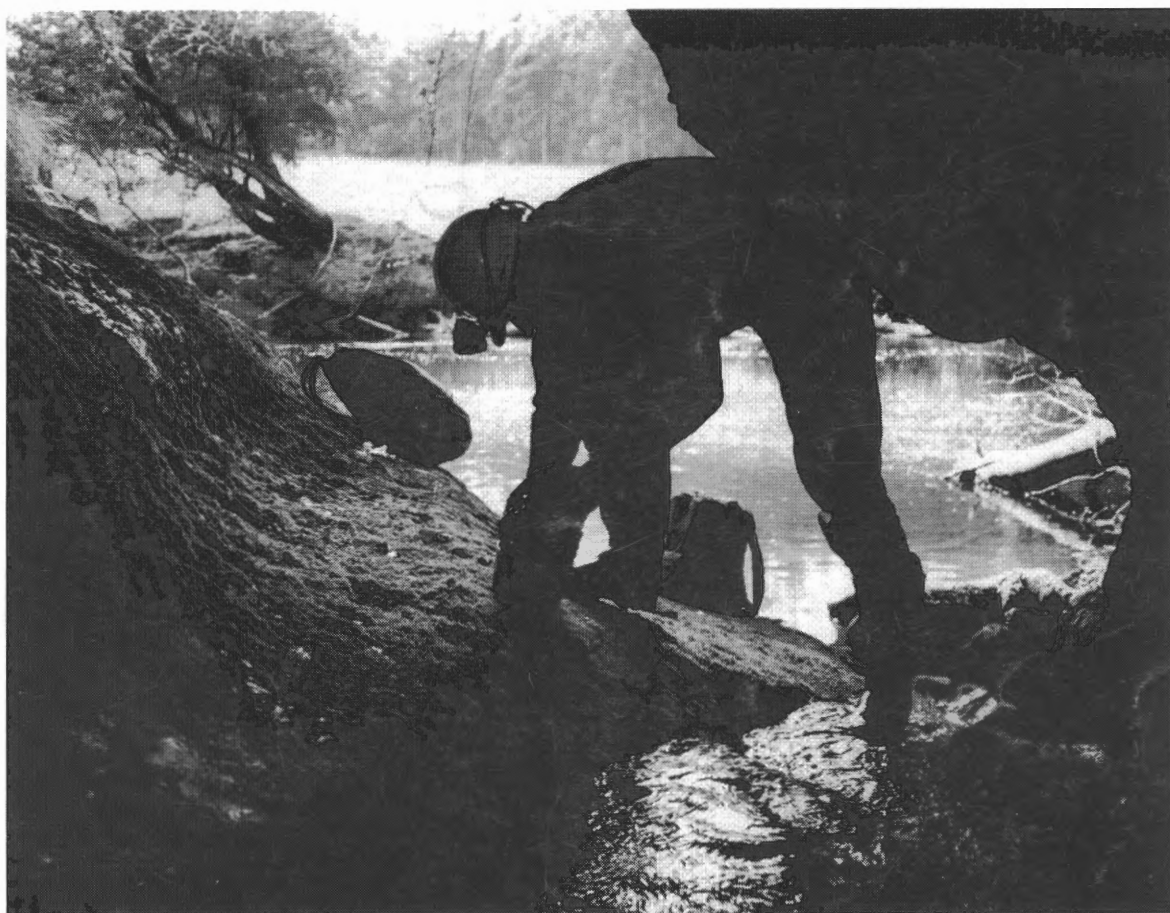




Australian Caver

The Quarterly Journal of the
**AUSTRALIAN SPELEOLOGICAL
FEDERATION INCORPORATED**
PO Box 388, Broadway, NSW 2007

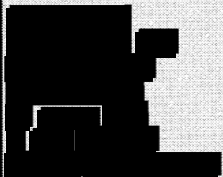
Issue No. 141, June 1997



*Looking out the efflux entrance of Swallowsnets cave (L-005) Loongana, Northern Tasmania.
Winston Ponder in search of some Hydrobiid Gastropods (small aquatic snails)
Photo by Arthur Clark - 1997*

**Who to blame
when things go
wrong...**

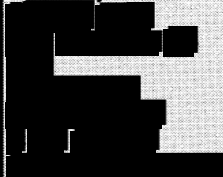
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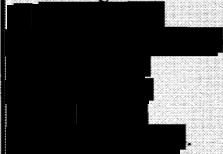
Executive Secretary:-
Phillip Lardner
14 Crystal Place



Membership Secretary:
Angus Macoun
37 Chelmsford Avenue



Editor:-
Dean Morgan



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Editorial



Well - I'm back to being "Mr Happy" again readers! I had a huge response to my moaning editorial last issue, and it's made me realise that the majority of readers are *not* the whining hypocritical toadies I portrayed you all to be in the last issue. It's just a couple of you! A huge thank you to all of the individuals, clubs & organisations who made the effort to contact me with words and letters of encouragement - it was very much appreciated, and I won't forget who you are!

Now - you may be wondering why there is a photo of me holding a bunch of flowers at the top of the page! That's just to show you readers what a wonderful sensitive new age guy you have here as your editor...

