210 are useful for years; O18 is good for studies of weeks or seasons.

Drysdale particularly put in context the importance of speleothems to understanding past climates and the advances in methodology which had allowed much better results from much smaller samples. These need expensive equipment such as laser ablation mass spectrometry but there are a series of other instruments applicable in various situations.

Janece McDonald (Newcastle U.) emphasised the importance of cave monitoring and sampling of drip waters, which can lead to a much more informed actual speleothem sampling program. The studies illustrated differences in which cations are enriched during wet and dry periods at Wombeyan.

Pauline Treble (ANU) illustrated how some of the methodological changes had allowed smaller samples to be used and stressed that seasonal changes can be measured with these newer methods. For some purposes such as tropical cyclone histories, high speleothem growth rates are needed as well as adequate natural uranium content. It is now possible to use straw stalactites for such studies; these were never used previously as they did not fulfil one of the standard requirements of such work that the part of the speleothem being measured needs to represent the original deposited material. Conventionally this required calcite deposition, which was sealed by later deposits.

A very interesting sample was a speleothem which had grown on timber which was installed during the original Moondyne Cave development; a sample with a known history. In Tourist Caves therefore, apart from a speleothem which has grown on a fence, path or installation and is used by guides to illustrate growth rates, it may be immensely valuable to scientists in calibrating and elucidating past climate history.

Ed Hodge (ANSTO) gave examples of the possibility of using the accelerator mass spectrometer for C14 to match rainfall records with speleothem records. Some of this relies on the isotopes released during atmospheric nuclear testing which started in 1954 and peaked in 1975.

JODIE RUTLEDGE

Australian researchers core drilling flowstone in Indonesia

Danielle Verdon (SKM and Newcastle U.) illustrated the importance of better informed research studies for planning new infrastructure. In particular, she referred to the IPO which is the "interdecadal pacific oscillation" which is now the subject of a lot of research investigation.

Pauline Treble (ANU) illustrated some of her work from Margaret River where she used O18 in the Moondyne sample to construct a rainfall record from 1911 to 1992. She was able to construct a 700 year record for a speleothem from Golgotha Cave. She emphasised that the WA samples were from dune calcarenites and did not have some of the same constraints as samples from Wombeyan. This longer time range allowed her to illustrate the wet and dry periods in Australia and their duration. These were referred to as the IPO of which the 20th century started as dry, which continued to the 1940s when it became wet and it reverted to a dryer period in the 1970s and is still dry. Thus, we had one and a half cycles in 100 years or a change from wet to dry and vice versa every 30-40 years. Refined studies of this periodicity will help future planning in all sorts of ways, but particularly with understanding the periodicity of droughts.

The seminar finished with a group discussion. People were agreed that cooperation and sharing resources would prove valuable. There was discussion about the need for a review article on current Australian work. Susan White and Janece McDonald agreed to set up a database about existing samples. There is already information in an AQUA dataset. Some managers expressed concern about ensuring responsible sampling. Ian Houshold (Tas), Steven Bourne and Liz Reed (Naracoorte) had sampling questionnaires to aid in the initial requests for samples.

The seminar was very successful in bringing researchers, managers, cavers and water managers together to understand the contribution which cave deposits can play in furthering knowledge of climate history.

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Sustainable mapping of caves

Philipp Häuselmann and the UISIC workgroup "Topography and mapping"

Introduction

THE title of this paper may seem somewhat strange, but anything that is of general interest today seems to have the word "sustainable" in the title. However, this is no joke: If we define "sustainable" as "minimising impact and conserving the environment", sustainable mapping does exist. The scope of the present contribution is not to advocate the use of this or that (non-toxic) marker in mapping, but to show that mapping is sustainable only if it is well done. Otherwise, after some years, inevitably the cave will have to be remapped and this adds more impact to the fragile cave environment.

Experience has shown that remapping of caves is an ever-repeating issue. There are a number of reasons to remap caves: The original maps may be lost. Or if a map exists, the original data is lost or not available. Vertical control and/or a longitudinal profile is missing. The quality of the original survey may not be up to acceptable standards.

What is even more disheartening is that if a cave needs to be remapped, many speleologists are doing so, but still not including a longitudinal profile or other important data . At some point in time the cave will need to be re-mapped yet again in order to add these important elements.

Often, remapping without including necessary data occurs because the cavers lack knowledge of what is needed and why. The aim of this paper is thus to inform the speleologist working in the field why quality mapping is needed and what elements are necessary. These elements include the "holy trilogy" of plan view, longitudinal section (and cross-sections), and a written description. We, the team of mappers all over the world, hope that this article will be published as widely as possible, to minimise future impacts of remapping projects and to maximise the amount of information that can be gained from mapping a cave, even by non-geological speleologists.

The basics of mapping

There are many different mapping styles in the world, some better than others. However, our point is not to promote a particular standard (this would be another article), but to remind cave surveyors that the fundamentals of cave mapping do not change. These include:

- Using well-maintained and functioning instruments, tapes, lasermeters etc., preferably ones that had been checked for accuracy, for instance on a calibration course.
- Use only co-surveyors who know the importance of correct data collection, are experienced at reading instruments, and of which you know possible eye defects (dioptry, parallaxis, etc.)
- Be VERY aware of the danger of deviation by metallic objects such as carbide generators, handrails in tourist caves, batteries (see *Australian Caver* 141 (1997), p. 22-24), glasses, and light sources. It has been shown that even the modern lightweight LED lamps may cause substantial magnetic fields (some only when lighted)! Please check and recheck often!
- On the danger of "changing methods", we strongly insist on mapping "from point to point". Pleeease do NOT use for a survey station the head of your colleague who happens to be standing in the middle of the passage. Choose points on the wall, on breakdown blocks or other features that can be marked and recovered later. Make recoverable stations by marking the survey points (nail polish usually does the job very well, a small red dot being discreet and long-lasting – or another method is a small (removable) clip of reflector tape). Be sure to include the location of the station with respect to the left and right walls and the ceiling and the floor (this is the standard method for recording passage dimensions). The station can also be shown in cross sections, to help locate it in the future.

