

AUSTRALIAN CAVER

A black and white photograph of a caver. The person is wearing a white helmet with a headlamp and a dark jacket. They are working on a wooden structure, possibly a piece of equipment or a part of the cave's interior. The background is dark, suggesting a cave environment.

No 149

Diving in NingBing
Vietnam '99
Caving on the Nullarbor



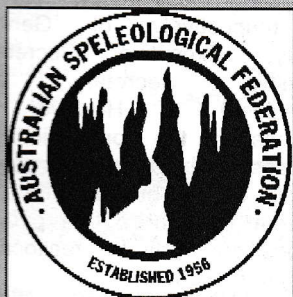
Nullabor: Entrance of Murrawijinie Cave No. 1 (N-7), looking to the south-east. Photo: P J Ackroyd (see article this issue)

COMING EVENTS

29th-30th January 2000, **ASF Council Meeting**, Canberra (accommodation available).
Contact: Chris Bradley, chris.bradley@abs.gov.au, (02) 62470108 (h), (02) 62527232 (w)

28th December 2000 to 2nd January 2001. **23rd A.S.F. Bi-ennial Conference** in Bathurst
(see Notices section for further details). Contact: the Conference Convenor, Angus Macoun
on (02) 9416-2588 or at [<amacoun@eagles.com.au>](mailto:amacoun@eagles.com.au).

2001 July International Congress of Speleology, Brasilia, Brazil



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All contributions are welcome.

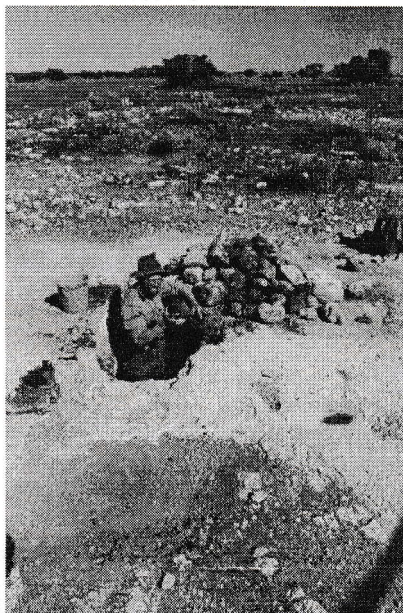
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The views expressed in the Australian Caver are not necessarily those of the editor or of the ASF

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Front Cover: June MacLucas drawing in Thampanna Cave (N-206), Nullarbor Plain. Photo by Peter Ackroyd

Back Cover: Bat skeleton beyond the sump in NG-1, Buchan, Victoria. Photo by Peter Ackroyd

Editorial

Welcome to issue 149 of Australian Caver. I hope you all enjoy the variety of articles within

As those of you that read the OZCAVERS mailing list may already know, this is to be my penultimate issue as editor. I will be resigning after issue 150 due to the impending arrival of my second child.

If there is anybody out there who is interested in taking over the reins see the Ad opposite.

NEWS & NOTICES

ASF Bookshop

ASF has accepted a proposal from Bob Dunn in Canberra to offer a retail facility for books published by or for ASF and its members, along with other cave-related publications for which there is a market. The net profits of this venture will be paid to ASF.

The first major publication will be the long-awaited volume dedicated to the late Joe Jennings, sometime President of ASF and Professor at the Australian National University. This will be published for ASF by the University of NSW Press, with a release date expected early in 2000. A further announcement will be made in a few months.

Vacancies on ASF Executive

The period of office of four members of the ASF Executive expires at the next Council Meeting. The four retiring Executive Officers are Peter Dykes, Heather Jefferies, Angus

Macoun and Jill Rowling.

At present these people hold the office respectively of General Secretary, Executive Secretary, Membership Secretary and Vice-President. However in accordance with the Constitution it is not the position held by these people which falls vacant, but the tenure on the Executive of those four people. The positions may be reallocated following the election.

I call for nominations or expressions of interest. Candidates may be nominated by Corporate or Individual Members or they may express their interest in writing to the Returning Officer.

Nominations or expressions of interest must be received by me not later than 29 December 1999. The election will be conducted in accordance with the By-law on Election of Executive Officers.

Ken Grimes, Returning Officer

PO Box 362, Hamilton, Vic 3300 or
e-mail: ken_grimes@h140.aone.net.au

ACKMA/ASF Joint Meeting

John Dunkley

ASF and ACKMA - Joint meeting in Queanbeyan

At the last ASF Council Meeting in Rockhampton there was discussion about relationships with ACKMA (the Australian Cave & Karst Management Association Inc) in the light of a letter received from them last year. Arthur Clarke was able to raise some of the issues with ACKMA at their conference at Mt Gambier early in 1999. The ASF Executive then met jointly with some of the ACKMA Executive in Queanbeyan on October 8. We are grateful to Andy Spate of NPWS-NSW for organising this, especially as it was apparently in his own time. In general it was agreed that regular communication was important, and among the issues discussed were:

ASF expressed concern that recreational speleologists were being overlooked in management decision-making and in consultancies relating to cave areas. A joint register of consultants will be drawn up by both organisations of members with special skills relating to caves and karst, and where appropriate a list will be

forwarded from which the principal seeking consultant services can choose suitable individuals. Notes about each organisation's activities will be placed in the newsletter of the other, and the respective Presidents will receive newsletters. ASF & ACKMA will investigate the possibility of spreading their conferences further apart (at present they are only a few months apart), possibly into alternate years, and ideas for improving the attractiveness of conferences were exchanged. The possibility of a joint fee structure was revisited and will be further investigated by Ernst Holland & John Dunkley. Ernst Holland also offered to investigate the future organisation of the informal Karst Studies seminars.

ASF conveyed the view of several clubs that some management agencies do not understand or recognise the contribution of speleologists to documentation, conservation and overall resource management of caves and karst, especially non-tourist caves about which they are frequently the sole repository of knowledge. A major

issue is demands by managers for data and other information (such as maps) about caves and karst, owned or held by ASF, member clubs and individual speleologists. Some clubs and individuals have complained about inappropriate demands being placed on their intellectual property.

Practices around Australia vary widely, from situations where there is a long tradition of shared information to ones where there is an air of mutual possessiveness. ASF put the view that there are some caves and whole karst areas which would not be there to manage but for the voluntary efforts of speleologists, and that some agreed protocols or other mutual understandings are needed. ASF feels that conservation and management of caves should be seen as a partnership rather than an atmosphere of them-v-us. ASF has agreed to initiate a discussion paper on this topic and to involve management and academic personnel. These and other issues will be pursued at a future meeting.

(As an aside, the ability of clubs to obtain access to various cave areas

depends strongly on maintaining mutual respect and good relations with managers, and Keir Vaughan-Taylor among others has stressed the importance of promoting this on the local level. Sometimes, due to

personnel turnover this does not work well. By exchange of views at a national level we hope that both speleologists and managers will come to respect the different perceptions.)

The ASF Executive agreed that

this meeting was positive and went a long way towards alleviating some of the concerns expressed by both cavers and managers.

ASF Executive Meeting

The ASF Executive met in Canberra in October and were kind enough to invite me as the editor of *Australian Caver* to come along and find out what it was all about. The meeting covered a very wide range of issues of interest to ASF members, some of the highlights of which are outlined here:

- The Publication Commission reported that a book in tribute to Joe Jennings is to be published by the UNSW press.

- A grant has been applied for to compile a history of Australian Caving.

- The Speleological Research Group which is responsible for publishing *Helictite* has approached the ASF about the possibility of the ASF taking over the publication. The executive is recommending that *Helictite* be brought under the wing of the ASF but that the editors should retain autonomy in the day to day running of the journal.

- The Cave Leadership Accreditation Group (CLAG), based in Tasmania has wound up due to lack of

interest. On behalf of CLAG Jeff Butt has forwarded CLAGs assets including a cave Safety Manual, Cave Safe videos and \$1200 to the ASF. These will be passed on to the Safety Commission.

- The ASF Bibliography Commission maintains a bibliography of caving publications and articles within Australia which it forwards to the International Union of Speleology (UIS). It has been recommended that this data should also be forwarded to the ASF.

- The executive will be recommending that the ASF form a Cave Rescue Commission to be headed up by Grace Matts. This body would be intended to encourage cooperation and exchange of information between the various state and regional rescue organisations. It is not intended that the Commission involve itself with actual rescues.

- The executive is to recommend that the ASF Documentation Commission, which is responsible for the Karst Index, be wound up. The

Commission has completed its task of providing the ASF with the Karst Index data in database form. This data will be passed onto a working party, consisting of the state coordinators of the Karst Index which will be responsible for implementation and further development of the database.

- The ASF Library has moved to John Dunkley's new address in Canberra. Following various donations of journals the library has a number of duplicate journals which are available for swaps.

- Mike Lake is to be appointed as the ASF interim representative to the Jenloan Science Trust Committee. He is to replace Patrick Larkin who no longer has time to serve on the committee.

- It was noted that clubs have been failing to comply with the correct procedures for proxy votes at ASF AGMs. Written copies of proxies should be sent in writing to the ASF secretary prior to meetings.

Sherry Mayo

Wanted: Editor for Australian Caver

To take over editing the ASF's quarterly journal from issue 151 onwards (issue 151 is due out in May 2000).

The editor will need a reasonably powerful PC and will be supplied with up-to-date page layout software. The editor's task is to layout each issue of *Australian Caver* and to output it in a suitable electronic format for sending to a printer. Printing and distribution are handled from that point by Angus Macoun.

The editor's job is a busy but rewarding one. It makes a valuable contribution to the activities of the ASF without being too involved in the politics! If you think you might be interested but want to find out more first, you can contact the current editor, Sherry Mayo on (03) 9533 0437 or mayo@mst.csiro.au.

Wanted: Advertising Coordinator for Australian Caver

It involves:

- * Seeking out advertisers;
- * Liaising with the Editor and advertisers to ensure correct advertising copy and position in the Journal;
- * Liaising with the Publisher and advertisers to ensure correct billing.

This position will inject funds which will allow for:

- * Better quality Journal with better paper, print quality, size and colour;
- * Less funds required from the Federation's budget which will keep our fees low.

If you wish to make a positive contribution without much time outlay, this is the job for you!

Expression of interest in either position should be forwarded to:

Angus Macoun (02) 9416-2588 / 0414 776-456 / email: artoflight@eisafree5.com.au

1997 Edie Smith Award - Neil Anderson

Peter Berrill - ASF President

At Last!

It was one of those wonderful occasions where outstanding issues could at last be put to rights. Although ASF had decided to bestow its most meritorious award on Neil Anderson back at the Quorn Conference in May 1997, no ceremony had been held, nor had any public recognition been given to Neil. That is until 7 October 1999. The ASF Executive was meeting in Canberra, and the occasion was seized to get things back on track.

In presenting the award at the monthly meeting of Canberra Speleological Society, ASF President Peter Berrill first apologised for the long delay, stating that the thread of action had been lost as a result of turnover in the Executive, and he was honoured to be landed with the job, late though it may be.

The award took the form of a beautifully enlarged photo by John Brush, also of CSS, of a delicately back-lit snow white soda straw formation in Eagles Nest Cave, Yarrangobilly.

Neil said he was "quite astonished" at being selected, and for all these years "was just doing what he loved to do". The framed photo would occupy pride of place in the family home.

The text of Peter's presentation to Neil follows--

Australian Speleological Society, Inc.

1997 Edie Smith Award - Neil Anderson

Neil started caving in the early 1960s but really took off after he and Carol moved to Canberra and to that famous house in Aranda which they have occupied ever since.

He was involved in exploration of caves in many local areas such as Wee Jasper, especially Dogleg Cave and the shafts that sit above it. He was a regular visitor to Cooleman Plain, Yarrangobilly, Wyanbene, Bungonia as well as in Tasmania and later in Thailand, New Zealand and the Northern Territory.

It was Neil's climbing ability that led the Tasmanians to an upper level in Kubla Khan and beyond. This followed an earlier climb towards the inner end of Wyanbene Cave, up what has become known as Anderson's Wall, that led to Frustration Lake, which to



Neil Anderson (left) receiving the Edie Smith Award from ASF president Peter Berrill

this day remains the innermost point of the cave.

In 1988 Neil joined the growing band of veterans of the Thailand expeditions, and he led the 1990 and 1992 trips. He was instrumental in discoveries in several discoveries including Long Snake and the inner bits of Susa. Neil was also leader of the Australian contingent of the joint CSS/Thai Royal Forest Department expedition to the Khlong Ngu in western Thailand in 1996. The trip discovered and explored Tham Nam Tok, a 2.4 km stream cave with waterfalls up to 20m high - all explored from the bottom end. Neil was the driving force behind this. The expedition also saw lots of shafts explored and caves documented, despite bad air.

1991 produced some speleological serendipity. CSS was offered a rare opportunity - a previously unrecorded karst in the Northern Territory, rumoured to have caves. Neil led the first CSS contingent so his salesmanship skills could establish sound relations with local managers, and it is a measure of the positive relations established that these trips have Australia's most productive saga of cave exploration and surveying. Nearly seven kilometres of cave was surveyed on that first trip which, like the Thailand expeditions, fired the enthusiasm of all who went as well as those who were inspired to join later trips.

Neil is past President of CSS Inc, a position he was elected to several times over the years. He also has held a range of positions on the CSS

committee. Arguably his most notable contribution was as equipment officer, a position he held for the best part of 30 years. Perhaps reflecting his (Scottish) background, the equipment was lovingly maintained and items were only disposed of when truly worn out. As a consequence, CSS has a fine collection of museum pieces that has attracted the attention of heritage specialists and the National Museum.

Another important role Neil has played, along with Carol, was to host the regular weekly get-togethers at their home in Aranda. From the late 1960s, through the 1970s and into the 1980s, Neil and Carol opened up their home to all manner of cavers every Friday evening. It could be argued that more than anything it was these informal get-togethers that wove the fabric of CSS culture. It was at Neil and Carol's that most CSS trips were planned, trip debriefs were mulled over, executive overthrows were plotted and where members developed a taste for some of the finer things in life, which did not necessarily include Ben Ean Moselle or Fruity Gordo Moselle.