What!?!?!? You don't believe me? All right then, I'll tell the truth... Kelly Miller took the photo, and then forced me to publish it. She obviously didn't give a toss about the long-term effect it could have on my image. Don't worry Kelly, I won't forget this one...

What's been happening with the ASF then? All positive things I feel! The Quorn ASF conference came and went, and all the people I've spoken to who attended were impressed with the conference and the outcomes. By the way, the newly elected ASF executive are printed on the header of this issue, so lets all get in there and give them our support too.

The new ASF executive also held a teleconference in April, and I asked to be involved with the "Australian Caver" aspect of that discussion. I can only say that I think the ASF is on it's way up again! The entire executive seemed keen and positive, and it was all very productive discussion that took place. I get the impression that the *real* ASF is far cry from the ASF portrayed on the ozcavers e-mail discussion list, where people only bother to contribute if they have something negative to say about ASF. (See Jill Rowlings comments somewhere in this issue about that too...)

As for what's happening with the Australian Caver; the ASF have funds available for one more (September?) Issue for this year, but, if you look at the budget presented on page 5 of this issue, you will see the figure of 4 x \$2000 for the 4 issues per year. It cost me \$3000 to produce one issue, and I have no way of doing it any cheaper, so it looks like you will be getting less issues next year - or at least smaller ones. This is in no way a swipe at the ASF, it's just a financial fact of life. So keep it in mind the next time the issue of ASF fee rises comes up. The ASF can only be what you members put into it!

Now, following on from the issue of what members can put into the ASF,

I have got to say a "thank you" to three ASF members in particular; Steve Brooks, Peter Ackroyd, and Garry K Smith.

Steve Brooks has had the thankless job of providing the mailing list for me. (*I really felt sorry for you Steve. Maintaining the mailing list would have to be the most thankless task in the ASF!*). Thanks immensely for putting up with it Steve.

Garry K Smith has provided me, and continues to provide me, with an endless supply of articles and contributions for publication. Thanks very much Garry, and please - keep it up!

And last, but certainly not least - Peter Ackroyd. Certainly for his articles and photos, but also for his editorial advice, guidance, and comments whenever I asked him. Thank you very much Peter.

Without the assistance of those three people in particular, you would not have seen these last three issues, it's as simple as that. Thanks again fellas!

On a final note... I've also had numerous members asking me to publish a contact lists of all the ASF affiliated clubs in an issue of Australian Caver. I have taken it on, I promise to fit them in as soon as space permits, and please, if there's something you would like to see in issue of Australian Caver, let me know!

That's all I've got to say for this issue. Please keep those contributions coming in, and I'll catch you all next issue!

Dean Morgan
Your sensitive new age editor!

Letters to the Editor Part 1...

The Editor
Australian Caver

Dear Ed.

I wish to draw your attention to a serious defect in your photo of the TCC appearing on page 18 of Australian Caver, issue 139. The defect, or rather, defector, is in the back row, right hand side, with a white helmet and beard. It used to be a Queensland - even CQSS member, and our No. 1 Mt Etna protestor. Sadly, it defected to that island at the bottom of Australia and we never hear from him.

Being an "armless cripple", maybe his condition has deteriorated and he has lost the ability to write and lift phone receivers?

Disappointed
Peter Berrill
President
CQSS

Letters to the Editor Part 2...

The Editor
Australian Caver.

RE: Cave Diving Standards

Dear Editor

As a Director of one of the most active Cave Diver training agencies in Australia, I would like to update your Cave Diving Standards as published in Australian Caver No. 140, March 1997.

Technical Diving International is the worlds largest, and fastest growing, technical diver-training agency. In Australia, our Overhead and Sump courses were designed by Rob Palmer from the UK. We have been successfully running these courses since TDI's inception in Australia in early 1995. We are continuing to build on our course structure, and this year, we will release a worldwide Cave Diver certification.

Upon reading the published ASF Cave Diving Standards I was surprised to see the CDAA & IANTD listed, but not TDI. I have contacted Ron Allum to discuss this, and he has agreed that the TDI should be included. Therefore, I ask that you publish an addendum in the next journal advising all members that the TDI is an accepted Cave Diver Training agency.

Yours Sincerely
Richard Taylor

*Editors note:- What is the usual procedure here? Who does what to make the amendment?
Can someone please let me know!*

*"If you were driving along at the speed of light in your car, and you turned your headlights on - What happens???.
-- Anonymous*

Letters to the Editor Part 3...

[Editors note:- I didn't plan on publishing any of the letters to the Editor about last issues editorial of mine, but this one impressed me so much I felt I had too!!! It even had that "human touch" - meaning that it was done on a typewriter, and all the spelling corrections had been done with a blue pen! Gad - I wish I could give out a "letter to the Editor" prize for this one I was so impressed! (Although one I received from Lucinda Coates came in as a close second, suggesting I have "Dear Dean" column in the Australian Caver- where I can be as sarcastic as I like in regard to personal comments, and become famous like John Laws!!!)

An open letter to some of my caving cohorts around the country.

Ahem,

For crying out *@&#!+?@ Loud Guys!!!