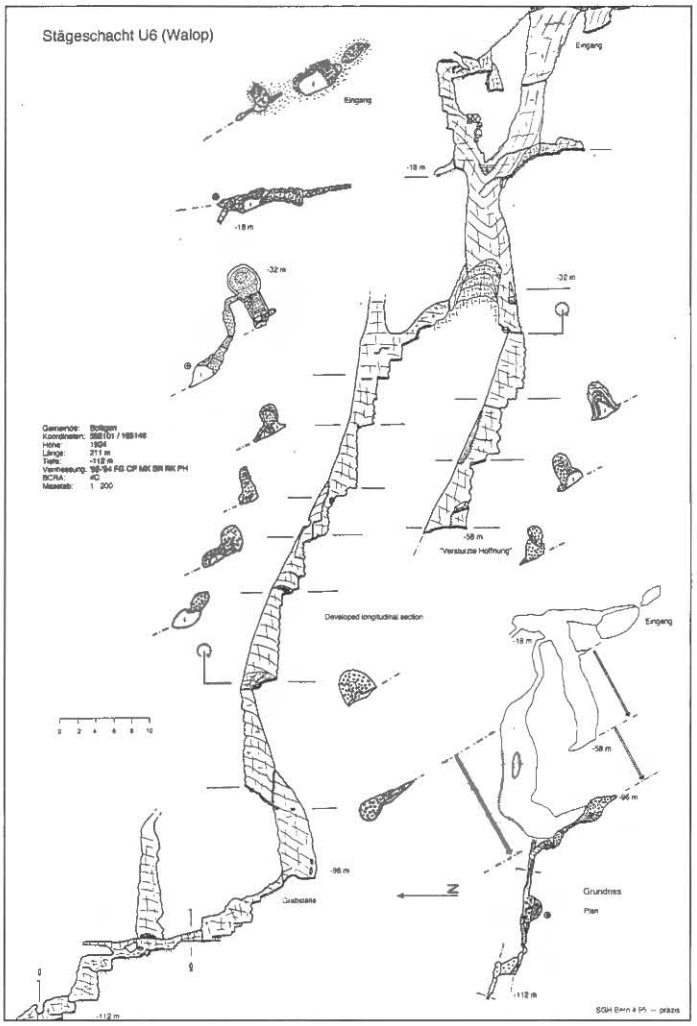


Fig. 1: Longitudinal section, horizontal cross-sections, and plan view of Stägeschacht ("Staircase shaft", Walop, Switzerland). The developed longitudinal section nicely shows that the cave mainly follows one single inclined fracture, moreover, it shows the bedding planes (and the folded structure of them in the top shaft). The longitudinal section contains two sites where it had been turned (marked by circular arrows), once for showing that the fracture going down to "Verstürzte Hoffnung" is parallel to the one in the main shafts; and once so that plan view and longitudinal section are coherent.

The plan view of the lowermost, subhorizontal part has been expanded with the superposition of the horizontal sections. This way, the interrelation of all the passages up to the surface is shown as well as the direction of the guiding fault (the hollow arrows indicate that the fault connected this way is the same (inclined) fault).

Since we are addressing methods: you may want to voluntarily round the dimension measurements to the nearest decimal (3.56 m giving 3.55 or even 3.6 m). Why? The critical measurements, which are the survey readings, are already done, so why decrease precision if it is not needed?

The location of survey stations seems to be a hot topic – some of the reviewers of this paper wanted to leave basically no mark within the cave (to preserve its natural state), while others wanted an easily visible, durable (and labelled) mark at least on bifurcations to allow future tie-ins. My personal preference is to

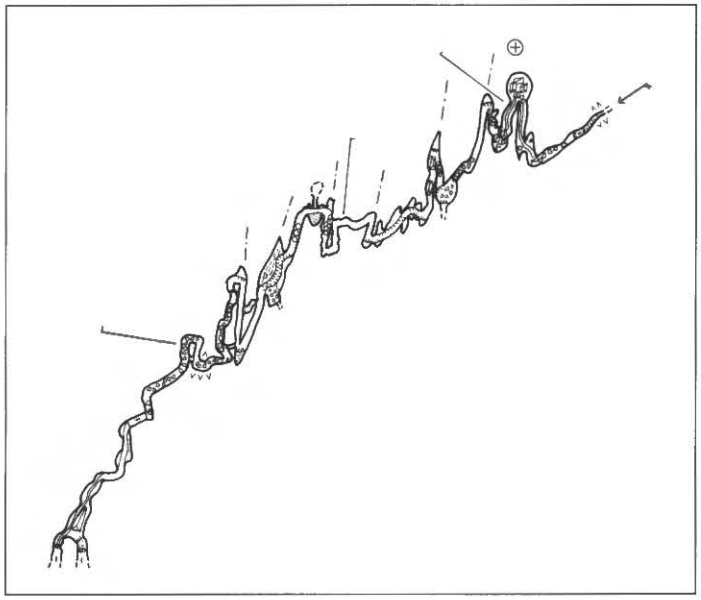


Fig. 2: Plan view of a tightly meandering passage in Anglorusskaja peshtshera (Caucasus, Russia). Here, the plan view contains some genetic information. Of course, this passage in developed longitudinal section would be much longer; the possible connection to another cave or to a surface dolina is only seen in plan view.

have points that you only see if you search for them - but they are present and labelled on critical sites.

- Last but not least, make a detailed and accurate sketch. The importance of that is described below in the section "Why precisely drawn maps?" Some people draw the sketch to scale while they are in the cave (with the aid of protractors and scale), which takes longer, but helps to eliminate possible errors and increases accuracy.

Why the holy trinity?

The first question one might ask is why is it necessary to have more than only a plan view, especially for subhorizontal caves. The answer is simple: The Earth's surface is a two-dimensional object that can easily be represented on a map - and geographical, geological, or road maps are widespread. On the contrary, a cave (even if subhorizontal) is a truly three-dimensional object and thus cannot be fully represented in a plan map: even in perfectly horizontal caves, the shape of the passage contains much valuable information that should not be neglected. Below, we present the advantages of all three necessary elements and what information they usually contain. Then, we indicate why it is much more useful to make accurate drawings instead of having just a rough "exploratory sketch" or only the mapping data. In the end, we emphasise the importance of publicising the maps and results.

Why a plan view?

- This is the first motivation of anyone making a map: a plan view shows the orientation of the cave passage, illustrates its width, relationships with other passages, and shows passage details.
- More specifically for caves, it helps to get information about possible connections between separate caves in the same area. This is why it might turn out very useful to make plan maps also for caves that are mainly vertical (and of which sometimes only a longitudinal section was made). The true extent of a cave in space may reveal that it is only a very short distance to the next (maybe more important) cave (Fig. 1). Surveys that are tied to surface benchmarks show relationship between surface features and cave features.