In many respects therefore this is a team award. Without Carol it is unlikely Neil would have achieved what he has. She has sustained and tolerated him for all those years.

The Edie Smith Award is named in honour of a former member of CSS and a pioneer of Australian speleology. ASF makes the award only once every two years, for outstanding service to Australian speleology over a long period of time. Neil is a fitting recipient.

Reconciliation at Mt Etna

John Dunkley

The ASF President, Peter Berrill, has been more than a little bit busy with this over the last 18 months. Now you can understand why.

A more comprehensive account of the dispute and its resolution will be published later, but in the meantime we are reprinting (with slight editorial amendments) some messages circulated electronically on OzCavers.

===== 23 September, 1999

Hello Everyone

The Mt Etna reconciliation is now complete. There will be an official ceremony marking the sale of Cammoo Caves to National Parks and the official end to the Mt Etna Campaign. The reconciliation process has taken 12 months to finalise.

A handover and Open Day will take place at Cammoo and will be fully catered for. All are welcome to attend. As soon as we know the actual date, we will let you know.

RSVP ASAP to CQSS. Thank you

Peter Berrill

===== 21 October 1999

Hello Everyone

A date has finally been confirmed for the Mt Etna Reconciliation Day and Opening Day of

Cammoo.

This will be Saturday 27 November 1999. The handover Ceremony and BBQ will be held mid-afternoon. Displays,

information and caving activities will also take place. This date is definitely confirmed and set. Look forward to seeing those of you who can attend on this memorable occasion. Peter Berrill

===== A letter from the President

MT ETNA RECONCILIATION

From our previous mailing you would have read of the reconciliation between the mining company and CQSS.

In July of 1998, CQSS solicitors received a letter from Pacific Lime's (the new company name replacing Central Qld Cement) solicitors stating that they wished to settle the matter of outstanding costs and the monies held in security, now totalling some \$50,000. At the same time I received a phone call from the new mine manager requesting a meeting regarding the above. My first reaction was "here we go again". At the same time he invited CQSS on an inspection tour of Resurrection Cave. This is one of the most highly decorated caves on Mt. Etna and is closed under the control of Pacific Lime. Considering that CQSS had closed the books on the campaign some years back I almost told them to go to hell. However, we had not seen Resurrection for about ten years so I thought that we will see the cave first and then tell them to go to hell. I had never met the new mine manager, Chris White, and on the day of the caving trip he accompanied us. We spoke of the solicitor's letter and he asked me to make a time for a meeting. Immediately I sensed that he was different and that we should listen.

The letter stated that they would release the money only if it was spent on a cave related conservation issue of our

The Saga of Mt Etna...

Thirty years ago this month an (uncharacteristically) brief editorial appeared in this Newsletter. All it said was, simply, "TEXAS COLONG MT ETNA WHAT HAVE YOU DONE?". Conservation battles then undreamt of have come and gone since. We won some, we lost a few. The caves at Texas disappeared under Glen Lyon Dam, Colong was saved, the passionate campaigns over Bungonia, Franklin River, Yessabah and Sellicks Hill came and went. But Mt Etna went on, and on, and on.

Lasting 37 years, the struggle to save Mt Etna caves is the longest running environmental campaign in Australia's history. It reached the High Court of Australia. By then, cavers and other conservationists owed the company \$250,000 in court costs and had various writs outstanding against them. With the law and financial resources and probably most of the local community on its side, the then Central Queensland Cement Co. in 1988 exercised its legal rights, and destroyed some of the caves. With that action it almost destroyed the spirit of many of its protagonists, no doubt a conscious intention. Not then, but in time the company realised that they had won the battle but not the war.

Times change, social attitudes change, and commercial ethics change. Only a couple of years ago we still had a "lose-lose" outcome. But in 1999 the new manager of the renamed & repackaged cement company was an

invited speaker at ASF's 22nd Biennial Conference at Yeppoon, and gave us the opportunity to view the quarry rehabilitation and to once again enter Resurrection Cave.

The deal struck with the cement company is unprecedented, and is hugely symbolic of a sea change in the industry's attitude. It is one thing to accede, perhaps grudgingly, to changing environmental laws and community attitudes. It is something else again to unilaterally make amends. OK, so the company gains, at little financial cost, a warm corporate feeling and a good deal of publicity and public relations. But cavers and conservationists find you can lose the battle and still win the war, if you don't give up. Now there is a victory for common sense and people of goodwill on all sides. Of course, Speaking Tube Cave has gone to fill the cement bags, and in time may well be forgotten. But there are caves elsewhere, perhaps as yet undiscovered, which will be safe forever because, as Keir Vaughan-Taylor says, the mining industry now recognises that what they did at Mt Etna was wrong.

The term reconciliation is very apposite, and is symbolic of a new paradigm emerging for social change at the end of the millennium. It suggests more than just a resolution of the issue, rather a new beginning.

On 27 November we close a remarkable chapter in our environmental history. Let's hope it marks the beginning of a new ethic and that there will never be another dispute like Mt Etna.

Reconciliation at Mt Etna

choosing. This seemed to be half reasonable, so I started making a list in my mind. The most important one that sprang to mind was somewhat politically controversial (nothing new to me) so I decided that for the time being I would keep this under wraps. CQSS treasurer and close caving friend Noel Sands was the only person I involved.

The day of the meeting:

The meeting took place at Pacific Lime's offices and present were myself, Noel Sands, mine manager Chris White and Qld Cement and Lime's Corporate Communications Manager Anne Gambling. Prior to the meeting Noel asked me what I had in mind and I wasn't game to tell him because it was, I thought, way over the top. I told him that we would take the talks as they come. Surprisingly Chris and Anne are quite young, in their early thirties for mine managers, or is it that I am just getting old especially when it comes to the Etna issue? Anyway, Chris appeared to be a little nervous and who can blame him, having to reconcile this issue and being confronted by an old long haired aggressive greenie caver who after 30 years of the campaign is really pissed off. Chris is a kiwi and has an environmental background and straight away I sensed an aura of honesty and sincerity. This mine manager was different. They wanted to know some the history of the campaign and what happened during the direct action. There are some amazing stories and when we told them how we were treated they were physically shocked.

We spoke of a number of issues that we could spend the money on and all the while I was softening him up for the big one. Well, here goes. I want to purchase Cammoo Caves for inclusion in Mt. Etna Caves National Park. The importance of Cammoo's inclusion had been recognised in the draft management plan of 1993. We have been trying to acquire Cammoo for some years but there was a political problem. Chris asked, how much, and I had no bloody idea so I just pulled a figure out of the air, \$200,000. I had negotiated for the return of Henry Shannon's money and after this we had \$35,000 left. We chatted for some time about the issue in general and the importance of Cammoo. It would provide a southern access to the National Park away from Johannsens Cave which is presently used by the Ghost Bats for eight months of the year. This would enhance the survival of the Ghost Bat. Previous to this I had been lobbying the new Minister for Environment on the Cammoo acquisition and felt that they would also contribute funds. Chris then told me that he would round out the figure to \$100,000. As well, all of the outstanding court costs (\$250,000) and writs against all individuals and organisations would be cleared.

This was just the beginning. From here, in brief, I obtained a grant of \$100,000 from the Natural Heritage Trust, Environment Australia, Biodiversity Group. That's another long story. The Qld Dept of Environment came to the party with \$100,000 making the total \$300,000. We not only purchased Cammoo but I also negotiated with Pacific Lime for the hand over of another parcel of land between Mt Etna and Limestone Ridge known as Pilkingtons Quarry.

The deal is done. It has taken me 16 months of negotiations, most of which had to be done in secrecy. We are organising a hand over ceremony and a reconciliation party marking the end to the dispute. Pacific Lime are paying and organising the whole thing including extensive publicity which has to be agreed to by myself. It will be held at Cammoo Caves at The Caves township on Saturday 27 November 1999 mid-afternoon.

ALL ARE WELCOME. Sorry about the short notice. If you can make it please let CQSS know ASAP.

Peter Berrill

===== From Keir Vaughan Taylor:

I woke up one morning and Jeff Kennett was losing the election. This was an omen. Maybe the Australian public is not such a lost cause...anyway I, a non-superstitious person, interpreted it as an omen of a turning tide.

Suddenly CQSS get reconciliation with a mining company !!!!

There is some irony with Queensland mining interests adopting environmental interests in a more genuine fashion than NSW mining interests.

A few years ago Patrick Larkin gave a speech at an environmental conference describing Mt Etna as a "Lose-Lose" situation for both industry and for environmentalists. It certainly destroyed the lives of many good people in Rockhampton and the mining industry has a deep shame that may have been recognised by overseas interests before we environmentally advanced Australian".

Years ago when I went up to help at Mt Etna, I was attracted because I read of the Queenslanders, Craig and Peter and the rest in the caving journals. Somewhat amazed by their achievements, I thought of them as revolutionary heroes. Those of us in SUSS (and others) that became embroiled in the fuss carried an anger that came back to New South Wales. That (Yessabah Caves) was for years a "lose win" situation. We lost Mt Etna but we won in NSW hardened by what we learned from Queensland. In one negotiation with the NSW mining company, one of the first things the representative said to me was "What they did at Mt Etna was wrong".

Although some of the environmental damage at Mt Etna is irreparable, time may heal the wound and this unfolds as a "win-win".

As a final comment, let it be noted that ASF has in this case alone been worth every single dollar that it has ever cost. This development is a priceless achievement

Keir Vaughan-Taylor

=====

Amazing stuff...I am not afraid to mention that a few tears welled in my eyes as I read this email... sanity has finally prevailed in a way that could not have been foreseen...I'm quite

overcome...

Mike Walker (onetime UQSS conservation sec.)

Editors Note: Subsequent to receiving this article, Nick White forwarded me the following email...

Email to Peter Birrell 24/9/99

"Dear Peter

This must be a relief to everyone associated with the campaign. My congratulations in seeing it through. There have been many people involved and many fell by the wayside in the process. The politics have been hard and almost insoluble. I know just how difficult it has been within CQSS. It is fitting that everyone involved participate in the Open Day. My bestwishes for CQSS, ASF and for continued cooperation with National Parks over the management of these caves into the future.

Nicholas White

The Nullarbor

A caver's perspective

Peter Ackroyd

Introduction

The Nullarbor Plain is a big place; a huge limestone plateau stretching 700 kilometres from east to west and extending about 200 kilometres inland from the Great Australian Bight. The tiny settlement of Mundrabilla, not much more than a petrol station and roadhouse on the Eyre Highway, lies roughly midway between its eastern and western extremities.

Nullarbor means treeless but this is not quite the case. Even in the most inhospitable parts of the plain there are a few trees. Here and there, in what at first sight appears a blank landscape, stunted versions of the hardy Weeping Pittosporum are visible. On the southern part of the plain many trees may be seen. Acacias and Eucalypts combine with secondary species such as Sweet Quondong to form low forests nearer the coast.

Surface water courses are, for all intents and purposes, absent. The annual rainfall of about 300mm falls sporadically and flows into the caves, cracks and holes in the limestone pavement. For a couple of days the dusty tracks become impassable if the

rain exceeds 6mm or so, but the karst landscape soon absorbs the moisture and the dust returns. Surface water is limited to ephemeral pools in shallow rockholes. Some rockholes are deeper and the water in them remains for a while.

Navigation can be a challenge. Finding one's way on the plain resembles nothing more aptly than navigating at sea. There are few landmarks and not all the existing tracks are shown on the available maps.

Geology

The limestones of the Nullarbor Plain were laid down after the incursion of the sea into the centre of Australia in the early Tertiary period, about 50 million years ago. First to be laid down was the Wilson Bluff Limestone, a thick deposit of chalky limestone made up of tiny skeletal fragments. Later, as the prevailing conditions changed, came the Abrakurrie Limestone, a reddish, porous limestone containing many fossils.

A brief emergence from the sea resulted in some erosion and

hardening of the Abrakurrie Limestone before a shallow sea once again invaded and the Nullarbor Limestone, a light coloured calcarenite consisting of shell fragments, was laid down in the mid to late Tertiary Period (Maxlow, 1998). At many places along the Great Australian Bight the different limestones may be seen as horizontal bands in sheer cliffs up to 90 metres high.

History

The first recorded attempts at serious speleological investigation on the Nullarbor Plain were those of Captain J Maitland Thomson. He had been a sea captain and his navigation skills were to prove invaluable on the Nullarbor. He was intrigued by a reference to "The Catacombs", marked by a surveyor on a chart in 1880. Over many trips, including, in February 1939, one in which he utilised light aircraft, he successfully located and explored many new and significant Nullarbor caves (Thomson, 1947, 1952).

After the Second World War, two Kalgoorlie School of Mines lecturers commenced searching for caves in the



Cliffs south of Koonalda, Nullarbor Plain. Note different limestone units in cliffs and figure standing on top of cliffs for scale.

The Nullarbor



Entrance of Murrawijinie Cave No. 1 (N-7), looking to the south-east.

Nullarbor as a hobby. Keith Quartermaine and Harry Wheeler started a systematic cave and karst feature recording system in the early 1950s, predating the current ASF numbering system by several years.

These two informal cave exploration groups did not learn of each other until 1952 when Keith Quartermaine and friends joined one of Thomson's expeditions.

In January 1957 the fledgling Australian Speleological Federation conducted its first expedition to the Nullarbor. During this well organised trip detailed geodetic surveys, cave exploration, documentation and mapping and cave numbering using the newly adopted ASF system were carried out.

Expeditions, speleological and sporting, have been to the Nullarbor ever since. Major discoveries have been made and, mostly, recorded, but the Nullarbor is a big place. Anywhere that a 150 metre diameter hole in the plain can become "lost" is a place that could be hiding many secrets yet.

Places

Karst features in the Nullarbor Plain consist mainly of caves, dolines and rockholes. Within the class "caves" is a subset termed "blowholes" which have been defined by the cave numbering body as shafts with less than three metres horizontal extent.

Both caves and blowholes can have very strong draughts. In the case of blowholes, the narrow entrance and

limited extent make the source of this draught puzzling. I recall one blowhole, "Cyril's Rabbit Holes" (N-1237), in which I decided to track down the origin of the strong breeze blasting up the shaft and out the entrance. I eventually chased the air-flow to a network of small tubes of around 20mm diameter which penetrated a narrow band of Abrakurrie Limestone at the bottom of the shaft. Later observations have confirmed that the source of draughts in caves and blowholes is usually a band of perforated limestone.