Honestly, just where do you'se get off?? The mans been in the job five minutes, and already your hounding him into early resignation. Look; if ya think your current Editor is crook, just keep up the pedantics for perhaps one more issue and he'll tell you where to shove it - no one else will do it, and I'll volunteer. And then you'll **really** have something to bitch about!!!

I thought Dean was doing a fantastic job, but then I guess I wouldn't know - not being connected to one of them calculator thingo's, or on the yabbynet. But really fella's, in hindsight, don't you think it might have been a bit rich bagging the poor bugger while still new in the job? Don't you want a newsletter?

Look; it's like this: if you nit-pickin' bastards cost me the enjoyment of receiving the "Aussie Caver" in my mailbox each quarter; I'll come looking for ya! I'll go to every damn conference, every damn N.S.W. Speleo Council meeting, the Jenolan Trust's meeting, I might even go to a V.S.A. meeting, but I'll find ya! And god, I can be precious when riled...

Kerry Hamilton
Canberra.

Letters to the Editor Part 4...

The Editor, Australian Caver
Mr Dean Morgan

In Sherry Mayo's article in Australian Caver Issue 140, she makes reference to a difficult change over; *"this rigging is awkward - it isn't for novices"* at the entrance to the new Drum cave extension. This is indeed difficult as the rebelay forms a Y hang of around 110 degrees, making a straight change over of ascenders very strenuous. Another approach is to prussik up the (*main*) rope to the top of the rebelay, attach your descender to the (*main*) rope, and lock it off. Then remove your ascenders and place them above the rebelay, unlock the descender and lower off until the ascenders take the weight and the descender can be removed, and continue prussiking. With practice, this is just as quick as a straight swapping of ascenders (*assuming you have the strength to do this in the first*). It is also safer, and requires no additional energy outlay beyond a normal prussik.

A big thanks to Sherry for bringing caving back onto the pages of Australian Caver! Well done, and the only criticism was the lack of appropriate photo credits for the article.

David Gwillim

*If you were capable of cloning your own body, and you were caught having sex with your clone,
Would that be called incest - or masturbation?*

ASF Budget for 1998

1998 Membership Year (1 Jan - 31Dec)

Income

members	single	450	@	\$25.00	\$11,250.00
	Family	140	@	\$40.00	\$5,600.00
	Student	120	@	\$17.50	\$2,100.00
Associate Organisation		9	@	\$35.00	\$315.00
Individual Members		10	@	\$35.00	\$350.00
					<u>\$19,615.00</u>

Expenditur

Executive

Directors		\$	900.00
Fees			
Meetings	2 x \$750	\$	1,500.00
Teleconference	2 x \$250	\$	500.00

Council

Meeting expenses	\$	100.00
Distribution	\$	100.00
Printing minutes	\$	100.00

Operating Expenditure

Postage	\$	100.00
Stationary	\$	100.00
Membership card	\$	600.00
Legal & Auditing	\$	500.00

Commissions \$ 2,115.00

Communications

Australian Caver	4 x \$2000	\$	8,000.00
Pamphlet		\$	500.00

Insurance

\$ 4,200.00
\$ 19,315.00

Surplus/Deficit \$300.00

Just publishing the budget for next year early, so that the clubs can plan for the cost of the ASF fees well in advance!

Chris Riley - ASF Treasurer

ASF Mailing list changes - please read!!!

At the April ASF Executive teleconference, it was decided that from now on, the ASF treasurer would be the *one and only person* maintaining the ASF's mailing/contact list. Previously, the ASF has had it spread around numerous people, but it will now be "streamlined" down to the one person to make things more efficient. The treasurer's address is:-

Chris Riley



Please send *all* up-to-date address lists and alterations directly to Chris, and not via the ASF mailbox, Steve Brooks, or Dean Morgan! If you don't receive your copy of Aus Caver from now on, it either means that you are not financial - or you haven't given Chris your address, so you'll only have yourself to blame! As I write this, I don't know where or how long it will be 'till I can get some mailing labels, or who they're coming from, so if this issue arrives on your doorstep late, you have mailing labels delays to blame for it!

HOT OFF THE PRESS!!!

The International Union for Conservation of Nature operates through a number of commissions, one of which is the World Commission on Protected Areas. They have just released 'Guidelines for Cave and Karst Protection', which was prepared largely by John Watson, Elery Hamilton-Smith, David Gillieson and Kevin Kiernan, but with world-wide input, amounting to over 600 letters, phone calls, papers, e-mail messages, etc.

It is an important document, and will reach many cave and karst managers throughout the world. A limited number of copies are available for general distribution; anyone who wants one should write to Elery Hamilton-Smith, enclosing a donation of \$15.00. This will be used as a small budget for the operating expenses of the Cave and Karst Working Party (*all labor is voluntary*).

Elery Hamilton-Smith,



*Please make cheques payable to Rethink Consulting Pty Ltd
(Separate accounts will be kept for the working party.)*

Thought of the day...

Posted on ozcavers 15/4/97

I'm a little perplexed as to why people say "*the ASF doesn't*" or "*the ASF ought to*" when the ASF is, well, its members. "*What is the ASF doing about...*" should therefore read, "*What will I do about...*" Try that before complaining, that way we can all possibly help to rectify problems before they occur.

Cheers,
Jill Rowlings.