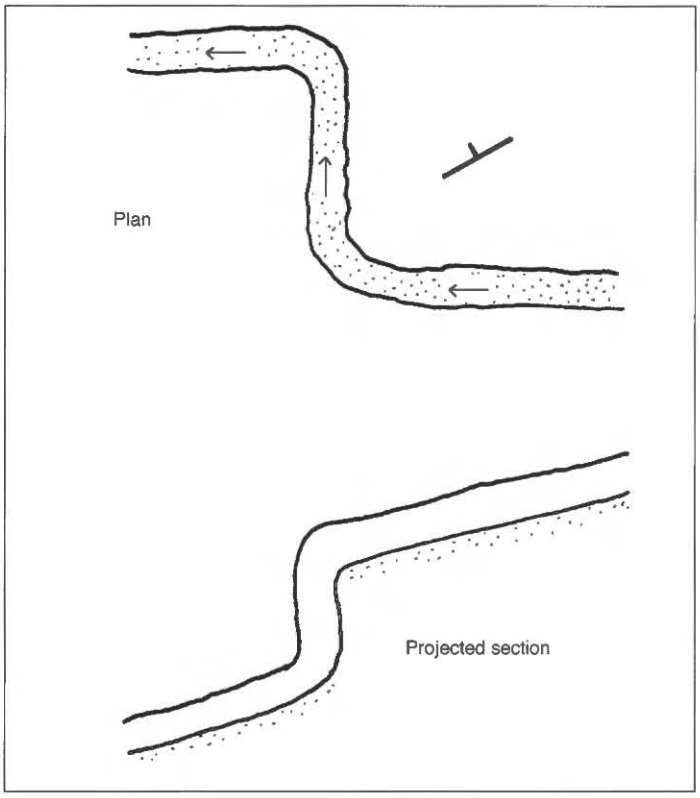


Fig. 3: Plan view (above) and projected section (below) of a hypothetical cave passage. The projection makes a shaft-like structure where in reality the passage gently dips away from the projection plane. It is evident from that figure that only developed longitudinal sections represent the true cave morphology.

- A plan view offers little information about the genesis of the cave. It however can often give information that is related: for instance, if the cave follows a set of predominant fractures, or if the cave meanders strongly (Fig. 2).
- A plan view can show the sediments encountered in the cave. Sometimes it is of great importance for finding a continuation to know the location of sediments and whether they may obstruct the main passage. Such information is usually easily seen by cavers, but if it is not reported on the map, there will be no systematic search for continuations.
- A limitation of the plan view is that it does not show the shape of the passage, nor its vertical extent (the other two dimensions) nor the relationship between different cave levels.

Why a developed longitudinal section; why cross sections?

- Alternatively, why is it not sufficient to have a projected section or elevation (see box on page 17 for the terminology used in Australia)? The answer is that a projected section hides some important information. Let us assume an E-W plane for projection, and a cave passage that falls first to the west (thus is represented "correctly" in the projection), before it turns north and continues with the same dip (Fig. 3). This portion will be shown resembling a vertical shaft. If now there are important changes in cross-section of this passage, then this cannot be seen: information is lost. A good mapper can construct a projection with the help of a plan and developed longitudinal section, but it is much more difficult (or, in case of changes in passage inclination, impossible) to extract a developed longitudinal section out of a projection. (Projections are important for having the 3D-representation of the cave together with surface features. However, such projections are to date usually done with a computer, since the mapping data

Sustainable mapping of caves

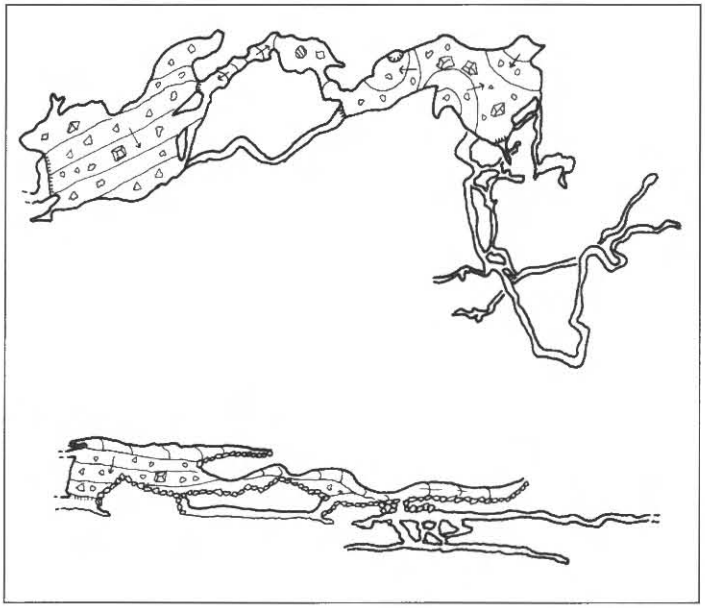


Fig. 4: Sketch in plan view (above) and developed longitudinal section (below) of the entrance part of Pestera Humpleu (Muntii Apuseni, Romania). Both of the sketches are of poor quality (so don't take them as examples). However, only in the longitudinal section, a genesis of the cave in three distinct levels can be seen. Do draw longitudinal sections also in horizontal caves!

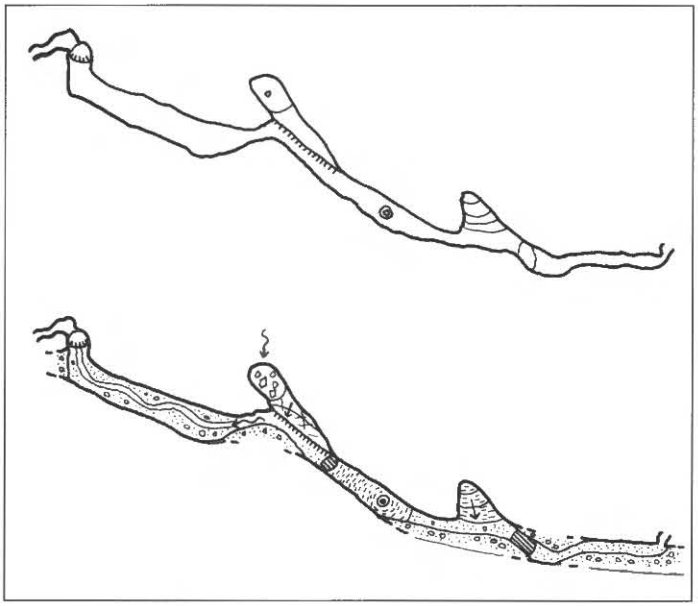


Fig. 5: The importance of drawing quality is seen in this part of a cave in Romania. The upper drawing is a (published!) sketch in plan view without major details; while the lower drawing represents the same passage with much more detail. Only the precise drawing shows a possible continuation of the large passage which may lead to the main continuation of that superb cave.

are processed with it in the first stage.)

- Longitudinal sections can give insight on fracture guidances and bedding planes which cannot be seen with a plan view alone. An example is given in Fig. 1.
- Longitudinal sections can give comprehensive views of expected difficulties (pits, crawlways, waterfalls etc.) and can thus be useful for planning a trip. They represent the total development of the passage to scale.
- The foremost and most important use of the longitudinal section is that, in conjunction with cross-sections, it gives information about the cave's genesis! All the fractures a plan view may give, all the sediment displayed, cannot give half of the information a longitudinal section does. Is the passage of phreatic genesis (i.e. a rounded tube)? Or is it a vadose meander? Or a superposition of both, a keyhole passage? Sure, much of this information is contained also in the cross-sections, but the interrelation of these forms are of importance and best presented in a longitudinal section. A good example is presented in Fig. 4.
- Cross sections are very important too: They give the shape of the actual passage, which is also very informative in terms of determining speleogenesis. In order to portray the important geologic features of the cave, all three views (map, longitudinal section, cross section) are needed.