After the abundance of early cave discoveries in the Nullarbor, new finds became rarer, not least because cavers tended to revisit known caves for sport in preference to conducting

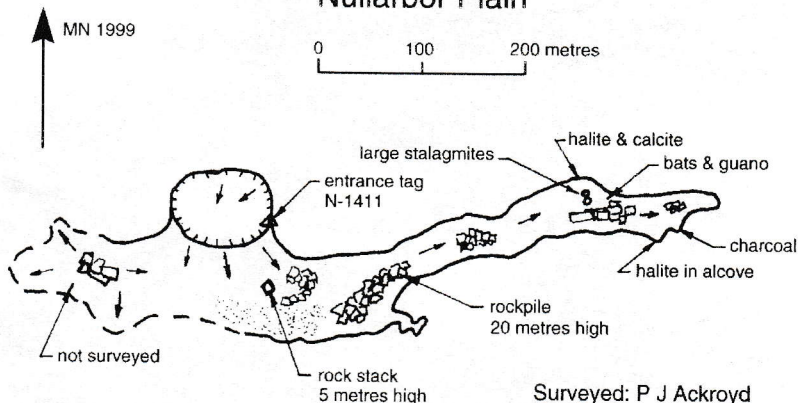
original exploration. This attitude changed in the late 1980s when a group of Western Australian cavers returned to the idea of searching for caves from the air. For about a decade, until the mid 1990s, they found many new caves which, with the discovery of the Quartermaine-Wheeler data at the same time, caused a massive growth in official Nullarbor cave numbers so that there are now over 1,500 numbered features.

Because the Nullarbor Plain has a variation in elevation of only a few metres, searching for caves from ground level can be difficult, even when very close to them. From the air they cannot be missed. Major caves, such as Sentinel Cave (6N-1411), were found from the air in the 1990s. These more recently discovered caves tend to be the focus of numerous cave visitors. During a visit to Sentinel Cave in 1999 with June MacLucas, the well known Australian cave artist, we found a heavily used track leading directly to the cave's entrance. Original reports by the discoverers indicated we should look for boomerangs, digging sticks and Tasmanian Devil bones amongst other things. These items no longer appear to exist in the cave.

The nearby Anzac Cave (6N-1414), also found from the air, has a less obvious track leading to it. Anzac Cave is heavily decorated in parts. Most of the decoration is calcite, with many helictites. In addition, there are several unusual halite stalagmites in some corners of the cave.

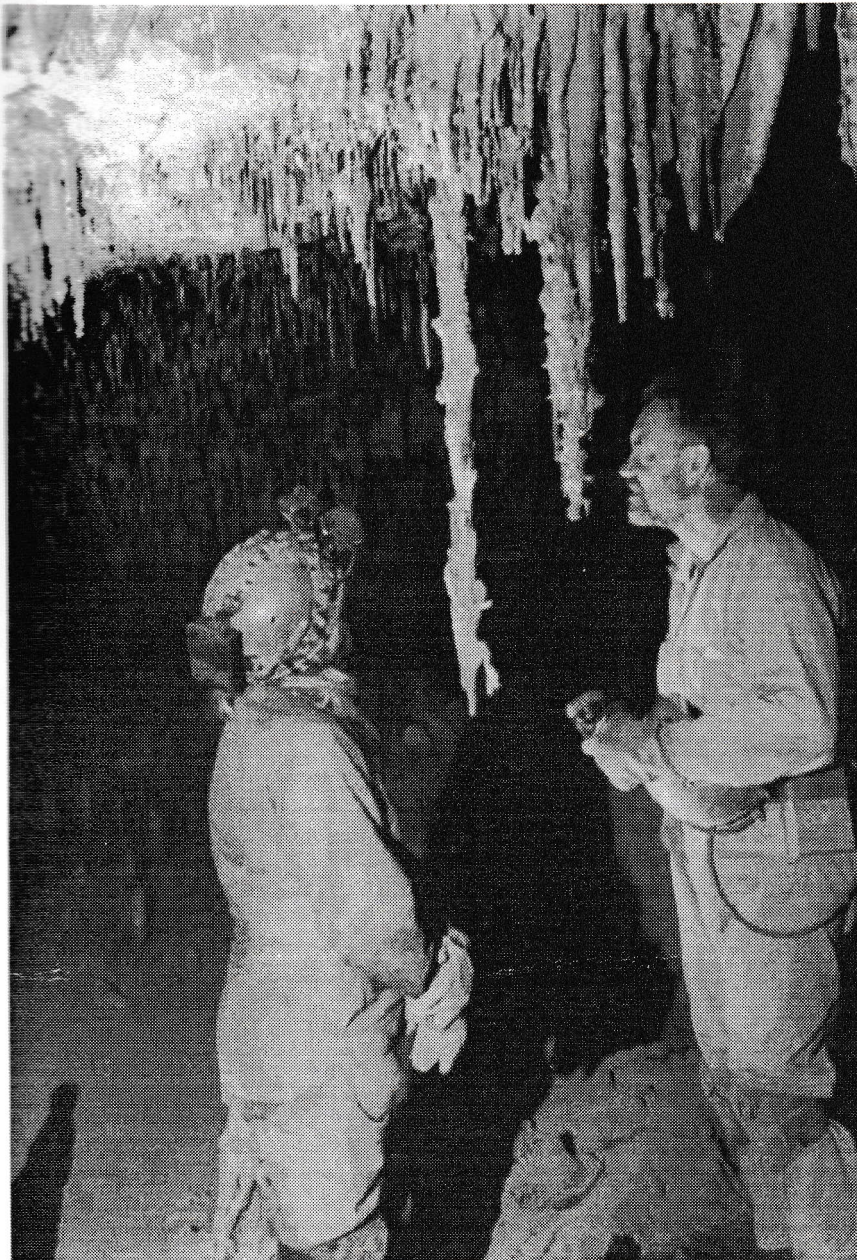
New places may be found within known caves if one is prepared to look for them. For example, a willingness to dig a little led to the greater part of Thampanna Cave (6N-206) being discovered (Boland, 1998). Similarly,

Sentinel Cave (N-1411) Nullarbor Plain



Surveyed: P J Ackroyd
Date: 21 April 1999
Grade: ASF 22
Drawn: P J Ackroyd, Apr 1999

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June MacLucas and Ken Boland examining decoration in Anzac Cave (N-1414).

during an April 1999 trip into Old Homestead Cave (6N-83), some crawling was all it took for us to find a significant extension leading from the "Officers Mess" into unknown territory. A couple of hundred metres of "mopping up" survey soon extended the "North Cave" portion of Old Homestead well south of its known limits. Some unusual frostwork decoration was also found on this three day trip to the cave. The opportunity for more discoveries in the cave is huge.

Nor is it caves alone which hold the allure of new discovery. Rockholes are karst features too, although they are often ignored by modern speleologists. Interestingly, and perhaps revealingly, they were recorded by Thomson and the Quartermaine and Wheeler team during their respective exploration trips.

The latter included rockholes in their karst feature numbering system. This clarity of thought has only recently been emulated by modern speleologists, and rockholes are now recorded in the Nullarbor.

One noteworthy rockhole which springs readily to mind is Thampanna Rockhole. This feature was marked on the map and lent its name to Thampanna Cave. For many years it was impossible to find the rockhole, as it had been plotted incorrectly on the maps. In 1994, by reviewing and recomputing the original 1888 survey data, the correct position was determined and we were able to relocate it (Ackroyd, 1998).

Rockholes such as Thampanna had great significance for the original inhabitants. They, together with a few caves which contained lakes, were the

sole sources of reliable water on the otherwise parched limestone of the plain.

Reminders of the Past

On any trip to the Nullarbor you are constantly reminded that you are far from being the first person there. From the evidence left by generations of people mining chert (flint) at an aboriginal quarry at Wilsons Bluff to the vast collections of chert flakes to be found around rockholes many kilometres from the original source, you arrive at the impression that here was a culture that utilised every resource the land had to offer.

Occasionally, in the more out of the way parts of the Nullarbor, rockholes still possess their original coverings of flat stones placed to limit evaporation. Careful searches around such rockholes can reveal chert chips where someone long ago patiently shaped a new cutting tool. Sometimes a peculiarly shaped groove or hollow in a rock can, with observation, show itself to be man-made, possibly for the purpose of sharpening a bone tool or grinding seeds for food.

Underground too, you can come across reminders of past inhabitants, animal and human. Bones, or more rarely entire mummified carcasses, sometimes of beasts long extinct, may be spotted in obscure corners of some caves. Handprints are known in a few caves and, less often, finger markings and scratched patterns. In at least one cave there is evidence of chert quarrying and tool making, a few hundred metres within its interior.

The very cave decoration, now mostly dormant (except for the evaporites, halite and gypsum), attest to a long ago climate of higher rainfall. Reinforcing this evidence are the ancient bones of locally extinct grazing animals and animals that hunted the grazers. Now only the hardiest animals exist in the Nullarbor. Generally these are nocturnal and hide during the day, usually underground in burrows. The Nullarbor is a harsh place in which to survive, but it was not always so.

People of the Nullarbor

While in the Nullarbor you learn more about your fellow cavers. Nullarbor caving is not to be rushed if you are to make discoveries. You need to be a patient and reasonably experienced caver or speleologist to find new underground rewards.

A small group, gathered together with the love of caves as a common factor, soon reveals the interactions

The Nullarbor

between party members and idiosyncrasies of individuals. It is also a sure way of discovering their real attitude to the environment.

You learn patience in the Nullarbor. Patience with people and patience with your caving. I learnt another sort of patience on my last trip. Try hanging from your arms on a wire caving ladder for most of the day while acting as a human-sized scale factor in an underground cave painting.

Mostly, of course, you learn more about yourself. Alone in the Nullarbor, and you don't need to go far from the

group to feel truly alone, there are no other living things in sight, clear to the horizon. You cannot fail to feel an icy apprehension, leavened with the warmth of excitement, within yourself.

The words of advice given to me prior to my first trip to the Nullarbor Plain come back to me often, "The Nullarbor is not so much a place as a state of mind."

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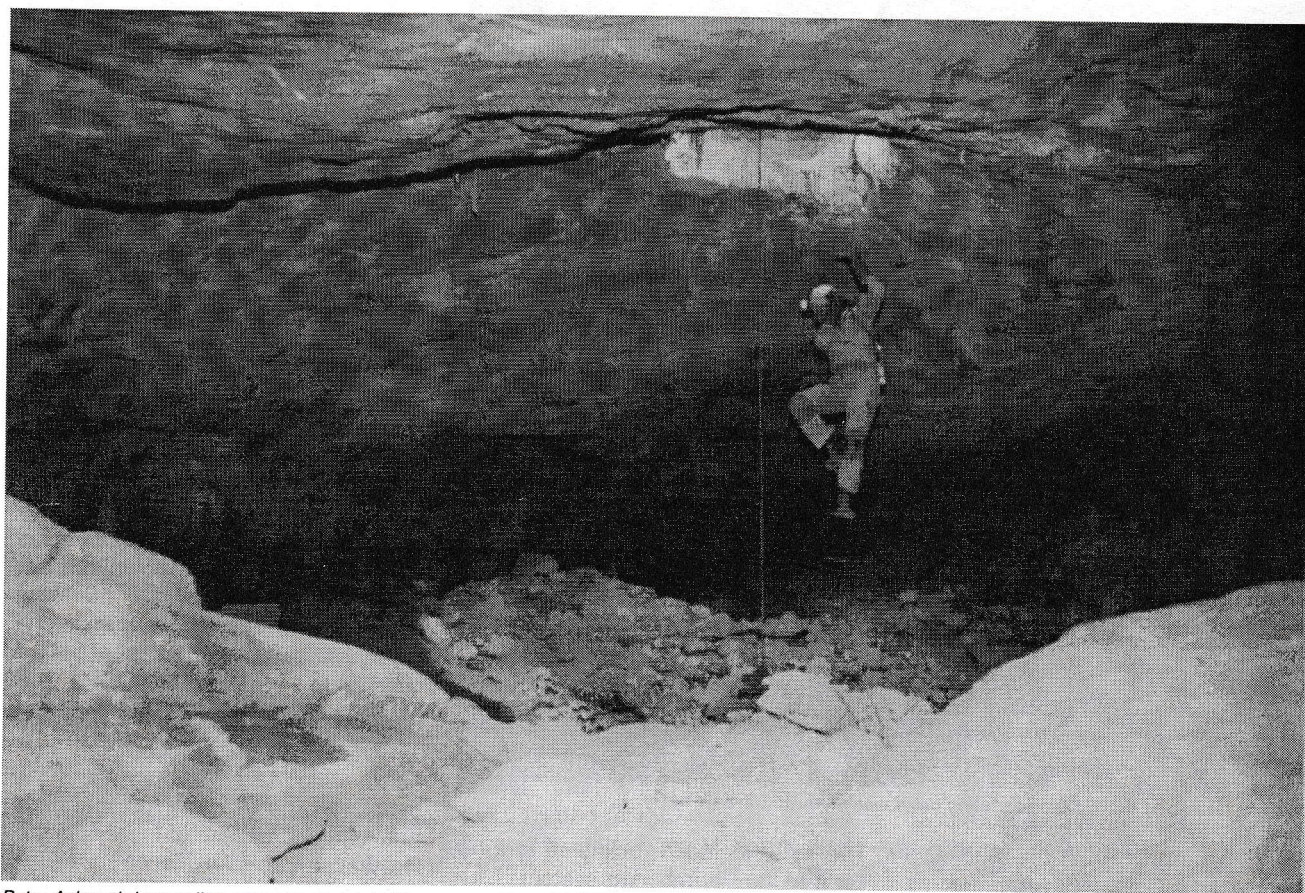
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Peter Ackroyd descending entrance pitch into Thampanna Cave (N-206).