*If you were capable of cloning your own body, and you were caught having sex with your clone,
Would that be called incest - or masturbation?*

Nullabor Track Marking Update

By Rauleigh Webb

During the recent WASG Easter 97 Nullabor trip, route marking was replaced in Sentinal Cave, and a loop of track/route markers in Anzac Cave. Laminated signs were also placed in the caves so that visitors would know what the markers were for, which markers are into the cave, and which are out.

Markers were also placed into Gorange Cave to replace those markers removed from the cave over the last 5 years. Some restoration work was also undertaken. This cave is receiving considerable visitation if the state of the floor is any indication.

It is hoped that cavers can stay on these marked trails and avoid further degradation of these fragile cave systems.

Concours UIS / UIS Wettbewerbe / UIS Inaugral Awards

There are three inaugural awards to be awarded at the 12th International Congress of Speleology in La Caux-de-Fonds, Switzerland, August 1997.

The UIS prize for the most significant discovery May 1993 - May 1997 (USD250)

Nominations for this prize are to be sent to the chair of the UIS Prizes Committee prior to May 1997. Late submissions can be made at the 12th International Congress of Speleology, La Caux-de-Fonds, Switzerland. The UIS Bureau reserves the right to nominate additional discoveries for this prize.

The UIS Prize for the most significant publication on a cave or karst topic published in 1993 - 1997 (inclusive) (USD 250)

Nominations for this prize should be sent to either the chair of the UIS Prizes committee, or to the Secretary General. From the nominations, a short list will be prepared. Copies of the short listed publication may be required for final judgement and display at the 12th international Congress of Speleology, La Cahaux-de-Fonds, Switzerland.

The UIS Poster Prize (USD 250)

This prize for the best poster display at the 12th International Congress of Speleology, La-Chaux-de-Fonds, Switzerland. The poster can be on any cave or karst topic. However, entries in the cave photographic and surveying competitions are ineligible for this prize.

The UIS prizes will be judged by a panel of international experts chaired by the Senior Vice President of UIS, Dr. Julia M. James. The prizes together with a certificate, will be awarded during the closing sessions at the 12th International Congress of Speleology, La Chaux-de-Fonds, Switzerland

UIS Prize Chairman

Dr Julia JAMES, senior Vice President of UIS



A REMARKABLE VISION:

Forty Years of the Australian Speleological Federation

Based on an earlier version prepared for the ASF Conference Quorn, South Australia

Elery Hamilton-Smith

Rethink Consulting P/L

Beginnings

Inevitably, this paper has to tread the narrow line between the proper recounting of a story in which I have played some part, and self-indulgent nostalgia. But to simply tell the story might just be a dry-as-dust account of arguments over constitutional questions and the proper role of the organisation. Nostalgia deals with the real stuff of organisational life and so I trust I will be excused for any self-indulgence or bias in my version of the story.

I guess it all started with a trip to Yarrangobilly by Brian O'Brien and Fred Stewart of the Sydney Speleological Society in December 1953. Their trip report, in somewhat laconic style, says, 'We explored in the Western Deep Creek Cave for about half an hour, and intended to be in the Eastern Cave for a similar time, but here an untoward incident occurred which forced us to postpone the remainder of the trip.' (*Stewart & O'Brien 1955*).

This is not the place to detail that incident, but in short, as they were leaving the cave, Fred went back to camp, but Brian stayed behind to just have a look at another section of the cave, became lost, and ran out of light. On realising he was missing, Fred notified Bruce Hoad, then manager of the caves, and the police were called. After a cursory look in the cave, they decided that Brian must have become lost in the bush on his way back to camp and focussed their efforts on a bush search. Fred then called other members of the Sydney University Speleological Society, who all rushed to Yarrangobilly to join in. An item on the ABC news alerted others, and eventually over sixty cavers gathered. After 74 hours, Brian was found, in surprisingly good shape, by a group from Canberra and walked out of the cave with them.

Apart from Brian's survival, one of the most interesting long-term outcomes was that this incident brought to light the fact that there were in fact a number of informal groups going caving. In turn, this led to discussions about co-operation, particularly recognising the need for some sort of coordinated approach to safety and rescue. So sometime in 1954, a letter, signed by both Brian as President of the Sydney University Speleological Society and Ben Nurse as president of the Sydney Speleological Society, was sent off to caving groups in

Cooma, Canberra, Hobart, Mt. Isa, Orange and Adelaide.

The letter received in Adelaide, was duly discussed by the committee of the Cave Exploration Group of South Australia. The late Alan Hill, secretary of the Group, had developed a newfound and passionate patriotism towards South Australia rivalled only by his similarly passionate attachment to his hometown - Sydney. I recall very clearly his response: "We can't leave it to those bastards from Sydney; they think Sydney should run everything; tell them we'll convene a first conference!" So, in due course, an invitation was mailed off - and to our amazement, it was accepted, virtually by return mail.

Planning got under way, with an initial proposal to hold the first conference in Koonalda Cave. Reason prevailed, and so it was decided that the conference would be held in or near Adelaide, with a field trip to the Nullarbor.