Why a written description?

The answer is very simple: Did you ever try to draw a bat onto your plan (to scale, of course)? Or the extent of possible flooding danger you observe on the cave walls? How to represent your ideas about the cave's genesis?

The written description is an invaluable source of information that may be very important, not only scientifically, but for basic cavers: Equipment lists, flooding danger, types of rocks encountered, unstable breakdowns, gypsum occurrences, biology and genesis... all these things cannot be represented graphically and have to be written down. Thus, the description is not a marginal text describing only the things you can see on the map yourself ("To the left, a passage leads to a shaft...") but all your important observations. And YES: Everyone can observe important things! Even you can do it!

Why precisely drawn maps and not only survey data or sketches?

This is a very good question at first sight, because it is the precise drawing that takes most of the mapping time and which makes mapping so "boring". So why not only use a rough sketch? For scientific purposes, it is clear that an accurate drawing carries much more information. But also "normal cavers" can extract a lot of important information from a good drawing. Figure 5 shows an excerpt of a cave map. On the upper side, the original map. On the lower side, a possible "beautiful" map. Where is the continuation of the large passage? Yes – at the lower right corner you may try to dig to find the BIG continuation. And, of course, you do not see that on the sketch.

In short: the shape of the passage, as well as sediments and their position, coupled with information about changes in passage size, gives important information for possible continuations. But these things are only visible in a precise drawing.

Meanwhile: as you, the bored instrument reader, wait for the drawer to end his endless pencil-scratching, what do you do (besides freezing)? Yes: you look for possible lateral passages. They exist, be assured – look for them, you'll find them! Another intelligent form of keeping warm is to take back shots to confirm the accuracy of the previous reading. Be ready for some surprises!

How to decide on the scale for the map: This has to be addressed depending on the needs of the survey – a paleontological site might want a scale of 1:50 on a large sheet, while a big cave might be sufficiently mapped at 1:500 in several atlas sheets. In Central Europe, we usually map at 1:100 for very small caves, 1:200 for caves between 20 and 500 m, and 1:500 for larger caves. Try not to mix too many scales within the same cave area for the sake of comparison between the maps. Of course, if you know that your final map is to be 1:500, there is no need to take the survey to 1:50 precision - although you can do it. What you cannot do is to sketch with 1:500 precision in the cave and still draw a precise map on the

Definitions

The ASF *Cave Survey and Map Standards* document (http://www.caves.org.au/standards/mapping/stdsurv.html#10.0) defines the terms and concepts of the different types of plan, section and profiles.

Plan
A representation of the details to be mapped resulting from parallel projection on to a horizontal plane.

Elevation (or Profile)
A representation of the details to be mapped resulting from parallel projection on to a vertical plane.

Section (generally)
The trace or outline of the details to be mapped representing their intersection with a chosen section plane.

Cross (or Transverse) Section
A vertical section across a passage or chamber.

Longitudinal Section (or Longitudinal Profile)
A vertical section or elevation which substantially coincides with the general direction of the greatest dimension of that part of the cave in the near vicinity of the section plane.

Developed
A qualifying term used to indicate that a particular section comprises several contiguous, but non-parallel, section planes, which have been artificially rotated into a common plane. The technique is commonly applied to longitudinal sections.

Horizontal Section
A section where the section plane is horizontal. This technique may be usefully applied when the cave development is predominantly vertical.

Websites with more information

There are several websites that offer good information about mapping and mapping problems, techniques, and data. Some of the most useful are listed below:

http://www.sghbern.ch/hrh.html
This is the site of the HRH (Siebenhengste, Switzerland) and there are many articles about mapping, errors, etc.

http://www.carto.net/neumann/caving/cave-symbols/
Cave mapping symbols of the IUS

http://www.caves.org.au/standards/mapping/stdsurv.html
http://www.caves.org.au/standards/mapping/stab-1a.html
Cave mapping standards, terminology and symbols used by the ASF

http://www.sghbern.ch/surfaceSymbols/symbol1.html
Symbols for geomorphological mapping

http://www.ngdc.noaa.gov/seg/geomag/jsp/Declination.jsp
To calculate the declination for any site on Earth

http://www.speleo.ch/~scmn/topographie.php
Has Adobe Illustrator libraries (version 9 and 10) for electronic drawings

http://www.ssslib.ch (rubrique topo)
Has Adobe Illustrator libraries (version 10 and CS) for electronic drawings

scale 1:50 at home! So please think about this issue before beginning to map.

Why to publicise?

You found an easy, beautiful, promising cave, and you have mapped it with great effort. You may be afraid that fellow cavers, wild spelunkers, or even trekking organisations may misuse the cave - so your reaction is to keep the cave secret. This is very understandable. But, the very negative point is that once you're no longer active, or the mapper had a row with his mother who subsequently burned all maps (mind you, that is not a joke – I know such a case!) all the information is lost.

So this is to implore you: please publish your caves, your maps, your data! If publishing means a real danger to the cave, please put it (at least) into your national cave register. Several countries have registers which offer to keep the maps and data secret - use this possibility if you think it is needed. Please, do not throw away your great work by hiding it in your cupboard!

Keyword hiding material: Even if you published your great work – it might be that the original data are needed in a computer to get 3D images of the area and the surface in question. This last point might be very important in convincing a quarry manager NOT to blast where the cave is. Or, there will be new passages found (breakdown? – it needn't be that you didn't look well!) In both situations it is vital to have everything somewhere - either at your home, or in a club archive, or in a central register. Please do NOT throw away your field notes and sketches, even though dirty they might prevent another complete remapping in just the cases I described above. Keep them: The space required is small and future use might be tremendous!

A look into the future?