If you go

Many of the more popular caving areas in the Nullarbor Plain are on leasehold property. You will need to arrange access prior to your visit. Some properties may request a daily fee for each person in the party. This is to pay for wear and tear to their private roads and to cover any damage to other assets.

All water must be carried by the party. Allow five to ten litres per person per day (depending on how clean you wish to feel). While not entirely treeless, trees on the Nullarbor become very few and far between beyond about 50 kilometres from the coast. Gas fuelled stoves are less environmentally damaging than using firewood.

It takes two to three days from any of the major population centres of Australia to reach the heart of the Nullarbor. It

can be done in less time, but at an increased risk. Once in the Nullarbor, travel to the caves is via dirt tracks. While rain is relatively rare, if more than 10mm falls at once you are probably going to have to wait a day or two till the track dries out. Becoming bogged is almost certain if you attempt to travel during or immediately after such rain.

With few trees, wind and heat can be a major nuisance on the Nullarbor Plain. If out walking, dehydration can quickly become a serious problem. Take adequate water with you. Devices using the Global Positioning System (GPS) have made navigation on the Nullarbor much less troublesome than it once was. However, it is wise to not rely on such devices. A GPS with flat batteries is just ballast. The security of a compass and map is hard to beat.

Khazad-Dum

Setting the Depth Records straight 27 years on

Jeff Butt

Apparently significant errors do happen; sometimes they get written into the record books and stay for a very long time. Whilst doing a bit of surveying work on the Khazad-Dum/Dwarrowdelf System (in the Junee-Florentine area in Tasmania) during June this year it became apparent that Khazad-Dum (KD) did not have the historically (since 1972) quoted depth of 321 m (1054') (e.g. Matthews, 1985), in fact the depth (JF4 tag to Sump 1) was significantly (try 50 m!) less, at around 267 m (or 876'), well below the magic 1000' mark of the time.

No this is not an aberration, I have checked and rechecked my data (details below). In fact, when I look at some of the original 1973 Grade 5 survey data (Shaw et. al, 1973), it actually gives this very same result! I find the fact that this result was 'overlooked' rather surprising!

An Historical Perspective

An Australian depth record of 950' (290 m) was claimed for a trip down KD over 23-24/1/71 (Kiernan 1971); a Grade 2 survey was also published. In early March 1972, KD was bottomed (Kiernan 1972) and an Australian depth record of 1020' (311 m) claimed. This depth was called 'estimated', and I believe was based upon an altimetric survey. [Altimetric surveys, if done with care can be quite accurate; certainly better than ~20% overestimate.] At the time, the second deepest (around 800') cave was Tassy Pot (JF223).

Montgomery (1973) presents a Grade 5 survey of Dwarrowdelf (JF14), which shows a depth of 836' (255 m) to the base of the final KD waterfall. A Grade 5 survey of KD was conducted by Peter Shaw, Phil Robinson, Kevin Kiernan and Lamonis Kavalieris in 1973 (Shaw et. al. 1973); this data gave KD a depth (from the JF4 tag to

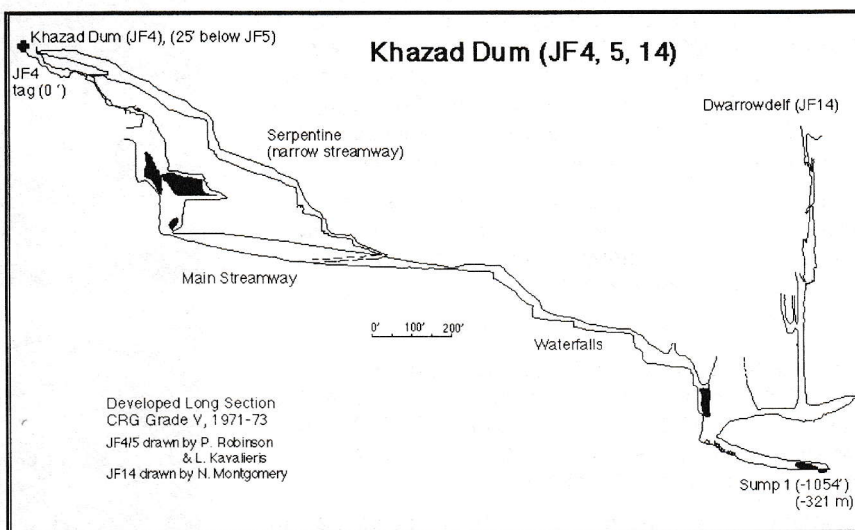


Figure 1. The Khazad Dum system as it has been known.

Sump 1) of 264 m (866'), but I cannot find any mention of this reduced depth anywhere in the literature.

Robinson et. al. (1973) presents a very fine survey (a schematic version is shown in Figure 1.) of the KD system (KD and Dwarrowdelf) showing a depth of 1054' (321 m) (from the JF5 tag to Sump 1); drawn by Montgomery (JF14 side), Robinson and Kavalieris (JF4 side). But, in this rendition of the survey (claimed to be Grade 5), the drawing of the JF4 side does not appear to have made use of the Grade 5 survey data (Shaw et. al. 1973) which Robinson and Kavalieris were involved in collecting. [In this drawing the 'extra depth' is 'obtained' by having the stream-ways drawn with a significantly greater slope than they actually possess; and the JF4 entrance is shown to be about 180' higher than the JF14 entrance.]

Who knows the real story; perhaps it was difficult to relinquish the cracking of 1000' depth and/or admit making an over-zealous depth claim in the hey day of competition for the deepest cave in the country.

Despite being only 274 m deep (JF5 tag to Sump 1), KD did indeed deserve (but only narrowly) the top spot from Cauldron Pot (JF2), then quoted to have a depth of 263.4 m (Ellis, 1975 & 1976) until Ice Tube topped that in 1981, and Annakanda topped that soon after.

The Actual Situation

Much survey data has been collected over the years, but there is a high attrition rate for a variety of reasons, e.g. poor archival procedures, people moving interstate, lost or missing data, hard-disk crashes, viruses etc. etc. Several of us in STC are trying to prevent this from continuing by collating and backing up existing



Khazad Dum waterfall - photo Steve Bunton

Khazad Dum

data and replacing missing data sets. For this reason we chose to re-survey Dwarrowdelf (JF14) [Butt et. al. (1999a)] and to tidy-up some of the remaining leads in KD outlined by Eberhard (1992). The proximity of both Troll Hole (JF233) and DribbleSpit Swallet (JF13) to the KD system made it worth while to link these entrances into those of JF4 and JF14 as well. So, in June this year, we completed an overland survey between JF14 and JF4 [Butt et. al. (1999b)]. The net result was that we had a survey loop, from the JF14 entrance across the surface to JF4 and back via an underground route (the underground surveys were joined at the base of the final pitch in KD). Figure 2 shows a schematic of these traverses.

The vertical closure obtained was 0.5%, i.e. a mis-closure of 2.5 m over a vertical range of around 500 m. The errors were distributed over the loop, and the following results obtained:

- JF4 tag to Sump 1 has a depth of 266.5 m

• JF14 tag to Sump 1 has a depth of 265.4 m (i.e. the JF14 tag is 1.1 m lower than the JF4 tag). [Montgomery (1973) obtained a figure of 836' (255 m) for this survey, but did use rope lengths to measure the long pitch (under-estimated by about 4 m).]

Martin and Worthington (1979) surveyed (no clinometer) from Sump 1 to Sump 2 and estimated a depth increase of 1.6 m, but stated that because of inaccuracies, the increased depth could not be put at more than 1 m. Hill (1987) dived Sump 2 in poor conditions (the sump was flooding at the time, I was a porter for this exploit), and estimated he achieved a depth of 10 m. Historically, the JF5 entrance is the highest entrance into the system, and this is stated as (but has not been verified) 25' (7.6 m) above the JF4 entrance by Robinson et. al. (1973).

So all up, the current best estimate for the depth of the KD system (from the JF5 tag to surface of Sump 2) is 275 m, or 285 m if you go to the 'bottom' of Sump 2.

Thus in the current Deepest Caves List, KD should be moved from position 4 to 5, as shown below.

1. Niggly 375 m
2. Annakanada 373 m
3. Ice Tube-Growing Swallet System 360 m



Khazad Dum final pitch - photo Steve Bunton

4. Cauldron Pot 305 m
5. Khazad-Dum System 285 m

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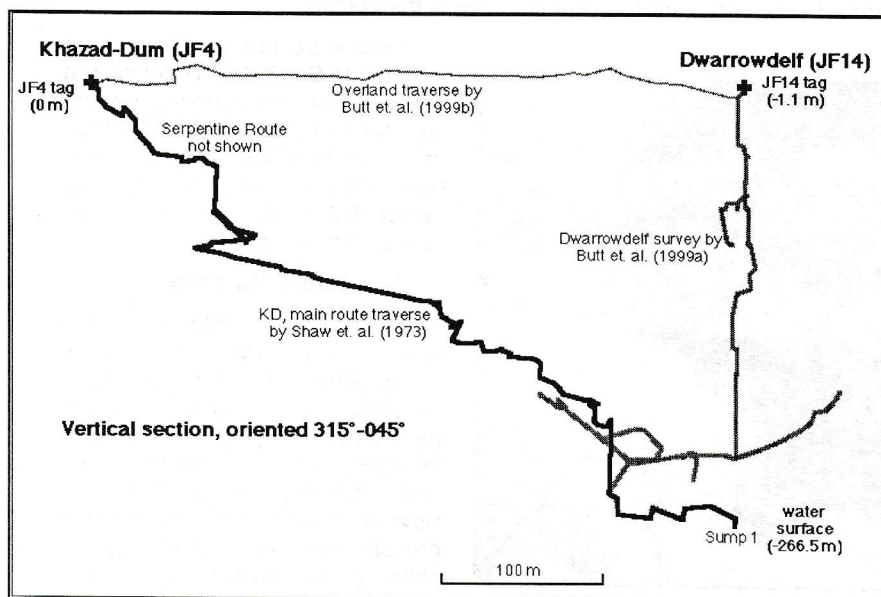


Figure 2. A survey traverse through the K.D. System.

A Fishy Cave Diving Story

Stefan Eberhard

There are a lot of cave maps which show a sump at the limit of explored passage. Most often this represents the end of the cave, but not always - it sometimes signifies the beginning of the rest of the cave!

After the 1998 WASG expedition to the West Kimberley I ended up in Kununnurra. Robyn McBeath joined me here and we spent about 3 weeks exploring the local region. Whilst in Kununnurra we enjoyed the company and hospitality of David Woods, Donna & Joe Cavlovic. Joe is Donna's uncle - a new Australian immigrant from Yugoslavia, he came here well before northern Australia became a popular tourist destination. Uncle Joe was quite a character, an expert bushman and fisherman with a great knowledge of the local region. The harsh and unforgiving, yet stunningly spectacular East Kimberley had been his backyard playground for decades - he knew the names of all the big crocs, and where they lived. He was a real life Dundee of sorts, with a repertoire of survival tricks and stories which he continually entertained us with. My own romantic notion of the great Aussie bushman was challenged upon meeting Joe, for here was a man who likely knew as much about the Australian bush as a black fellow, and yet he spoke with a strong Slavic accent!

One of Joe's stories I recall was about his bulldogging of the wild Kimberley cattle. These beasts can be aggressive and will chase humans. Joe would first run to taunt and tire them, then position himself to take the final charge, making sure he was standing behind a small mallee-like tree with numerous stems. The horns of the charging beast would become entangled in the stems whereupon Joe would grab them. I accepted this tale with scepticism at first, although at fifty something years of age, Joe was still lithe and fit. Later, I had good reason to doubt my scepticism.

The unnamed cave KNI-19 is located in the Ningbing Range, East Kimberley. The cave acts as an occasional flood overflow - about a hundred metres of low passage leads to a sump pool with bat guano in it. The cave is an important roost site for bats at certain times, although on this occasion the bats were absent. The cave supports a population of banded cat snakes, which dwell in nooks and crannies in the ceiling. When the bats are present the snakes hang from the

ceiling and catch the bats in mid-flight. KNI-19 is also important for invertebrate fauna - the cave contains a number of troglobitic species, both terrestrial and aquatic. Whilst there we collected a new species of *Tainisopus*, an ancient and extraordinary aquatic crustacean - this being the first record of the group from the East Kimberley.

The *Tainisopus* was collected with the aid of a dive mask and underwater torch which I had brought along for the purpose of checking out the sump. The water in the sump was clear, at least initially, so long as care was taken to avoid stirring up the silt. I could see airspace about 4 metres away so dived through with a guideline. David then dived through and we found ourselves in a circular chamber with another sump. This next sump extended beyond the limits of breath-hold diving but looked promising so we resolved to return with scuba gear.

We all returned to KNI-19 a few days later with a set of small twin tanks. Everyone came through the first duck, except Joe who had never done much caving before. Robyn, Donna and David waited in the air chamber whilst I explored the next sump. The water was crystal clear with a green tinge. The passage twisted and curved smoothly - the phreatic sculpting was spectacular. I came to an opening which was shaped like an triangle. Like peering through a small window, this opening overlooked a large spherical room - a pressure dome with coloured horizontal banding showing the layers of limestone. The water must really swirl through this place at times during the wet season I imagined, but now it was still and quiet as I drifted weightless into this extraordinary room. I was beginning to really enjoy myself, and fancifully considered that I might be dreaming until I was alerted by the fact there appeared to be no way on. I circled the dome searching fruitlessly, then sank onto a dismal pile of rocks in the middle of the floor. The rocks seemed to be effectively blocking the bottom of a plughole, but to my surprise beneath an innocuous looking lip of rock lay the way on.

The continuation was restricted and abruptly brought my focus back to the business of carefully positioning the line. My tanks were scraping the roof and my belly was scraping the floor as the silt stirred-up began to obliterate the visibility. My instinctive urge was to terminate the dive here but although

the conditions weren't pleasant they weren't especially hazardous, so long as I kept my composure. I stopped for a while to consider the situation - the passage continued quite low but still passable. I had plenty of air and guideline, one torch was dead but two others were still working - the only blockage to further exploration was in my head. A short distance further on the passage broke air surface after a dive of 130 metres length. I shed my gear and climbed out of the water. About 30 metres on there was another sump. I left the exploration of this for next time, which will be easier with two people to handle the gear. After an absence of about an hour I returned to the others still waiting patiently, then we exited the cave.