The Inaugural Conference

Looking back now, I am amazed that the first conference and field trips really happened more or less as planned. It was a truly mammoth undertaking, as it involved a conference with attendance from every state and several international wanderers; a Nullarbor expedition of 62 people and a Kelly Hill Expedition of some 20 people.

All of this took place in a world where virtually all cavers were poor and few owned a car; hitch-hiking to caving areas was common; those cars that were owned went on grossly overcrowded journeys and often broke down; after all, some of them were over 30 years old.

I well recall hitching and truck driving all around Australia to 'sell' the conference and the Nullarbor Expedition. Because of the formidable logistics of a Nullarbor expedition in those days, we had to plan well ahead. By the beginning of April 1956, we had 62 people committed to and signed up for the expedition; although there were changes as the months went on, when the trucks rolled out at 4.00 a.m. on the 28th December, there were 62 on board! I also recall falling asleep as we drive out the gate of the conference centre and not waking until we reached Kyancutta that night.

*If you were capable of cloning your own body, and you were caught having sex with your clone,
Would that be called incest - or masturbation?*

The conference was held at the Parnanga National Fitness Council camp and although it was a bit hard to keep track of attendance, with both full-time attendees and day visitors, the total was probably some 130 people. The formal business of the conference was a very protracted discussion of what the Federation should be and what it should do. The possibility of a national society was considered and rejected in favour of a federal structure. A draft constitution was shaped by the meeting, the first office-bearers were elected (*Brian as President, Elery as Secretary, Ben as Treasurer and Ron Anderson as Librarian*), and a second conference was set down to be held in Hobart. Issues of safety standards search and rescue organisation, and setting standards for maps and reports were all canvassed, although at that time, the only action on these matters was to establish a safety code committee.

But in spite of the usual wrangling about constitutional niceties, the first conference was certainly distinguished by a sense of fun, unity and fellowship.

The Nullarbor expedition provided a particularly memorable event. Three groups, each of 19 people, were established, each group being basically self-contained and travelling on a Ford F500 Truck with petrol, water, food and caving gear, all carefully planned and arranged in advance by the Adelaide team. Each of the 19 people had pre-arranged responsibilities for various aspects of the program. Then five others, responsible for various aspects of overall expedition management, travelled in a VW Kombi. It probably seems bizarre today, but we had established that the only two bits of the Nullarbor surveyed to anything resembling a reasonable level of accuracy were the railway line and the coast. All else, including the state border, could not be accurately located. So the VW team included a professional surveyor who did two star fixes per night throughout the expedition and thus set up the ground control for the first reasonable quality topographic maps of the Eastern Nullarbor.

A range of other bits of pioneering research was done, all caves visited were mapped, and numbering of the Nullarbor caves commenced. In retrospect, the most remarkable achievement was the discovery by Alexander Gallus of the Koonalda Cave workshop, and by Adrian Hunt of the Aboriginal art within the same cave (*Wright 1971*). These two discoveries both constituted a massive revolution in Australian archaeology and the foundation of the scientific study of Australian rock art (*Flood 1997*). Joe Jennings also wrote the first of his many papers on the geomorphology of the Nullarbor (*Jennings 1961*).

But there were lots of other accomplishments. Joe had recognised that the expedition members were drawn from four different time zones - and so, of course, we had to have four New Year's Eve parties! Despite the impact of that night, Joe organised a survey training program the following day as we had discovered that we

had too few people with good experience in cave mapping. It is some tribute to the capacity of cavers to bluff that Paul Rose actually got a surveying job with the Snowy Mountains authority on the strength of that training.

We had told people at the conference that on the Nullarbor one only had to walk far enough in a straight line to discover a new cave - Tom Draper immediately put it to the test and discovered Tom's Cave in under 30 minutes. Then there were Jim and Ozzie from Orange. Jim went for a walk one morning and when Ozzie awoke, he set out to find Jim; in due course Jim returned, and then went to find Ozzie; Ozzie returned and went to find Jim, and so on for the day.

On return to Adelaide and the arranged expedition depot, Ben Nurse phoned up each of the major distributors of washing machines and arranged for them to deliver a machine for demonstration purposes. Not surprisingly, they all failed the test and no purchases resulted - but a lot of caving gear got washed. The expedition had also proved a wonderful opportunity for beard growing. Joe Jennings was so successful that he was able to get away with returning to the National University and attending, unrecognised, a reception for new staff members.

But the Federation was under way, with considerable enthusiasm.

Growing Up

At Easter 1957, the newly elected executive met at Yarrangobilly to commence planning for carrying out their assigned role. Here we saw both one of the early results of the Federation and the beginning of some of the divisions that have haunted the Federation over many years. Many of those who had attended the conference had been impressed by the cave numbering system which had been developed by Alan Hill and had determined that it would be executed more widely. So by Easter, the Sydney Speleological Society had been formally authorised by the Kosciusko State Park Trust to commence numbering of caves at Yarrangobilly. However, The Sydney University Speleos were adamantly opposed to cave numbering - and a dramatic confrontation developed during the course of the weekend.