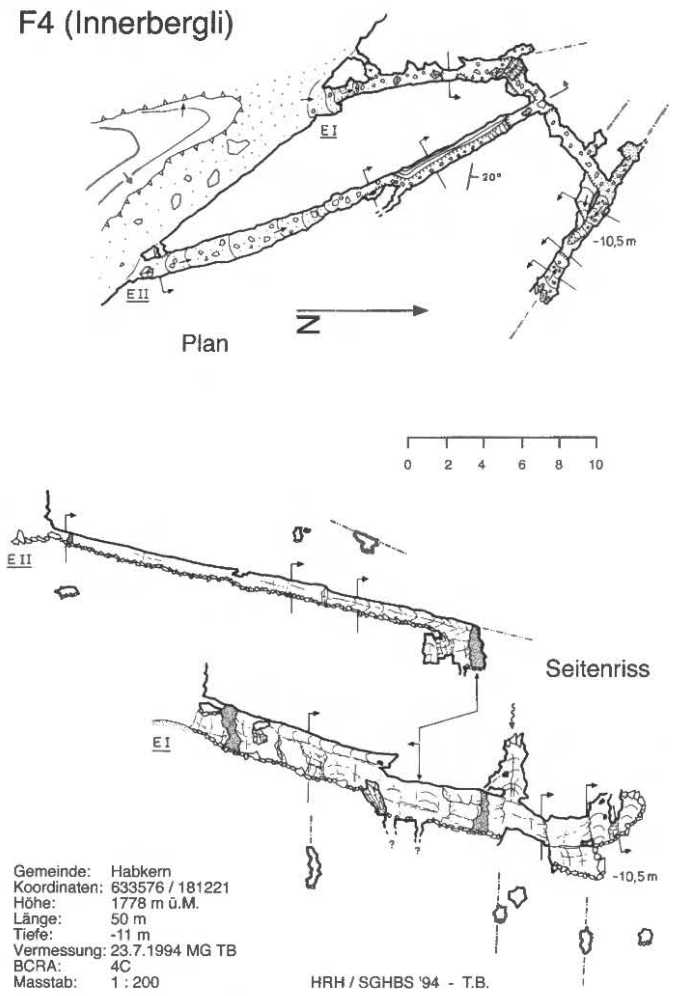
More and more, computers replace the traditional ink-pen drawings. In recent years, drawing programs (such as Adobe Illustrator) are used to generate accurate and actually very nice maps. The advance of technology will permit us to add colours to the maps (sand is brown, water is blue, or at least it should be). For persons interested in computer drawing there is a website listed below where they'll find information and prepared libraries for Adobe Illustrator. Please keep in mind: the most durable archive form is still paper – paper lasts between 20 and 500 years or even more, while CDs might be unreadable after only 2 years. So please: after having drawn by computer, print the map out for archive purposes! Save your work!

Acknowledgements

To all persons who gave input, corrections, suggestions, and who translated the article: Lukas Plan (Austria), Ralph Müller (Germany), Ken Grimes (Australia), Gabriel Redonte (Argentina), Rafael Carreno (Venezuela), Jelena Calic (Serbia), Erik Agrell (Sweden), Pat Kambesis (USA), Andy Dickert (Switzerland), Yvo Weidmann (Switzerland), Alex Hof (Switzerland), Eckart Herrmann (Austria), Arnauld Malard (France). Many of these persons belong to the UISIC working group "Survey and Mapping".

Continued

Sustainable mapping of caves



Example of a holy trinity: Cave F4

Location

North of the entrance to cave F1 in the Innerbergli, a large rock wall leads in a ESE direction. After 70 m, it gets vertical, and again 25 m and 70 m further, respectively, the two elliptic entrances are found at the base of the wall (lettered with a yellow C).

Description

The northwestern entrance leads steeply down to a narrow, fault-oriented passage which has many breakdown blocks. After 10 m, at a big boulder, the passage turns to the right (NE) and takes on a larger, rounded cross section. On the floor, some openings to shafts that are too narrow are seen. Immediately to the right (SSE), a lateral passage continues narrowly, following a bedding plane, straight up to the second entrance.

The main passage again turns to the right (SE) 10 m further, but ends after a short distance in a large breakdown. In that area, some short lateral passages as well as a small chimney with dripping water are found.

Sediments

The northwestern part is characterised by breakdown material. The southeastern entrance also shows some soil between the small blocks. At the terminus, some cave clay has been observed.

Morphology and genesis

The cave is one of the typical phreatic horizontal passages which are found as relict caves throughout the karren field. The well-rounded passages mostly follow the bedding plane. By its position, a connection with the cave F5 is possible. Otherwise, at the height of 1770 m a.s.l., there are no other passages of phreatic origin. The next higher phreatic passages are at 1790 m a.s.l.

History

Topography by R. Wenger on the 7.7.1977. Re-examination and discovery of the passage between the two entrances on the 23.7.1994 by T. Bitterli and M. Gasser.

Big Fight for a Fragile Fern

It has been reported that an endangered fern, restricted to limestone areas, has been found at Capricorn Caverns near Rockhampton. *Tectaria devexa* is listed as an endangered species under both the Queensland *Nature Conservation Act (1992)* and the Commonwealth *Environment Protection Biodiversity Conservation Act (1999)*.

Not a lot is known about the fern but it is restricted to limestone and at Capricorn Caverns grows in relative isolation from other vascular plants.

It declined in numbers of plants from 39 individuals to 21 in 10 years and now survives in six locations at the caves.

Greening Australia has been working with various partners on a project aimed at increasing knowledge of the species' habits. It is hoped to develop successful propagation so that it can be reintroduced and re-established in areas where it used to be.

A national recovery plan has helped identify some of the management actions needed for its protection.

Further information on the national recovery plan can be found at: http://www.environment.gov.au/biodiversity/threatened/publications/recovery

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Once a Barbie, always a Barbie[1]

Ocotal, Mexico 2006

Al Warild

Un poco de historia (... or you can read the unabridged versions in *CA* 162 & 169):

In 2004 "Team Pirata[2]" found ourselves on a USDCT[3] trip to prospect some new areas near Cueva Cheve in the NE corner of Oaxaca State, Mexico. At 1494 m deep, Cheve is the deepest cave in the Americas and reportedly one of the world's great caves. So a cave near it could also be a great cave. In the same area is Charco, perhaps the world's most horrible 1000+m deep cave...

Only when we arrived did we realise that it was a desperate attempt to find a 'back door' to Cueva Cheve and the world's deepest cave. American cavers have been dreaming of finding one ever since 1989 when Cheve hit a serious rockpile and hasn't done much since. Even during the exploration of Charco the dream continued, but considering the difficulty and gross unpleasantness of Charco they were fortunate that the dream was never realised.

When we got there, the 'team' was digging boulders in a dry creek bed. Like I said, desperate! *"If you guys go down there and dig, we'll support you..."* "Gee, thanks. I think we'll try the next objective." You've got to give it to them for enthusiasm and persistence, even if it is usually someone else down there doing the digging.

We rigged Sumidero Aguacate, wrote the bottom off as a truly unpleasant place, and disappeared into the hills, leaving the USDCT to camp in there for 2 weeks at -175 m bolting up the walls and digging mud. To be fair, they did find around a kilometre of slimy new passage that nobody wants to go back to. We prospected the high rainforest covered karst and among not many others, found 'Barbie Cave'. Hardly a great name for a cave.

Hardly a great cave either, but in the context of: *"...J2 is a really appropriate name because it's like K2 in so many respects: not quite the highest/deepest (yet), but should be, much harder than the highest/deepest, an American explored cave..."*

Can't argue with that, even if it is way off on all three counts. I'll call it 'Ozto Ocotal'.