When younger I explored plenty of horrible cold, silty sumps in Tasmanian caves, but for years I have dreamed of being the first to explore a virgin passage full of beautifully warm, clear water. That dream had finally been realised in KNI-19. The discovery was both a physical and personal one. The personal discovery was managing the potentially stressful situation in a positive manner. At last the years of dull training dives, huge gear expenses, and absurd amount of organisational messing about became worthwhile. Many people misperceive cave diving as a dangerous activity, but safety standards have changed a lot. With good training, good gear and the right attitude, cave diving becomes a routine involving less risk than crossing a busy street.

Back in town that evening Robyn off-handedly commented to me how it would be great to have fish for tea. Joe overheard this and said, "You want fish? OK I'll see what I can do." He then took off in his ute but was back within half an hour. We figured he might know a mate with some fillets in his deep freeze, but our jaws dropped when we looked in the tray of the ute and saw a 20 pound barramundi still wet and writhing. We could hardly believe that he had hooked this monstrous delicacy just minutes before at the town river crossing, yet Joe's casual, honest demeanour did not imply that a clever trick had been played, nor could it have been since there were no fish farms in town. That fish tasted very sweet indeed, and with a bottle of wine to wash it down we believed every word of Joe's story telling that evening.

CAVE RESCUE SERIES

No 2. - Spinal Injuries

By Mark Somers (This article first appeared in Nargun)

It is a general medical and first aid practice that the management of any fracture requires careful handling as well as immobilisation of the joints above and below the site in the injury to prevent further movement. It has been clearly documented that careless or rough handling can cause more serious damage.

The spine is made up of 33 bones called vertebrae. These vertebrae are classed in various groups depending on where in the spine they are. From the top down, the first seven vertebrae are known as cervical (in the neck region), the next twelve are thoracic (upper back), then the five lumbar (lower back), and then five sacral (fused together in the sacrum) and finally four coccygeal (which are also fused into one or two bones known as the coccyx or 'tailbone'). All these vertebrae are joined by discs. These discs comprise an outer ring of cartilage and a softer inner centre. They allow limited amount of movement as well as absorbing most vertical shocks. When we combine the effects of all the joints in our spinal column, we get the range of movement to allow us to bend and twist. Should we go beyond our normal range, then the risk to the bone, discs, muscles or other structures is increased.

When a person injures their spine, the signs or symptoms they display can vary considerably from person to person. This is because the spine houses the spinal cord. The spinal cord carries the various electrical impulses up to, and down from, our brain to all areas of the body. Damage to the spine or the surrounding structures may upset these electrical signals. Depending on which signals are involved will vary the signs or symptoms.

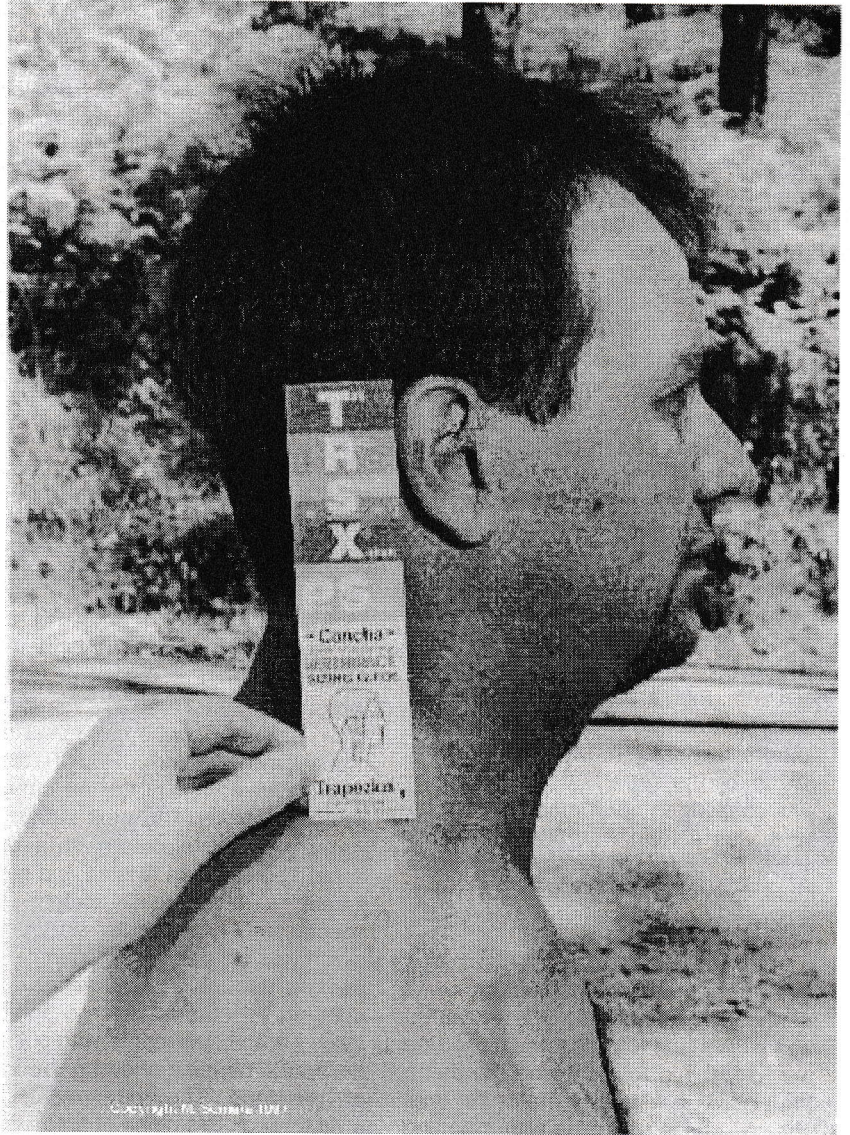


Diagram 1

As I listed in the last article, the following situations have the highest potential to cause spinal injuries:

1. Falls from heights greater than 1.2 metres particularly if landing on feet or buttocks.

2. Significant blows to the head (i.e. rock falls, falling equipment, falling persons, standing up when there is not room, etc.)

These situations highlight that the single most important factor in determining if a person has, or may have, a spinal injury is HISTORY.

Some typical spinal sign or symptoms are:

1. Pain in the neck or back
2. "Pins and needles", "electric shocks" or other strange feelings below the site of the injury
3. Unconsciousness, even briefly, after a fall
4. No feeling in limbs or ability to move limbs

5. Breathing difficulty

6. Slow pulse (50-60 beats per minute)

7. In male patients, an erection.

The basic principles of treatment of an unconscious patient would be to follow the basic life support principles of:

DANGER

RESPONSE

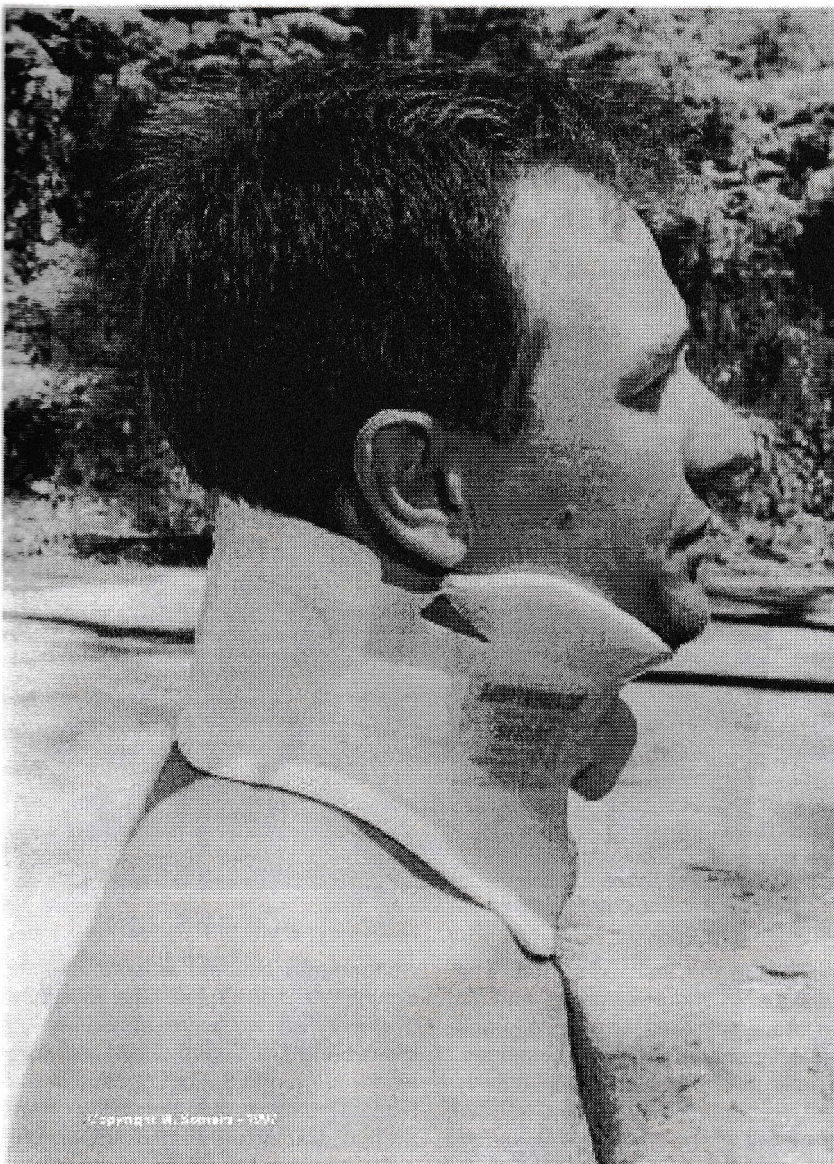
(if unconscious turn on side carefully)

AIRWAY

BREATHING

CIRCULATION

If the patient is conscious then leave them alone. On arrival, the ambulance personnel will perform a more detailed assessment before packaging the patient for



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Diagram 2

retrieval. Packaging the patient includes splinting, stabilizing and maintaining body temperatures. Other factors, such as total time underground, physical space and patients condition would also be taken into account when determining the treatment plan.

One of the first items, to be applied will be a cervical collar or "C" collar. When applying a collar, the ambulance officer will ensure the head is in a neutral position, (refer to diagram 1), and the neck size is measured between the exposed skin on the shoulder and the opening of the ear using a special sizing guide (refer diagram 2). The collar is then bent into shape, applied to the bare skin of the chest, and slid up towards the neck. Once in place, the rear of collar wraps around and attaches via Velcro. One essential point to remember with any piece of equipment is its limitations. Even the best cervical collars only restrict movement by 50% of the normal range and so, must not be used in isolation. It should be remembered that the benefits of this device in immobilizing the patient's spine far outweigh any inconvenience to the rescuers, even in the confined and awkward environment of a cave.

After application of a cervical collar, the next step will be to apply further extrication devices like those that I will discuss in following articles.

Bibliography

Mark Somers is a Clinical Instructor with the Metropolitan Ambulance Service in Melbourne. Mark also operates Adventure Tag Along Tours, an outdoor adventure

pursuits tour company and has had many years caving and rescue experience. He is a member of the Victorian Speleological Association and the Caving Club of Victoria.



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Left: Cervical collars

Vietnam 99

Steve Milner



Stunning Remnant Caves near Tra Linh, Cao Bang Province © Vietnam '99

Introduction

This article presents a snapshot of the fantastic caving achieved in five short weeks by the 1999 Expedition to Vietnam. The strong team discovered nearly 20km of virgin cave in the Cao Bang and Quang Binh Provinces, and also discovered a new cave area with stunning potential. The expedition was partly supported with grants from the UK, and supported with the generous assistance of our friends from Hanoi University and the People of Vietnam.

Cao Bang Province

The first two weeks of the expedition took place in the beautiful province of Cao Bang, in the north of Vietnam close to the China border. After the formalities with the Peoples Committee of Cao Bang, our first task was to head for the magnificent cockpit karst and the village of Ha Lang to follow up the leads left by the expedition two years before. Westerners are a rarity in this part of the country and we provided quite a spectacle when we arrived in our convoy of Chinese Jeeps and donned our wetsuits for the river caves. On the first day, the entire team entered the cave of Nguom Sap and set about to explore and survey all the leads left

behind from the last expedition. The cave was big and easy-going, and full of fine calcite formations and beautifully shaped phreatic passages. We split into four teams and quickly found a couple of kilometres of cave, and tantalisingly, we found a second entrance to the cave in another doline. The next day a small group of us went in search of the second doline and it turned out to be very easy to find using the cave survey and a GPS. The second doline was completely enclosed, perhaps 1km in diameter, cultivated and easy to explore. We quickly located the river that came from Nguom Sap, and followed it across the doline to where it sank at the foot of a sheer cliff. We followed the river underground and were rewarded with a superb cave that took us two days to explore, survey and photograph. The local people called this cave Nguom Lung Sam. This cave was a lot more difficult to traverse than Nguom Sap as we were forced to follow the water which was quite fast in places. There was also a massive abandoned oxbow that was a pleasure to explore and photograph. [Insert photo 'Nguom Lung Sam.tif' near here. Caption 'Oxbow in Nguom Lung Sam, Cao Bang Province © Vietnam '99']. After exploring the system we found that Nguom Lung Sam came out in another doline and that the river

disappeared into the limestone once again. We didn't have time to chase this river as we were scheduled to move on to Tra Linh to check out more leads. We found 6.9 km of cave in the Nguom Sap / Nguom Lung Sam system and a further 1.8 km in four other caves in the Ha Lang region.

The Tra Linh region did not disappoint us. We found plenty of stunning scenery, great caves, remnant caves, resurgences and sinks. None of the caves were particularly long but the scenery made up for it.