By this time, the foundation membership was defined as including:

- Canberra Speleological Society
- Cave Exploration Group (South Australia)
- Cooranbong Speleological Association
- Cooma Cave Club
- Hunter Valley Caving Club
- Jenolan Speleological Society

- Mt. Isa Speleological Society
- Newcastle Technical and University College Speleological Society
- Orange Speleological Society
- Sydney Speleological Society
- Sydney University Speleological Society
- Tasmanian Caverneering Club
- Victorian Cave Exploration Society
- West Australian Caving Group

A number of these groups had been formally constituted out of pre-existing informal groups, at least partly as a result of the establishment of the Federation.

The second conference was a remarkably memorable one. It also focussed its proceedings very much upon constitutional wrangling - but again with great good humour and was followed by some remarkable exploration caving. Professor Carey spoke on his war-time experience at Mt. Etna, training commandos to fight in the caves of the Pacific region. The great Des Lyons made his particular mark on the occasion. Noel Fraser as minute secretary was being particularly punctilious about ensuring that all resolutions were clearly worded and properly recorded. At one stage, David Taylor was having difficulty getting his wording right; Des (*a lawyer*) assisted him in phrasing his intentions but David's gratitude was shattered by the next step, when Des said, 'Mr. Chairman, now that my honourable friend's intention is properly clarified, I intend to argue against it'. He did, and ensured its defeat.

Des also commemorated the occasion with a wonderful series of reports and poems in the next issue of the TCC Bulletin, many of which have stayed alive in the minds of those present or even absent (Lyons 1960). But more seriously, he had, as a one-man safety committee, drafted the Federation's first safety code and that made a great impact on caving practice. Until that time, we had such monstrosities as the people who refused to purchase safety helmets, and instead bought cheap aluminium kitchen basins from Woolworths and lined them with thin sponge rubber.

By now, cave numbering was widely accepted and used virtually right across the country. Various other initiatives were under way; the newsletter was formally established; and committees established on survey standards, Yarrangobilly, bat research, speleological terminology, code of ethics, and NSW co-ordination.

The third conference was held in Canberra; the constitution only occupied a small part of the agenda, but wrangles over the number of societies in New South Wales wasted a lot of time in this and the next few meetings. However, there was considerable progress: a revised safety code, a standard glossary of speleological terms, and a code of ethics and courtesy were all adopted and some first moves were made towards

advocating the conservation of caves. Given the difficulty in finding officers to take on the work of the Federation both prior to and following this meeting, it is indeed interesting that there was a high profile campaign for election of office-bearers and this in fact proved to boost the administration of the federation considerably.

Over the next few years:

- conservation emerged much more strongly and a first conservation code appeared
- the founders of Helictite endeavoured to get it accepted as an ASF responsibility, but this was rejected
- the Federation became deeply involved in negotiations with the NSW Tourist Bureau over caving opportunities at Jenolan
- the idea of a centralised cave map archive was rejected
- the infamous Bill Penman cave-sitting record led to one of the more divisive arguments within the Federation
- another source of division was the concern of some members that far too much attention was being devoted to the 'political' problems of caving in New South Wales
- the potential use of track marking as conservation strategy was first suggested
- the ASF Handbook idea - the first move towards a national karst index - was developed and the first edition published in 1968
- The Australian Bat Research Newsletter was established with the support of the CSIRO Wildlife Research Division and continued for many years before being replaced by the formation of a formal bat society with its own newsletter.
- The Edie Smith award was established to celebrate the work of one of the pioneer cavers
- Although the presentation of papers at conferences steadily increased over the years, it was not until the 1968 Goolwa conference that publication of proceedings commenced.

Into the Seventies

At the 1971 conference, a document, which I had prepared on the future structure and organisation of the Federation (*known as Elery's 'Green Thing'*), was discussed at very considerable length. This document was a response to long standing problems about the administration of the Federation, which had until then been divided between the annual meeting which made more-or-less ad hoc decisions and too few officers who were then responsible for implementing them. The new arrangements delegated greater responsibility to a series of commissions, established clearly defined terms of reference, and enabled the establishment of state liaison councils clearly defined. This in turn led to an administrative handbook, which provided a sort of owner's manual for the Federation.

As in many spheres of Australian life, the 1970s saw a great boom of activity and productivity within the Federation. Much of this was on a continuing business-as-usual basis, but with a gradual improvement in the quality of what was being done, but there were some important new initiatives. Greg Middleton commenced the compilation and publication of *Australian Speleo Abstracts*. A grant from the Australian Heritage Commission enabled the production of an important policy document on conservation of the karst estate of Australia.

One action with extremely important and far-reaching outcomes was the convening of a first conference on Cave Tourism at Jenolan in 1973. This was well attended, attracting cave tourism managers from all states of Australia. It led to a continuing series of such conferences, the involvement of the Federation in a number of important management planning projects, including that at Naracoorte which laid the foundation for the recent World Heritage recognition, and ultimately to the establishment in 1987 of the Australasian Cave and Karst Management Association (ACKMA).

Even during this period of activity, the Federation continued to face the inevitable and perpetual problems - lack of money, hence reliance upon volunteer workers for all of the federation's activities, and the inevitable unpredictability of those volunteers, who in spite of the best intentions, often found themselves frustrated, usually because their work responsibilities got in the way of caving. Particular angst was expressed about the Karst Index, which proved to be a mammoth project, but which finally appeared in hard copy in 1985. But looking back over the years of the Federation's existence, this and its many other accomplishments are indeed significant.