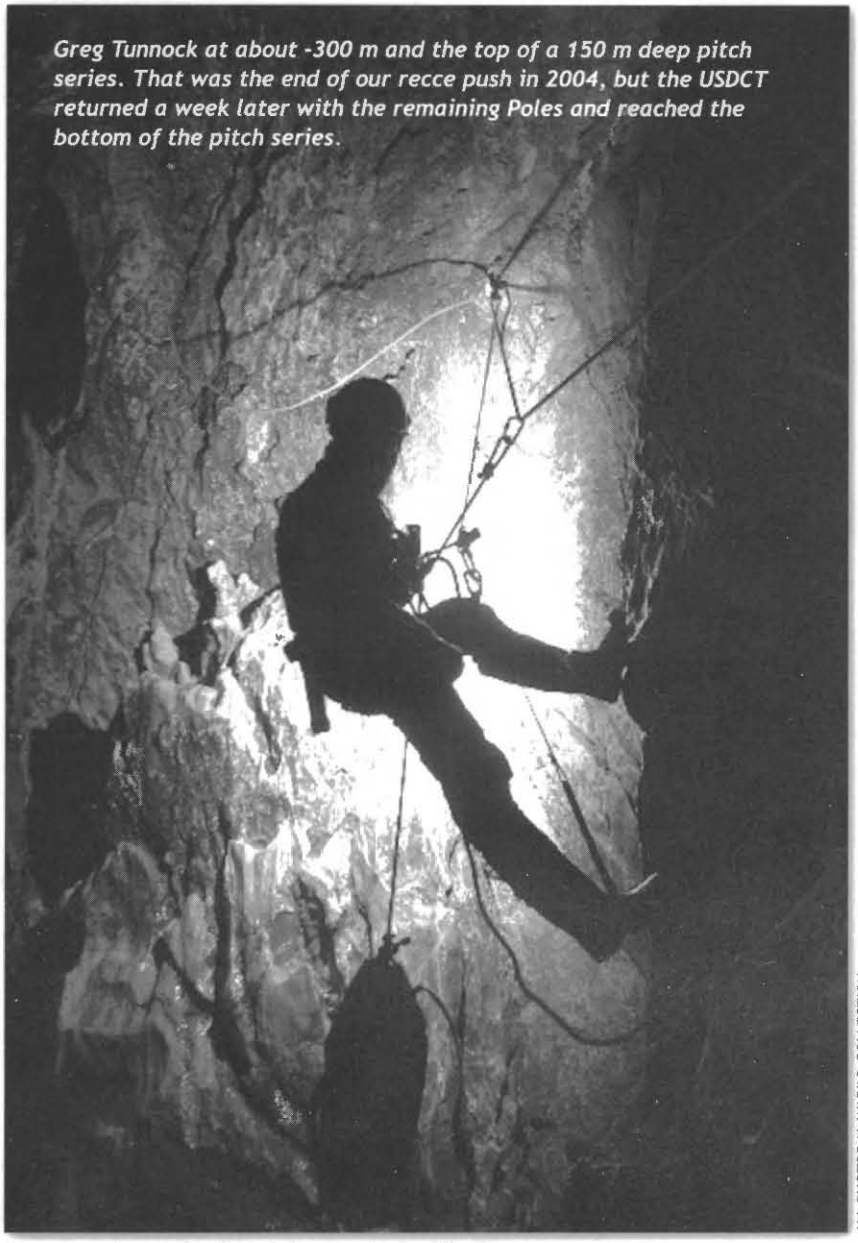
That first year we reached ~-400 m. The USDCT was largely stopped by the Barbie squeeze that they promptly blew to bits (for safety reasons of course!), but left their power cable in place. Never know when you might need a power cable running down a cave.

....2005

An entrance at 2250 m. The cave going, and looking better. Clearly, we **had** to return in 2005.

Just one small problem:

A group of British cavers trapped by floodwaters in an area to our north and the ensuing media circus. This meant that high profile expeditions like ours couldn't just quietly go caving like other groups.



Greg Tunnock at about -300 m and the top of a 150 m deep pitch series. That was the end of our recce push in 2004, but the USDCT returned a week later with the remaining Poles and reached the bottom of the pitch series.

ALL PHOTOS AL WARILD COLLECTION

In 2005 we got through a sump at -750 m and the final push team got to -1100 m before they stopped with flat drill batteries.[4]

Last year (*CA* 169), I finished with: "It'll be at least 1800 m before it connects, if it makes it that far and doesn't die in a rockpile or impossible sump. We'll be back in 2006 to find out"

2006

Time to find out.

This year things will be different. This time we'll do things properly. Just a few not so subtle changes like common expedition food, bolts that you can place by hand or power drill, a fair chance for all at the lead, some planning. After 6 months of haggling,

1. Barbie: a crude but clear reference to how tight the cave is.
2. Team pirata: a loose agglomeration of Australian, Spanish and Polish cavers + a few others
3. USDCT: US Deep Caving Team. Not really a team, more a very successful marketing device to get sponsorship.
4. The USDCT is sooo high tech that it is unable to place bolts without a power drill.

Once a Barbie, always a Barbie

So that's what a 3 tonne truck of food looks like ...

Our food supply for the expedition. We made no real distinction between the type of food that we ate above or under ground.

We divided the food into four equal units and put 'don't open before' labels on them to avoid eating all the goodies at once and being left with nothing but porridge for the final week.

things were shaping up well. The USDCT had even conceded on the food issue provided they could have nothing to do with it beyond telling me what they wanted. During the year there had been talk of a hydro-electric generator to charge batteries in the cave. I thought that sense had prevailed and the idea abandoned. No such luck.

Two months before the trip, word trickled out that we would have a 'mini' hydro-electric generator. 'Small' and 'lightweight' may have been appropriate had we been comparing it with the Snowy Hydro-electric Scheme. It weighed only 7 kg and would recharge drill batteries forever... and filled a plastic drum that had a larger diameter than parts of the top 300 m of the cave, and three very big (70-80 L!) packs of pipes and hoses and ballast batteries, and 10 m water head required to run it... Pity the cave had become horizontal. Neither a hydro-head within kilometres of the lead, or a need to drill many holes once we got there.

"But you don't understand [Al]. The mini-hydro thing was supposed to be a test run for drying clothes in Camp 9." (Name withheld to protect the privacy of the source)

Set up

Oaxaca City

The first time I've rolled up at the cash register and paid a US$2000 grocery bill, and that was only the first half. On our last shopping day, Soriano was snoozing in his truck waiting for us to return from the market when he felt a bump. He looked out to see a guy trying to remove the front wheel just outside his window. "Sorry" says the guy as he hastily leaves "I didn't think there was anybody in the truck."

Ocotal

It took us a 3 tonne truck and some 40 burro loads to get most of what we needed up the hill, then a couple more days to get base camp in place before we could get on our way.