We then moved on to the Ha Quang region where we stayed in an army barracks as guests of the military. The local commander kindly turfed out the squaddies and gave us a dormitory. This region proved to be soul-destroying as we did a lot of legwork with little reward. The karst was magnificent, but unlike the lush scenery only tens of kilometres away at Ha Lang, it was semi-arid and treeless, the ground was very poor and few people lived there. We found only three caves but one 'went'. Cam Thon was found in a small doline near the top of the karst, amazingly this cave was open and we were free to descend an alpine-style sinkhole. We were completely unprepared for this style of cave and used up the entire expedition supply of rope in one fell

swoop. We quickly descended seven short pitches and numerous short climbs until we were thwarted at the top of a huge void, with at least 30m to the floor. We rigged the last pitch with our remaining 15m of rope, just to have a quick look and to make sure that the cave continued. This cave or one like it could be the key to the area and maybe lead us to the master system below. The vertical potential is about 800m, and the nearest known resurgence is over 10km away.

With insufficient gear and no leads we moved on to the Trung Khanh region where we were again rewarded with half a dozen caves. The caves were generally short but they made up for it in beauty. In two days we found 3.0 km of great caves but once again we had to move on. On our way back to Hanoi, we chose a route that was to take us through a spectacular karst area. We noted high-level sinks and a massive resurgence over 7km away and a vertical range of 200-300m. This area will be one of the primary targets

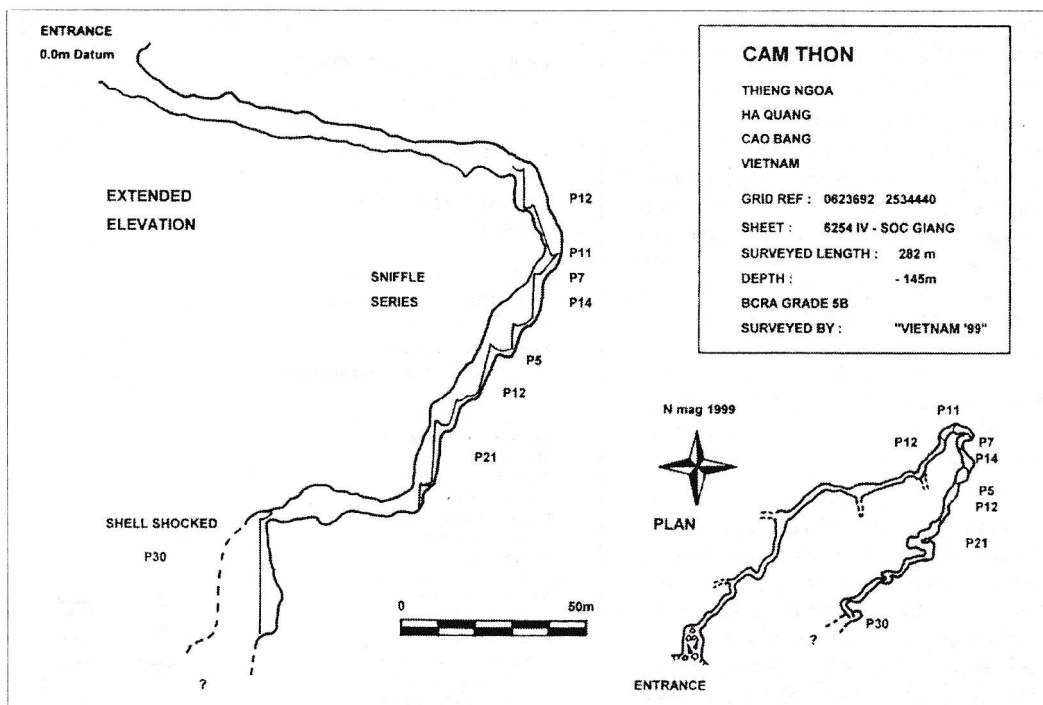
for the next expedition.

In two short weeks we found 12.5km of new cave and opened up plenty more opportunities. It seems that the Cao Bang Province will continue to deliver superb caves on our return.

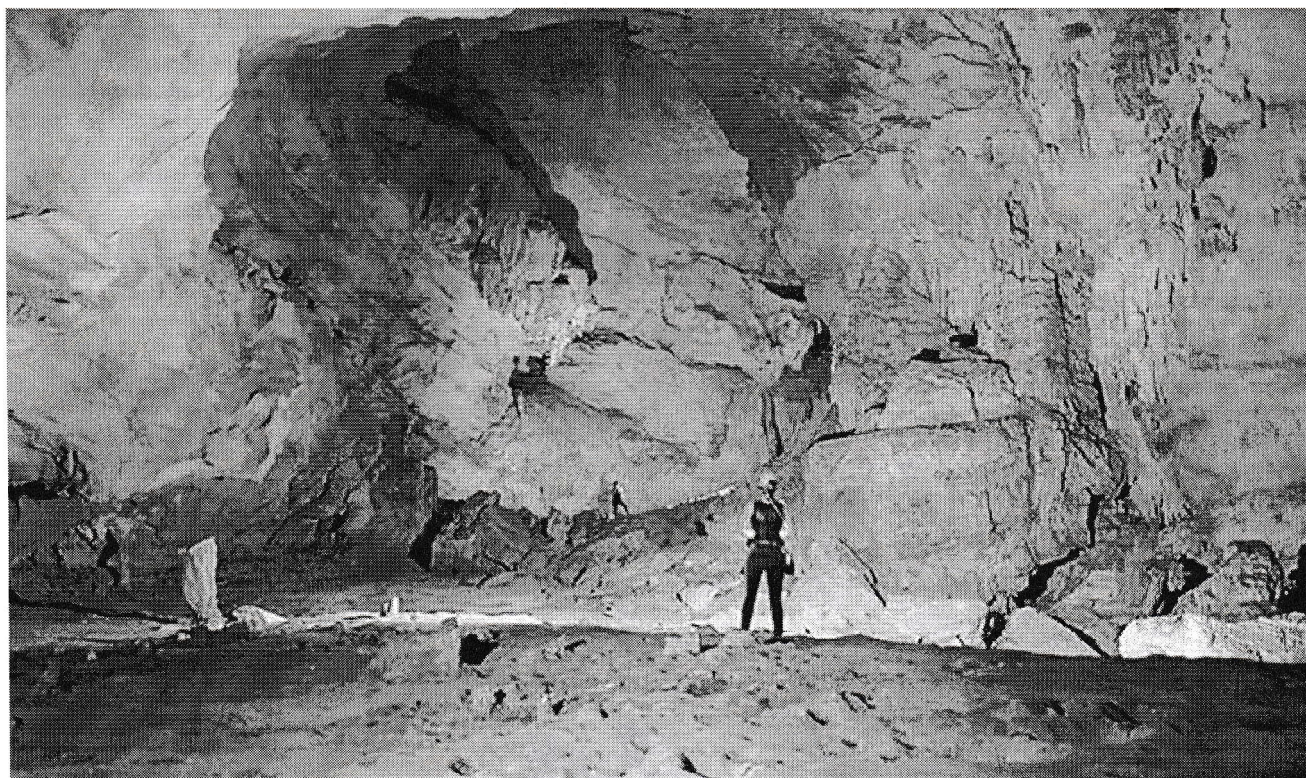
Quang Binh Province

Quang Binh Province is an overnight train journey south from Hanoi. We were greeted by the

Peoples Committee at Dong Hoi and were treated as formal guests of the Province. After the formalities we were driven to our luxury base camp at Son Trach near the unique and brilliant tourist cave Phong Nha (nearly 1km of the cave is traversed by boat). We sorted out our gear at the new guesthouse and split into two groups, one to explore and survey the recently re-discovered 'Dry' Phong Nha cave, and the other to push Hang Khe Rhy.



Unfinished Vertical Cave, Cao Bang Province © Vietnam '99



Oxbow in Ngum Lung Sam, Cao Bang Province © Vietnam '99

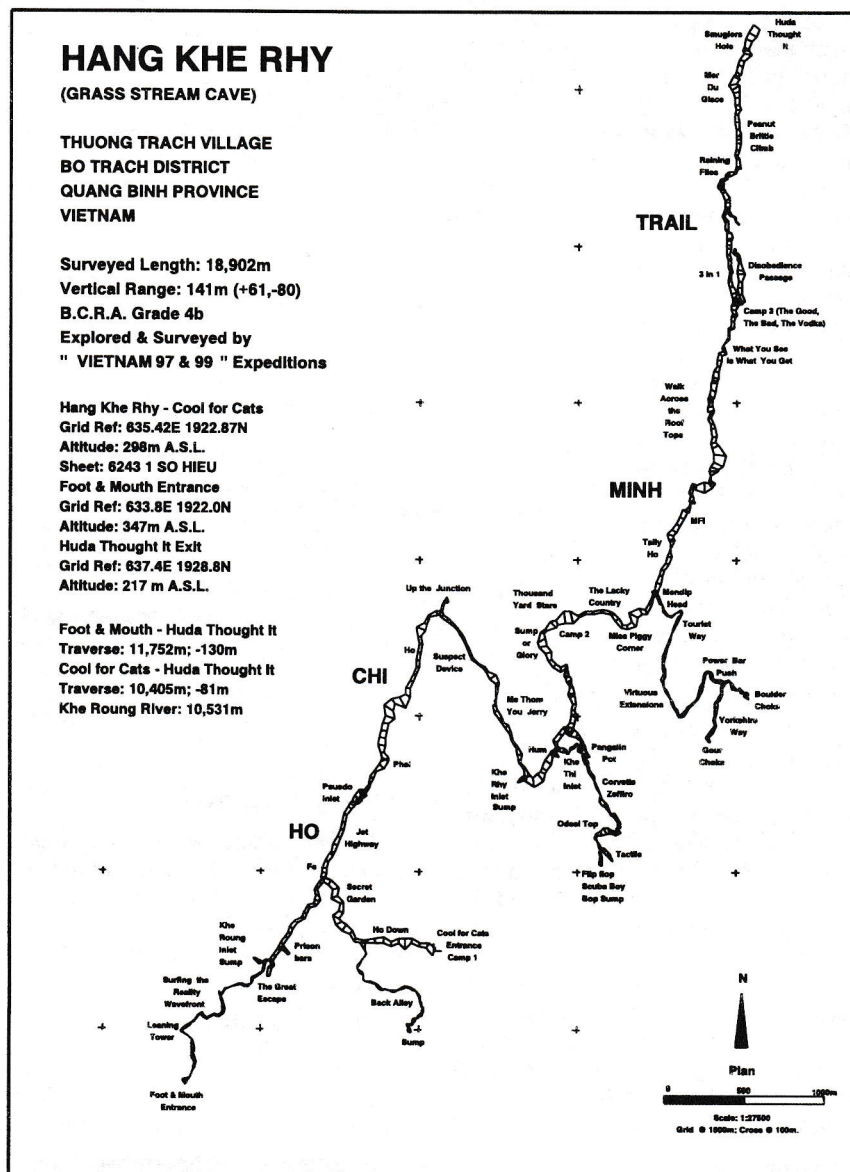
Vietnam '99

We were going to have a look at one of the best leads that had to be left by the 1997 expedition.

We were pretty tired by the time we arrived at the cave entrance of Hang Khe Rhy. We had come 8 hours along the Ho Chi Minh Trail on a hired ancient Chinese 6x6 Jeep/Truck, we had kipped overnight in a remote village called Ban Ban, and had trekked some 5 hours through unspoilt jungle along ancient tracks made by the 'minority' tribes of Vietnam. We were now at the foot of a big limestone cliff where a large river disappeared into the darkness.

Two years ago, my caving companions Deb Limbert, Pete (Snab) McNab, Martin (my-body-is-a-temple) Holroyd (and others) had pushed Hang Khe Rhy to 13,817m long. They pushed as far as resources and time had allowed but left an astonishingly huge lead about 9km along the main river passage and named it 'What You See Is What You Get'. WYSIWYG was a passage perhaps 30m wide and 40m high, chockers with massive calcite formations, and with a glorious slow moving river running thorough it. Now it was our turn, Deb, Snab and Martin returned with myself and Mick Nunwick, John Palmer and Nguyen Hiêu. We put our wetsuits on, shouldered our 25+ kg packs, said farewell to our porters and guide from the nearby village and to our military escort, and promised to meet them back at the same spot in four days time.

We had a survey from the 1997 expedition [Insert map 'Hang Khe Rhy.wmf' near here. No caption] and lots of question marks to follow up, but our immediate objective was to set up a camp, 6km along the river passage, just beyond Sump or Glory. The river cave was big and spectacular and the route was fairly easy-going. We knew when we were at Sump or Glory, as it was preceded by a 250m swim. The length of the swim concerned the non-swimmers as there were no resting places, but in the water our huge packs could be used as a flotation devices to make the going easier. Unlike the previous sections of the cave, which were noisy with running water, the swim was silent and the roof was low and gloomy. The only sounds were the lapping of water, and the hiss of the carbide lamps. Sump or Glory was open and we had at least 0.5m of headspace to play with. We set up camp just beyond the sump and put little sticks at the waters edge to monitor the water levels and went about our business to settle down for



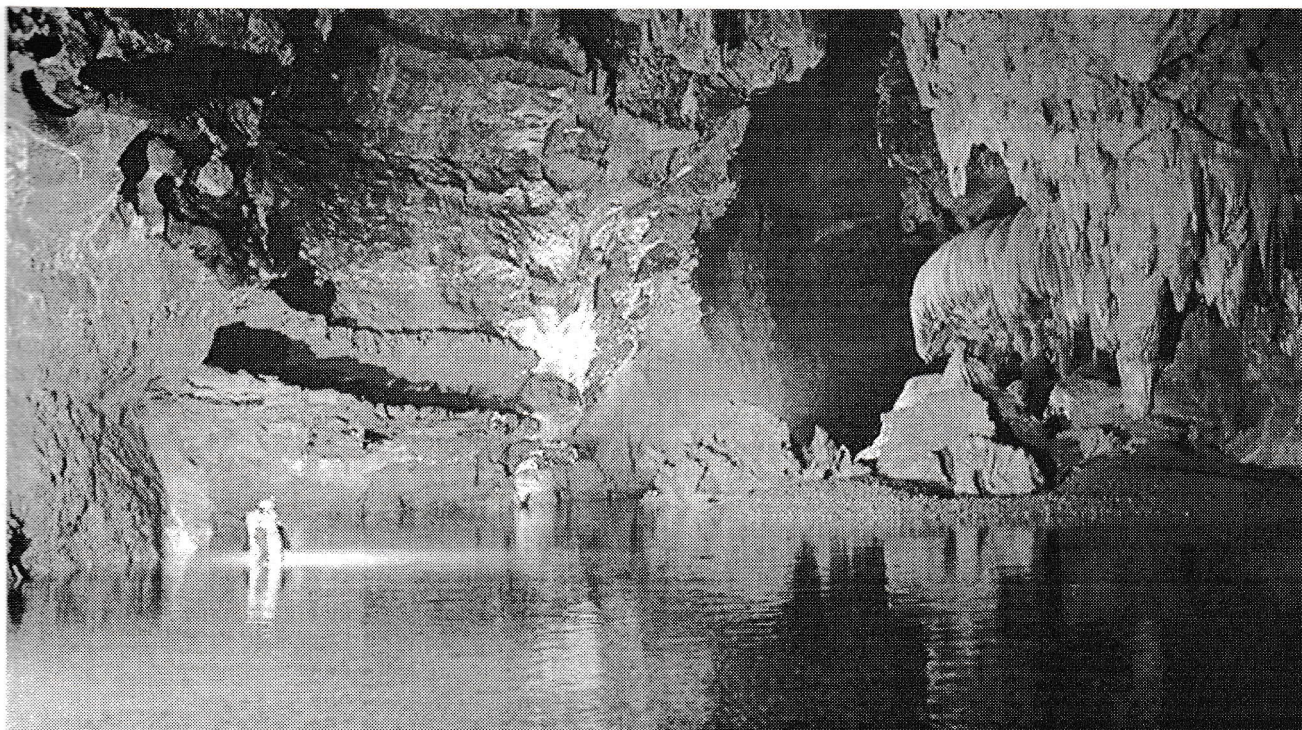
the night. Now that we were through the sump, we were kind of committed and should the water levels rise, we had a fairly safe place to wait (during the last expedition two cavers were trapped for 57 hours in this cave). All the gear had survived, the cameras were dry, the sleeping gear was dry, the food was excellent and spirits were high.