And More Recently

Many members will be aware of the more recent history and so I will only deal very briefly with some of the key issues of the 1980s and 1990s. Organisationally, the Federation became incorporated in 1985, and given the breadth of the Federation's activities, this provided a long-overdue improvement in infrastructure arrangements. However, divisive arguments and dissatisfactions have continued to emerge; these sometimes represent genuine differences in ideology, but it really seems to me that they more often represent lack of organisational experience by Council members and lack of resources to enable the Federation to achieve what members expect.

But in spite of recurrent problems -

- The Newsletter finally assumed the *Australian Caver* format and has become a worthy publication
- A Federation insurance scheme has become a reality

- Continuing its long commitment to conservation, the Federation has been particularly proactive and taken a more effective approach to conservation issues

The Federation and some of its officers and members have played a key role in the development of the NORLD program and the Outdoor Recreation Council of Australia. While the Council operates within a wider national framework for training development, which is extremely problematic, a great deal has been accomplished. It is interesting to note here that the NORLD conference demonstrated that no other outdoor activity has a body equivalent to the Federation, although canoeists have for some years had a national canoe education board and several are now looking at establishing some sort of national body.

Conclusion

Looking back, one can only marvel at the vision of those Sydney cavers who first proposed the establishment of the Federation back in 1954. Despite the current, hopefully temporary, breakdown in management, it has accomplished a great deal in spite of formidable difficulties.

It currently seems to face a new set of problems. Increasingly, clubs or societies with their emphasis upon collective responsibility are being pushed aside by commercial operations and other managerial arrangements. At the same time, a great gaggle of social and economic pressures are impinging upon younger people. So, club and society members are both fewer and older. Yet the capacity of the Federation for advocacy and action in relation to all sorts of issues - safety, documentation, conservation and advocacy to name only four - is probably more necessary than ever.

A second major problem of much longer standing is the decline in genuine exploration. Except in a few areas (*e.g. Old Homestead, Thampanna, some other Nullarbor sites, the Kimberlys, Cape Range and the Gregory River*) cavers keep returning to the same old caves, and adding little or nothing to our knowledge of those caves. Even the fact that the current conference (*and many of the more recent ASF conferences*) did not include genuine exploratory expeditions as part of the program highlights this problem. As one local example, the documentation of many Flinders Ranges caves is remarkably inadequate and very little has been done beyond the most basic documentation. Further, my knowledge of the region leads me to believe that there are probably two or three hundred further caves to be identified and documented. Virtually all of the many which Alan Hill and I identified on a 200-mile walking trip many years ago (*and which were not documented at the time because our field notes were lost following Alan's untimely death*) certainly remain uninvestigated. A brief and all too rapid recent walk by Ernst Holland certainly identified a further number in another region.

I believe it is vital that the current administrative malaise and decline in member confidence be addressed and resolved. I certainly hope that we will eventually see a wider revival of genuine exploration rather than the current pattern of repetitive tourist-type visits.

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Caving Insurance and Accreditation

Terry Bolger, an ACT Caver

I would like to relate a story about a recent experience, which has interesting implications for the insurance/accreditation issue with regards to caving.

A group of us were planning a caving trip to Thailand in April 1997. As the organiser, I was looking around for travel insurance. Many of the policies specifically exclude caving, abseiling, mountaineering, etc. but I found a policy that for our purposes only excluded "...pot-holing without an appropriate certificate". Unable to resist this challenge, I gave the insurance company a call in late February. "What do you mean by an 'appropriate certificate'", I asked. "Some sort of certificate by a certifying authority" came the response. "There is no 'authority' that gives certification for caving in Australia", I asserted confidently. I pressed on: "I have been caving for 25 years, and belong to a number of widely recognised caving groups in Australia and overseas. I can provide you with documentation as

to my membership in these organisations and as to my long experience in caving, but I have no certificate, appropriate or otherwise, that certifies me for caving. We don't believe in certifying ourselves, because then we just play into the hands of people like you!" She responded, "I'll have to talk with the person who wrote that section of the policy and get back to you".

Sure enough, a few hours later she called back. I told her more specifically what we were planning on doing in Thailand. She said she thought they could cover us for those activities (caving, abseiling), but they would discuss it at a group meeting and get back to me. About a week later, I heard back from them: "Mr Bolger, I must say that your inquiry has been the subject of a lot of discussion around here for the

past week. But we've checked into it and you are right, there is no authority for certifying caving in Australia, so we are going to re-write that part of the policy and delete the part about '...pot-holing without an appropriate certificate.' We are happy to cover you for your planned caving activities in Thailand under our policy", she said. "Can you put that in writing and send it to me in a letter?", I asked. "Yes, we will do that for you", she said.

A few days later, I received a letter stating that: "... the policy *will* cover any claims related to pot-holing *WITHOUT* 'an appropriate' certificate if no certificate applies to this activity." So there you have it. The victory was sweet, but more importantly, I think the moral is clear. What do YOU think?