Yes, this year we had organisation and plenty of goodwill to get things done. We had 11 km of

Caving is always interesting with a nation of people who think big. Greg modelling a 'cave' pack that was 'marketed' as being "only a tad larger" than the 35 L packs we had been using. It was a little bigger than your average 70 L pack.

phone wire to set up Michie Phones (robust, single wire telephones that run for weeks on a single 9V transistor battery), between base camp and the underground camps. We had 'standard' underground food packs. We had two camp tents for 6 cavers each. We had hand-driveable Spits to place bolts without a half a pack of electric drill. We had a plan of attack (that didn't include a hydro-electric plant).

Each trip in laid phone line or carried in supplies. In 10 days we had 3 camps set up. Camp 1 at -500 m was only a staging station for gear carries and cup of tea stop. We moved Camp 2 from beside a noisy waterfall through sump 1 to a nice sandy beach at -900 m and called it 'Mazunte Beach', errr, Camp 2a. Camp 1000 (Camp 3 [well, altimeters give some interesting readings unless you temperature correct them]), was in a fossil stream canyon just beyond the 2005 limit of exploration at -1100 m. Not surprisingly, it took a bit more work but we found a tolerable spot if you didn't mind a boulder in the bedroom.

The rockpile between C2a and C3 that had caused so much concern last year when they had to move boulders to get Pawel out gave in easily when the second team in found a low-level, stable but tight route through. The choice was simple: uncomfortable, but dangerous or really, truly uncomfortable, but safe. Once a Barbie, always a Barbie...

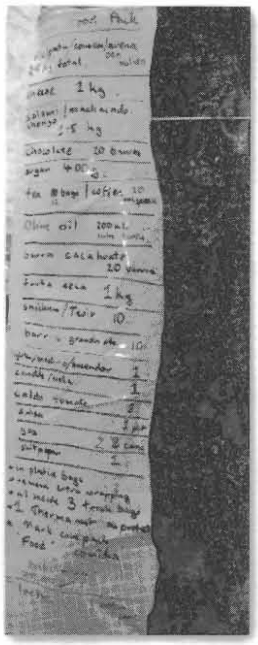
Each trip out dragged out a bit more of the junk left behind in 2005. Even so, it took us until the second last trip to get it all out. Extra points to Pawel and Pinto for pulling out the pink dive tanks (2005: *"they're old and not worth anything"*. 2006: *"they were strategically located"*) and Jon for the rockpick...

As usual, the Barbie really called the shots. She wasn't going to give up her secrets easily or lie down and die without thrashing us first. Despite having a fresh team heading down every three days we kept hitting stoppers. First another rockpile that swallowed the efforts of two push trips. This led to more big passage, then an 'interesting' echinolith streamway that you had to climb along with great

Once a Barbie, always a Barbie

The section between camp I at -540 m and camp 2a at -890 m was great caving – like canyoning underground with a near sump and lots of traversing to stay out of waterfalls. Rigging where you had a choice between oversized bolts (if your drill had batteries), or cut as you go rope slings, didn't always look so neat!

"... then an 'interesting' echinolith streamway that you had to climb along with great care as everything sounded and felt breakable, and some of it was." – at ~-1150 m.



Contents of a standard food pack for an underground camp: 35 L, 13 kg pack to last 10 caver days at 16,000 kJ per day. It was too much, better to budget on 12,000 kJ/day.

care as everything sounded and felt breakable, and some of it was. You could always hear the stream below, but never reach it.

Then it all went quiet.

Then the walls became coated with mud.

Then a sump.

Not a small pool with a cascade entering it and wind everywhere like in 2005, but a big, still, deep, blue lake. The cave had in fact been almost horizontal since we descended the pitch that stopped last year's exploration. The only substantial 'down' was after we climbed up to pass the previous rockpile.

Sifón de los Piratas

We all lost count of the number of caver-hours we collectively spent banging our heads against dead-end 'sump-bypasses'. Mark spent 2 hours lost in a boulder maze only 100 m long. Greg and I all but got lost just following the survey tags back out. We felt or imagined breezes in the most amazing places. In the end, everything either stopped or wound its way back to just above the sump.

Eventually we had to make the call no one wanted to make. "Looks like a dive." The ramifications were far from trivial. Heavy and bulky dive gear (no small steel tanks here), along the ~6 km of passage and down -1200 m, much of it unpleasant with almost no just plain walking. It is either tight or boulder jumble to walk over or wiggle through. Last years effort of 11 packs to put a diver in sump 1 was still fresh in our minds. James (Jaime) Brown was our specialist diver. He's no vertical caver, but we could help him and his gear down the cave if he could fit it into five reasonable packs. He did. He dived 150 m to a rockfall room, de-kitted and found his way through a short rockpile to another sump. His 'orders' were *"If it's over 100 m long we won't be pushing it this year..."*

Meanwhile, on the surface and before the news came back, Bill was making plans for a follow-up dive. Most other people were making plans to leave for home. Clearly, we had enough people to get the gear down there. Just as clearly (to most of us anyway), we wouldn't have near enough people to get it out in a week's time even with someone who claimed to be able to carry out four tanks himself.

Way below us, Team Pirata was on the ball and let the remaining air out of Jaime's tanks even before he was dry. Sure, it would have been better to save the air for a second push, and that's probably what would have happened on another expedition, but considering many people's fears as to what that second push could entail, they made a self-preservation decision that left the lead still hanging – nothing worse than a half-dead Barbie.

With the tanks out, all that remained was the derig, but wait. Why derig... when you can 'strategically place' (some cynics would say abandon), as much as possible in the cave in case it's needed in the future? There's a string of USDCT 'strategic dumps' in deep caves across Mexico.

One final team moved in to bolt up the walls and find the way on, and do the all important job of trying to eat all the excess food we'd carried in.

The rest of us had to leave some gear as there was one last party below us, but we did remove just about everything that wasn't nailed down.

"...so if the cave does get large beyond where you stopped it would be senseless to go through all that tight fissure crap every day when you could be efficiently exploring from a camp. That is what support personnel are for: to supply the lead team so they can work from a camp."

...and he got his wish, in a Barbie sort of way.

Postscript

Will there ever be another trip Ozto Ocotal?

There is talk in USDCT circles of a 3 month diving trip using the latest 'briefcase sized' rebreathers to push the sump in 2008. (Postponed to 2009). Just after we left there was political strife in the Oaxaca state capital with the city centre barricaded for nearly six months until the army moved in. Not pretty. Somehow getting permission to go caving becomes trivial when people are being shot in the streets. When things return to normality, we'll see.

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Fremantle, Western Australia — 21-26 September 2008

INTERESTED in cave fauna? Have you observed cave habitats in the caves you visit, and are keen to find out more? Maybe you have participated in research on subterranean fauna and want to hear some more research on a particular topic. Do you work in the biological field? Then plan to head to WA in September 2008.