We slept well and after breakfast we packed our gear. We didn't know where we were going to camp for the next night and we hoped that we would find a dry area beyond WYSIWYG. We split into two groups, Mick, Deb and Martin pushed on from WYISWYG, and the rest of us did a couple of hours of big river passage photography before checking out the inlets and passages marked as questions on the survey. Huge big leads often became massive alcoves (one lead named the 1000-Yard Stare turned out to be a big bend) and Miss Piggy's Corner proved very disappointing. Nonetheless,

Mendip Head went and became a rout as three fit cavers tried to sprint to the end of a Nullarbor-sized phreatic passage.

When we got to WYSIWYG we picked up the survey and started swimming again. After a while we caught up to where the others had left a note, plum in the middle of the best underground campsite I had ever seen (Camp 3: The Good, The Bad and the Vodka ... yes we had vodka). We dumped our gear and went out check out the obvious high-level inlet to our right. Disobedience Passage turned out to be high level and stunning, it was big, spectacular, sandy and with huge pristine gours, unfortunately it ended at a huge pitch with the river below as we had looped back to over the main passage. We set off back to camp to get organised and have tea ready for when the first team returned.

The others returned with stories of



Hang Khe Rhy River Passage, Quang Binh Province © Vietnam '99

swims, swims and more swims ... and then daylight, and jungle. We were disappointed that there wasn't any more of the Khe Rhy river cave, but there were many questions: where had the cave come out in the jungle, what was in the valley, and where did the river go? So John, Snab, Hiêu and I set off to check it out. Khe Rhy river cave was spectacular all the way and we quickly traversed the 1.9km to daylight. The exit of the cave was some 40m wide by 80m high and we soon found ourselves in a veritable lost world. We were in an enclosed valley with sheer cliffs around us and a huge river joined us from our right. Going upstream was very exciting as we could see that a river was coming from a massive cave (80m wide by 80m high). We thought that we had found a mega system; but we had rediscovered Hang En, a cave recorded by the 1992 Caving Expedition. We did not follow the river downstream to the other side of the doline as it was getting very close to our turn-around time and thunder echoed around the valley, it also started to rain. This was the first rain after the dry season.

We re-entered Hang Khe Rhy with a small element of panic and essentially we legged it to Camp 3, picked up our gear and kept going to where we met the others at Camp 2 just before Sump or Glory. The others had picked up a leisurely couple of kilometres of new side passages and were in high spirits. We rested, and I for one had a fitful

night, waking whenever the river sounded different. The next morning we could see that the river had been up and down by 0.2m, and thankfully, the sump was still open. We set off to meet our porters and guide at the upstream entrance. Without doubt, this cave has to be one of the top 10 'classic through trips' of the world and it sticks in my mind as one of the best caving trips that I have ever done. After four solid days we had pushed the system to 18km.

In the remaining weeks of the expedition not much more was found in the Son Trach region, but a great deal of valuable work was carried out with the researchers from Hanoi University and a few potential leads were found. It looks as if this area will keep its secrets for a few more years yet.

Postscript: The team returned to Hang Khe Rhy in the last week of the

expedition to push Raining Flies and finally closed all the major leads and the survey at 18,902m. We think that this river cave can claim the record for worlds longest continuously traversable river cave (without the need for breathing apparatus): 11,752m from Foot and Mouth to Huda Thought It. The full account of the expedition will appear in the Expedition Report, which is to be published in the UK in the near future.

The Team

Poms: Howard Limbert (expedition leader), Deb Limbert, Martin Holroyd, Pete O'Neill, Simon Davis, Mick Nunwick, Peter McNab, Annette Becher, Paul Ibberson, Fiona Mackay, Colin Limbert.

Ex-Pats (Oz): John Palmer, Geraldine Palmer, Steve Milner.

Vietnam: Nguyen Hiêu, Vu Van Phai, Nguyen Quang My, Phan Duy Nga, Nguyen Xuan Truong.

Acknowledgments

My personal thanks go to all my friends in the UK who made this trip possible, and to all my new friends in Vietnam who opened the doors to made our expedition the fantastic success that it was. Thanks also to David Martin (NSW) who supplied waterproof survey paper and also to Anchor Wetsuits (Tasmania). Finally, my heartfelt thanks go to my wife Fran and my daughter Siân for all their support.



The Team on a 6x6 Chinese Jeep, © Vietnam '99

Ape Cave

Steve Bunton

It's the little surprises that often make for life's highlights. Certainly this was my experience from a recent tour of the USA. Our trip was a family holiday, take the daughter to Disneyland, visit a few friends, see the sights and possibly bag a few peaks -sort of affair. Mountaineering is so much easier to organize than caving; it takes less gear but most importantly mountains appear on maps! You are therefore spared the hassle of finding

someone to help you find the cave. Occasionally you can be lucky and find a cave on your own and explore it.

So it was that we discovered Ape Cave, the longest lava tube in the continental USA at 12,810 feet. It is on the southern slopes of Mt St Helens (which was one peak on the hit list). So looking for other interesting things to do we explored Ape Cave and found it to be like all other lava caves I'd

visited; round, black, mostly straight and almost devoid of formations. The US National Parks were quite happy for you to explore the cave as a self-guided tour since the cave is already "hardened" and there is not a lot of damage you can do. You can even hire a propane camping-style lantern for \$2, which was about the best value anything we scored in the US.

In the same region was the Trail of Two Forests which was amazing. This area has a boardwalk through a revegetated lava flow some 4,000 year old. Contained in the flow are tree moulds where lava has solidified around large pinetrees and the trees have burnt away to nothing. As you wander along, the forest floor is perforated with "trash can" sized cylindrical holes. The best bit though is another self guided caving tour. At one point there is a mould of a vertical tree which had a semi-horizontal fallen log adjacent to it. You can descend the vertical pothole about 3m on a steel ladder then squeeze through the point where the log touched the tree and return to the surface up the gently inclined mould of the log. Amazing!

It was a bit hard on the knees, even the texture of the pine bark was perfectly preserved and like all lava caves it was round and black. You definitely need a torch even though it's not a world beater at an approximate length of only 15m. Considering that some of the caves I've surveyed in Australia are only rubbish bin sized anyway, I thought this cave was fantastic.



Grace Bunton descending into a tree mould, Trail of Two Forests, Mt St Helens National Park, Washington, USA.

Accident Report

Middle Earth cave, Takaka Hill, South Island New Zealand. 19th-20th January 1999

Glen Robinson and Matthew Hole

Aims:

1. Inform the speleological community affiliated with the ASF of a caving accident.
2. Identify and discuss factors contributing to the accident.
3. Suggest future measures to reduce and eliminate similar incidents

Participants - (alphabetical) Ken Anderson (MUCG), Angie Bishop (SUSS), Mirriam Fokker (NUCC), Marcus Frith (NZ SAR), Matthew Hole (SUSS), Tim Moulds (MUCG), Jason Moule (HCG), Liz Petersen (MUCG), Glen Robinson (HSC), Antony Sprigg (MUCG), Matilda Thomas (MUCG). (Greg Holmes and Agnieszka Hornung remained at the hut)

Location: Middle Earth cave, Takaka Hill, South Island New Zealand.

The emphasis of this report is the communication of several important lessons learnt from the incident. As such, the accident report is brief and concise, without intending to be complete. A more detailed report is available from Matthew Hole, (email) matthew@ee.usyd.edu.au. In the authors opinion, it is far more important for readers to absorb the analysis than plough through a blow-by-blow description. The account is written in the present tense.

At ~10am on Tuesday 19th January 1999, a party of 5 people, comprising Matthew, Antony, Liz, Miriam and Matilda are dropped off at the entrance to Middle-Earth Cave. Their entry is staggered, and their movements about the cave are disjoint (ie. they do not move as one group). At around 1pm Matilda communicates her desire to leave to others, and exits the cave. On her way up the entrance pitch (35m) the rope collects on her pack, which is hanging below her. When she dislodges the rope it becomes tangled and subsequently catches on a ledge about 17m up the pitch. At around 3pm Liz and Antony return to the base of the pitch. Discovering the rope not there, they don garbage bags (for warmth) and yell Matilda's name. Two hours later Matthew and Miriam arrive

Matthew makes a brief assessment of the situation. The scheduled panic time is not till 6am and the party (in his

assessment) does not have adequate warm clothing or survival gear. Matthew analyses the wall for handholds, and deduces that (a) the climb is at the limit of safety, (b) he does not have the appropriate gear to guarantee his safety. Nevertheless, Matthew dons his SRT gear and arms himself with a number of slings. Miriam agrees to belay Matthew on 9mm static rope. On his way up, Matthew places two slings (to act as runners), one on a large bollard at 4m up, the second on a thin rock projection at 7m up. Nothing else is available. Matthew proceeds to climb a wet flowstone wall with virtually no handholds. He falls.

Matthew is unconscious for about one minute, and mildly concussed for up to 20 mins. He is informed that he fell, and the top piece of protection failed. Although the first piece of protection held (and prevented more certain injury), Matthew landed on the ground. During the next 12 hours Matthew experiences a combination of hypothermia, shock and extreme pain. The others attempt to keep him warm with a combination of space blankets, body heat and carbide generators. Although under a dripping wall, and having landed on a floor with sharp rock projections, Matthew is very tired, and does not want to move.

At 8:30am the next morning Jason and Ken enter the cave. They negotiate the rockpile (about 2 mins), and descend the entrance pitch to reach the party. By now Matthew is very weak and cold. The rest of the party is suffering mild hypothermia. Jason and Ken administer basic first aid, supplying sleeping bags and glucose sweets. Glenn descends the pitch, assess the victim, issues a set of instructions concerning patient care and ascends the pitch. Glenn sets up a 2:1 mechanical hauling system with brake and reversal components. Ken ascends the pitch in tandem with Matthew's ascent. Helpers assist Matthew through the rockpile. At the final 5m climb a hauling system is established to extricate Matthew from the cave.

On the surface, a member of the New Zealand Cave Search and Rescue Squad (Marcus Frith) is on site. He had been called by some NZ cavers who had read the intentions board at Takaka Hut, and noted that a

party was way overdue. Marcus Frith had called an ambulance. About an hour following Matthew's rescue, the ambulance arrives. Matthew is strapped to a spine board and transported to the road (50m away). The ambulance is local to Takaka, and a transfer to a Nelson Hospital ambulance is conducted about 10km from the site of injury, at Ngarau Tourist Cave parking area. Matthew is admitted to Nelson hospital at ~5pm.

In Nelson Matthew is diagnosed with a fractured left distal radius (treated by surgery on 20/1/99), cracked ribs, a transverse process fracture of a lumbar vertebrae, comminuted fractured left scapula (treated by collar and cuff), chest contusion (treated by antibiotics and physiotherapy), median nerve praxia and frank haematuria. He is discharged after one week, and flies home.

In Australia, becomes concerned that the sensation is not returning in his left hand. He is admitted to Royal North shore Hospital and undergoes median nerve exploratory surgery on 11/2/99. Surgeons discover about 20% damage to the median nerve, and treat the injury with a nerve graft and carpal tunnel release.

In time, Matthew is expected to make a full recovery.

Analysis

The analysis is divided into four sections; General Factors, Specific Factors, Summary and Conclusion. Italicised comments represent suggestions for the safe conduct of any large trip or expedition. Unitalicised writing pertains to analysis of this particular incident. It is emphasised that whilst the authors have sought the opinion of many of those involved, and have drawn upon input from others uninvolved in the incident, the analysis remains the work of the authors.

General Factors

1. Trip organisation

Particularly when there exists a broad range of skills and experience across the group, it is vital to appoint a trip leader for each caving party, and ideally, a trip leader for the whole trip. For each caving party, the appointed trip leader should make all binding decisions relating organisation, safety,

Accident Report

and participant selection. This person should also be skilled in all aspects of caving, delegation and communication

The trip was organised by four people. From the outset, the trip had been planned as an experienced expedition to the Ellis, with a side trip to Takaka. At the time of conception the organisers felt that there was no need to either appoint a single trip leader, or to identify individuals to lead caving parties. In retrospect, this was a mistake. Over time, and due in part to a misunderstanding between the organisers, the aims of the trip evolved into something quite different from its beginnings. Ultimately, the trip was far from the experienced expedition that was initially planned; the reality comprised a wide range of caving ability and experience. Unfortunately, the organisation of the trip did not adapt to the changing circumstances. In addition, the collective group outlook did not downgrade from an expedition mentality, until too late.