These biennial Symposia are held under the auspices of the International Society for Subterranean Biology, the principal global forum for connecting researchers working on both the terrestrial and aquatic components of subterranean biology.

Australia's subterranean fauna is amongst the most diverse globally, a far cry from little more than a decade ago when it was considered impoverished. In Australia, subterranean biodiversity is particularly high in the rangelands and the arid zone, a distribution that coincides with major resource projects for which subterranean fauna has become a significant environmental issue. As subterranean fauna issues affect many resource areas it has spawned novel issues for environmental managers, consultants and regulators. Australia-wide environmental agreements recognise both, that subterranean fauna form a significant component of Australia's biodiversity, and that they are in need of specific protection.

The Western Australian Museum is the host institution for the conference. An organising committee have been meeting for the past year and the Symposium is being developed in collaboration with a national and global network of scientists. Attendees will involve people from a broad range of backgrounds, from government agencies (land management and museums), universities, speleologists and environmental consultancies throughout the nation.

The International Society of Subterranean Biology was founded in 1979 in France as the Société de Biospéologie, to focus research on the subterranean biology of karst, caves and groundwater. Through 1980 to 2000 the society rapidly progressed to become a European and then the International Biospeleological Society. In 2004, to better represent all subterranean habitats, especially alluvial aquifers, the name was changed to the International Society of Subterranean Biology.

Delegates typically are the leading researchers in the field of subterranean biology and representatives are expected from more than 30 countries, predominantly from Europe, but with strong representation from the Americas and Indo-Pacific. Papers from the symposia are typically published in the Society's peer reviewed international journal *Subterranean Biology,* and in other learned journals.

Subterranean faunas comprise species that are typically restricted to small areas and commonly represent ancient relictual populations or comprise groups of animals not present in other habitats. It has been recognised, belatedly, that subterranean faunas represent a significant component of biodiversity globally.

Their functional role in maintaining void space in aquifers and their influence on water quality is being actively investigated.

While subterranean faunas reach their greatest diversity in karst, typically limestone areas, to a depth of one kilometre, they occur widely in other habitats such as alluvial aquifers, pisolites and groundwater calcretes, and may be expected wherever interconnected voids occur in the regolith.

In the last decade subterranean faunas have been singled out for special protection and consideration both internationally (Council of Europe, European Commission, World Bank, Ramsar Convention, ANZECC and ARMCANZ, Switzerland) and in Australia (Council of Australian Governments Water Reform Agenda, ANZECC and ARMCANZ).

Subterranean fauna are increasingly appearing in lists of threatened species under both Commonwealth and State legislation and as such more frequently appear in environmental review and management documents.

For more information on this event, contact ASF representative Jay Anderson on rossjay@iinet.net.au or visit the website at http://www.issb2008.org.au

E-SPELEO BULLETIN

A publication of the Australian Speleological Federation

SHARING CAVING NEWS AND EVENTS

■ In a hurry and need a quick update on topical ASF issues?

■ Got a club event or milestone you wish to share?

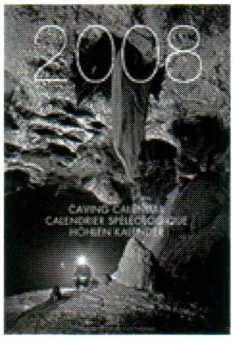
■ Want others to know about your interests in national and international events or conferences?

■ Know where to get a good deal on equipment?

Then get online and tell us!

E-Speleo is circulated monthly by email only, so make sure your details are up to date with ASF via your club.

ASF E-Speleo Bulletin Editor: Ross Anderson espeleo@caves.org.au
Article cut-off 25th of each month

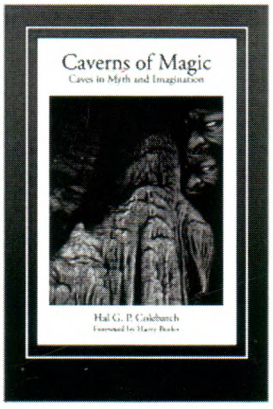


Still some Speleo Calendars left!

A LIMITED number of these spectacular calendars are still available, without having to deal with international money transfers! Make a tax-deductible tax donation of $35 or more to The NSW Cave Rescue Squad and receive a gift calendar for your enjoyment! 12 stunning images take you on an enchanting subterranean journey to caves around the world.

This year's destinations include the wild caves of Australia, Austria, China, France, Iran, Malaysia, Slovenia, Switzerland, United States and Venezuela. This year's calendar also has 24 free postcards and a special feature on cave photographic teams. Make your donation soon and don't miss out on this great gift! Send your cheque to: C\- Grace Matts, NSW Cave Rescue Squad Inc., 176 William St, Bankstown, NSW, 2200.

Preview the calendar at: http://www.speleoprojects.com/html/detail/speleoprojects/kalender_06_en.html



Caverns of Magic: Caves in Myth and Imagination

by Hal G. P. Colebatch
Published by Cybereditions
ISBN:1-877275-01-8

Extracts from Jacket:

"The modern-day speleologist is a romantic, seeking out darkness, discomfort and some danger to find a strange beauty and wonderment. Generally without applause, acclaim or publicity, they seek to touch certain wellsprings of myth, beauty and mystery. Speleology tends to bridge the gap between the so-called two cultures of science and art. To be a speleologist, one needs to be at least a slightly special type of person."

"Hal G. P. Colebatch is a well-known Australian poet and writer. In 2003 he received an Australian Centenary Medal for services to writing, poetry, law and political commentary. While working as a reporter for *The West Australian* newspaper he was involved in the discovery of several kilometres of extensions to Easter Cave in the south-west of Western Australia."

Review coming in *Caves Australia* 175.

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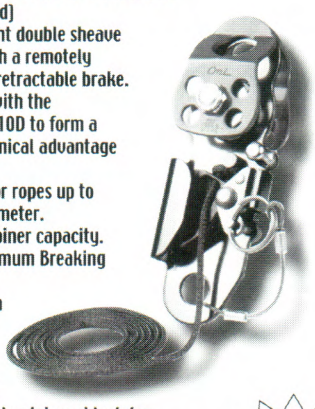

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The 14 LED model has three switchable lighting levels and a long duration survival light function. Uses 4AA batteries in a battery pack carried on the head.

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SPELIOS

The Spelios combines an Elios helmet with a fixed Duo 14 LED light. Two sizes: 48-56cm & 53-61cm.

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e+LITE Headlamp is a tiny headlamp with illumination from 3 x White LEDs or 1 x Red LED. Waterproof to -1m, range 19m, Duration: 45 hours, Weight: 27g. Supplied with 2 x CR2032 Lithium Batteries and a protective pouch. Small enough to carry as an emergency light at all times.

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Photo: Reseau de Bufo Fret, in the French Pyrenees. © Christophe Levillain