2. Communication

Every person on the trip should volunteer any safety concerns they may have. Every person on the trip must be prepared to accept constructive criticism with regards safety matters, on a non-personal level

Some may argue that this is obvious and redundant. However, social dynamics can be an extremely complex issue. Unless an open and non-personal mindset is adopted by all concerned, discussion of safety aspects can easily result in misunderstandings. Worse, participants may not feel comfortable raising safety concerns. On the trip in question, it would be fair to say that freedom to discourse matters of safety was not accentuated sufficiently; either on the training exercises or at the commencement of the trip.

3. Participant Selection

The aims of the trip and requirements of those attending should be made absolutely clear before the final list of participants is formulated.

This is most important as far as ensuring those who attend are competent in skills required to perform the tasks planned. Where necessary, the trip leader may choose to implement steps to improve an intending participants skill level

Given that the trip attracted parties from many different caving clubs, and that no one person was appointed Safety Convenor/Trip Leader; it is therefore not surprising that the final list of participants exhibited a wide

range of skills, experience and abilities

4. Training

Particularly on expeditions, it is advantageous if every member of the group feels comfortable caving with others on the trip. This can be accomplished by pre-expedition training trips which involve everyone.

Training trips also have the following advantages,

1. Participants have the opportunity to learn each others abilities and limitations.
2. Participants learn to function as a group.
3. Problems are identified on training trips and can be rectified before the trip

On this trip, one training trip was held. Whilst concerns were raised, insufficient measures were implemented to rectify these problems.

Specific Factors

1. Integrity of the rope.

It is the responsibility of each SRT caver to ensure the integrity of the pitch is preserved. That is, the rope spans the full length of the pitch, remains untangled and intact, is anchored securely and is rigged in such a way so as to minimise wear on the rope. It is the responsibility of those training cavers in SRT to instruct them on the importance of the integrity of the rope.

In this instance several factors contributed towards the end result of a tangled and snagged rope. Firstly, the pitch was rigged in such a way that it layed on the wall for the last 18m of the pitch. A redirection was in place, but was mostly ineffective. In retrospect more time could have been taken to ensure the rope was free-hung for the entire length of the pitch. Secondly, it is clear that the exiting caver was not fully aware of the movements of the rope below her, nor the dangers that a tangled rope would face to the party below. It is imperative that when cavers are SRT trained they be made aware of the importance of integrity of the rope.

2. Party dynamics.

Frequently one member of a party may wish to exit the cave. Especially when the experience of the caver is low, or the caver is fatigued or ill it is essential that the caver be escorted from the cave

In this instance the caver was only a short distance from the entrance, was relatively inexperienced and had

informed the party that she was feeling a little ill and tired. As such, the decision of the caver concerned to exit should have been questioned by the person to whom that information was communicated. It is the responsibility of everyone in the party to look after the safety interests of others

3. Climbing.

Where a climber is skilled and the appropriate climbing apparatus is available, the decision to make a climb is best made by that person. However, when the skill of the climber is unknown, or the required climbing gear (to perform the climb safely) is unavailable, the decision to climb should be made by all those present.

In this instance the difficulty lies in the fact that the prospect of climbing was at worst dangerous, and at best at the limits of safety. Secondly, the appropriate equipment to safely conduct the climb was not available. In this case the decision should have been made by all those present; as everyone was going to be affected by a long wait under inhospitable conditions

Summary:

The accident resulted from several factors. Firstly the caver exiting from the cave should not have done so alone. The trip was primarily for pleasure. It is only a minor inconvenience for the party to take a little extra time and ensure that inexperienced cavers don't cave alone. Secondly, the exiting caver should have had more training. Indeed, a more comprehensive pre trip training schedule should have been implemented for the whole party. Finally, and in retrospect, the victim should have waited - rather than attempt a difficult climb. It is feasible that in other circumstances the climb may have resulted in rope retrieval. However, it did not. The decision to climb may well have been wise if adequate protection was present; but a near vertical wet wall with little protection is not a wise option. Most importantly, the decision to climb should have been made by the entire party.

When in doubt, it is easier to choose the site to wait, rather than being forced to wait in an inhospitable position; in pain, and compromising the remainder of the party. Help may have come quicker than anticipated

The victim was fortunate his colleagues had first aid knowledge

Trip leaders must think of the well being of all in the party, including

themselves

In theory, had the standard code of safety been adhered to the accident would have been prevented. In reality, expedition rules of safety in deep and wet caves cannot be strictly adhered to, some compromise must be made.

Conclusions:

(I) ONE trip leader should be appointed for each caving party.

(II) When there exists a wide range of skills across a group, ONE

trip leader should be appointed for the entire trip.

(III) It is the responsibility of all clubs to ensure that when a person is admitted to membership, they are conversant with ASF code of ethics and safety. These must be reinforced from time to time.

(IV) Unfamiliar and inexperienced cavers should be subject to a pre trip training schedule.

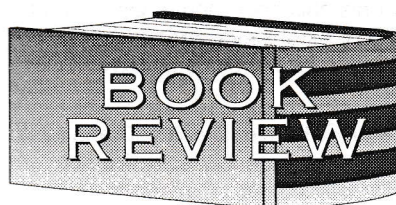
(V) Those training SRT must stress the importance of assuring the

integrity of the rope.

(VI) If an action is proposed which involves significant risk to a person or persons; discussion with the whole party MUST be conducted, to identify both the risks and the consequences.

(VII) All party members on such trips should be first aid competent

(VIII) The rescue resulted in an effective and uncomplicated extraction of the victim from the cave.



A New Look at the Development-Conservation Nexus

A review by Elery Hamilton-Smith of Vermeulen, Jaap and Whitten, Tony 1999. *Biodiversity and Cultural Property in the Management of Limestone Resources*. Directions in Development series, The World Bank, Washington. x + 120pp.

This publication is available from the World Bank for \$US 22.00 plus packing and postage. See the Web-page www.worldbank.org (click on publications), or order from <books@worldbank.org> or fax your order (pay by credit card) to 0015.1.703.661.1501.

Cement plays a vital part in the development of modern infrastructural and urban construction. At this point in time, there is no feasible alternative. Inevitably, the quarrying of limestone for cement manufacture (and other purposes) will conflict with land conservation to at least some extent. This publication represents a major step forward in re-consideration of the basis upon which quarrying is to be planned, and although directed specifically to East Asian countries, it introduces principles of world-wide relevance.

It grows out of a consultative process established by the World

Bank, and implemented in partnership with the International Union for the Conservation of Nature. A number of scientists were involved in preparing drafts from which the final report might be compiled, in discussions of the issues at a meeting held during January and/or in reviewing and commenting upon draft documents. Importantly, they were joined by representatives of major cement companies who also provided very positive input to and support for the project.

A review of previous environmental assessments in the region demonstrated that the distinctive character of karst, particularly in relation to biodiversity and cultural values has not been considered. Only one referred to aesthetic and wilderness values. Currently developing World Bank policies now address this problem, and support . . . protection, maintenance and rehabilitation of natural habitats and their functions . . . and expects borrowers to apply a precautionary approach to natural resource management . . .

Much of the volume is devoted to a state-of-art summary of knowledge about karst processes and landforms, the distinctive biodiversity of karst areas and the other values of karst. One of the most interesting chapters in this section details the non-quarrying economic benefits of karst, which in tropical regions may be considerable. Many of these relate to the diverse economic benefits provided by an intact eco-system, but tourism may also be of great value and benefit.

The ways in which quarrying has negative consequences are described at length and include dust deposition, impacts of blasting, partial or total destruction, fire, disruption of

groundwater movements, siltation or chemical pollution of the aquifer, environmental damage as a result of worker migration onto the karst area, including hunting and collecting. The vulnerability of karst is the subject of a further chapter.

Finally, a series of proposals are presented dealing with impact assessment practices, site selection, the role of the Clean Development Mechanism under the Kyoto protocol, mitigation of impacts, and rehabilitation and reconstruction of sites. One can only say that if the practices advocated here had been observed in Australia, both the cement companies and the conservation movement would almost certainly have been spared both considerable environmental damage and some extremely costly conflict over the past 30 years. One can only hope for better standards of practice in the future.

Perhaps one of the important conclusions is that the cement industry is definitely one where "bigger is better". Only a large and professionally managed company has the necessary capital to properly carry out the essential investigation and planning before commencing operation, to operate with proper dust suppression and pollution control, and to ensure satisfactory restoration on the decommissioning of any quarry site.

This is an extremely timely publication, and one that deserves to be very widely read by those concerned with and involved in both the management of limestone-based industries and land conservation.

Elery Hamilton-Smith is chair of the IUCN Working Party on the Protection of Caves and Karst.

Obituaries

Glenn Hunt

Dr Glenn Hunt died in September 1999 at the age of 55. Nearly 150 people from all walks of life attended his funeral.

Glenn's first caving trips were to Borenore, near his childhood home at Orange. He joined SUSS in 1962, taking part in the Wee Jasper freshers trip. This legendary trip, in which 70 or so wended their way to Wee Jasper in a hired bus owned by the father of a later SUSS member, was the first for a generation of cavers who resuscitated SUSS in the mid-1960s. By 1963 he was Treasurer of SUSS and in 1967 became Assistant Secretary of ASF. A few years later, as a member of the Speleological Research Council, he worked behind the scenes to help Helictite survive and prosper as a visible symbol of Australian speleology.

He was a keen participant and organiser in several SUSS and CEGSA Nullarbor Expeditions between 1963 and 1966, including being a 7-day underground camper on the CEGSA Expedition in January 1966. The SUSS Newsletter for November 1966 (Vol 6, no. 8) ran a delightful report by

Glenn on the vicissitudes of even reaching the Nullarbor in those days before sealed roads and reliable cars. Mullamullang Cave provided a real intellectual challenge and he wrote a much-referenced paper on its origin for Helictite.

In May 1964, Glenn started to appear on caving trips with a harem of young freshers. The harem was a great help to Glenn in collecting bugs and helping around the camp fire. One was to become his life-long companion, Frances Moore, who he married in 1968. Some years later they inherited that wonderful old waterfront house next to the Parriwi Lighthouse in Mosman, the inspiring harbour view from which will be remembered by many cavers.

No doubt nostalgic for his childhood home, Glenn made several explorations of obscure cave areas in central western NSW seldom visited before or since by cavers: Cow Flat, Naroogal Park, Bakers

Swamp, Stuart Town, Newbrigyn Creek. Glenn also discovered an extension to Fig Tree Cave at Wombeyan which to this day remains something of an enigma. We have a map, but exactly where is it?

After graduation Glenn taught high school science for a short time before becoming an Education Officer with the Australian Museum where he worked for the rest of his life. In the 1970s he began a lengthy candidature for his MSc, but as the years passed his supervisors became restless. Under pressure he eventually produced a thesis considered so outstanding by the examiners that the University of Sydney awarded him a PhD. In time he became a recognised world authority on Harvestmen and certain mites.

Glenn was a prominent member of the Confused Elderly, a group who had become friends in SUSS in the late 1960s, some from that legendary 1962 bus trip and including all but one of the 1967 Committee. The core group of old SUSS members and their growing families holidayed at least once a year for 30 years, often at Greenpatch on Jervis Bay, with occasional more energetic expeditions further afield. A trip with the children even paid a visit to B31, where Glenn had spent past years in many hours of digging and lugging gear.

His last caving trip was at Jenolan in 1998, during the 50th birthday celebrations for SUSS.

So, how do we remember and celebrate people like Glenn? Yes, there were the



Glenn Hunt collecting insects

shared achievements, on the Nullarbor, at Jenolan and Cliefden. Then again, Glenn was never the most kempt in appearance: that and his delightful idiosyncrasies belied his focused and ordered mind and dry wit, endearing him to all. No longer will we hear of the "situation being ameliorated".

With his passing we are, "indubitably", much the poorer. "Quite so"

John Dunkley & Bill Crowle

David Jackson

1971-1998

One of the Sydney University Speleological Society's most active current members, David Jackson, died suddenly in Denmark in August 1998.

David was a member of SUSS from 1994. His services to the Society's administration include two years of close tending of the Society library, and a year as President during which he encouraged extensive co-operation with other societies. He participated in extended Society trips to Tasmania, New Zealand and Seram in Indonesia; and made numerous discoveries, mostly around Jenolan.

David was a gifted man, talented in singing, a lover of music, a University medallist in mathematics and an Australian representative at the International Physics Olympiad. However, the David whom we in SUSS remember the most is the cheerful soul with the effervescent good humour who accompanied and assisted us over many an obstacle and through many a tight place.

Caving became a vitally important ingredient in David's life. The puzzles and challenges posed by the underground world fascinated him. He would enthusiastically research each conundrum, pore over journals and books, then be off

to dig to test his latest theory, sweeping us along in his wake. David's enthusiasm saw many of us caught up in his relentless pursuit of the uncharted reaches of caves. It is by David that we have been dragged for dozens of hours on end on countless trips through North Tunnel, to dig in Twiddly-Om-Pom, to swim in Silly Buggers Sump, to grovel in Ice Age. On a lazy Sunday, it was often David who would gird us into action with his freshly brewed coffee and the exhortation that "The survey HAS to be finished!".

This enthusiasm, however, never detracted from his patience. Many a novice caver spent hours at his side as he inducted them into the mystique of speleology. He would not tire of such tasks, as he would experience their joy and wonderment at discovering this new world as if it were he who was the neophyte.

There have been few in SUSS who have matched David's drive and determination while maintaining amiability and good humour throughout. As we pass through those little bits of cave that he has left us, as we read back over his careful documentation, as we think of his cheerful smile and laugh, as we feel the warm eternal radiance of his presence and companionship, we will remember David fondly.

A scholarship in mathematics at the University of Sydney has been set up in David's honour. To make a tax deductible donation to the David Jackson Memorial Prize in Mathematics, contact Flora Armaghanian on (02) 9351 4533

Chris Norton



David Jackson in the Tuglow streamway - photo David Connard