UNSEEN DANGERS OF FOUL AIR & THE FLAME TEST

By Garry K. Smith

Condensed from a comprehensive paper by Garry, presented at the 21st biennial
Australian Speleological Federation Conference 1997.

Cavers may be putting themselves at risk without really knowing the full potential danger of Foul Air.

Foul Air refers to a cave atmosphere containing greater than 1% Carbon Dioxide (CO₂). In caves a high concentration of CO₂ corresponds to a reduced concentration of oxygen (O₂). This is the most likely hazard to be encountered in deep limestone caves with relatively still atmospheres. Having said that, one must be aware that there are many caving areas around Australia, where foul Air is not a significant problem.

To the novice caver the first encounter with foul air is often a frightening experience. Typically there is no smell or visual sign associated with foul air and the first signs are increased pulse and breathing rates. Higher concentrations of CO₂ lead to clumsiness, severe headaches, dizziness and even death.

Because the increase in CO₂ concentration in caves corresponds to depletion in O₂, cavers have for many years used the naked flame test to determine whether the cave atmosphere contained an elevated concentration of CO₂. The naked flame test involves lighting a match or cigarette lighter in the cave air, or carrying a burning candle into a suspected foul air area of the cave and the flame would extinguish when a particular concentration was reached. Some of you may recall an article I wrote (*published in Australian Caver No.133*), detailing flame tests which corresponded to CO₂ concentrations widely accepted by the caving fraternity as fairly accurate indications of percentage concentrations. This article is accurate in other respect, however I have undertaken extensive testing which reveals that **the Naked Flame Test can not be relied upon to measure CO₂ concentrations**, other than to indicate that the atmosphere is most likely dangerous to human life.

Elements required for Combustion

Most people are aware that before combustion can occur, three conditions must be satisfied.

1. There must be a fuel or substance, which can be burnt.

2. The fuel must be heated to its *ignition temperature*. That is the lowest temperature at which combustion can begin and continue.
3. There must be enough oxygen to sustain combustion, either in the surrounding air or present in the fuel.

Without going into the subject too deeply, one can see that the naked flame test is actually measuring the concentration of O₂ required to sustain combustion of various fuels, such as the match, butane cigarette lighter fluid or paraffin candle wax. Extensive tests in controlled atmospheres have proven that each of these fuels extinguishes at around the 14.5 to 15% O₂ concentration by volume. Having determined this I carefully researched cave atmosphere data from many caving areas and it was evident from my observations and those of other researchers and authors that CO₂ enters caves by several methods. Each method has a bearing on the gas ratio composition of the cave atmosphere and its variation to that of the above ground atmosphere.

Without sophisticated measuring instruments a caver cannot determine the CO₂ concentration as the flame test only measures a lack of oxygen. To make things really complicated, it is not the lack of Oxygen, which is the real danger in the majority of cave atmospheres, but the elevated CO₂ concentration. This can be identified if one studies the tables below and considers that humans expire air during normal breathing, composed of approximately 5.6% CO₂ and 14 to 15% oxygen. This is sufficient to revive a person with Expired Air Resuscitation. (EAR).

Effects of CO₂ on Humans

As each persons body has a slightly different reaction and tolerance to stressful situations the following symptoms are general, however nobody is immune to the dangers of CO₂.

Table 1. Generally accepted physiological effects of CO₂ at various concentrations by volume.

Concentration	Comments
0.03%	Nothing happens, as this is the normal carbon dioxide concentration in air.
0.5%	Lung ventilation increases by 5 percent. This is the maximum safe working level recommended for an 8 hour working day in industry (Australian Standard).
1.0%	Symptoms may begin to occur, such as feeling hot and clammy, lack of attention to details, fatigue, anxiety, clumsiness and loss of energy.
2.0%	Lung ventilation increases by 50 percent, headache after several hours exposure.
3.0%	Lung ventilation increases by 100 percent, panting after exertion, headaches.
5 - 10%	Violent panting and fatigue to the point of exhaustion merely from respiration & severe headache. Prolonged exposure could result in unconsciousness and death.
10 - 15%	Intolerable panting, severe headaches and rapid exhaustion. Exposure for a few minutes will result in unconsciousness and suffocation without warning.
25% to 30%	Extremely high concentrations will cause coma and convulsions within one minute of exposure.

Effects of O₂ deficiency on Humans

If we consider an atmosphere consisting of just N₂ and O₂, where the O₂ is at a lower concentration than the normal atmosphere, the human body would be affected in the following manner. (*Laboratory Safety Manual, 1992*)

Table 2. Generally accepted physiological effects of reduced O₂ concentrations.

O ₂ % by volume.	Symptoms
reduced from 21 to 14%	First perceptible signs with increased rate and volume of breathing, accelerated pulse rate and diminished ability to maintain attention.
between 14 to 10%	Consciousness continues, but judgment becomes faulty. Rapid fatigue following exertion. Emotions effected, in particularly ill temper is easily aroused.
10 to 6%	Can cause nausea and vomiting. Loss of ability to perform any vigorous movement or even move at all. Often the victim may not be aware that anything is wrong until collapsing and being unable to walk or crawl. Even if resuscitation is possible, there may be permanent brain damage.
below 6%	Gasping breath. Convulsive movements may occur. Breathing stops, but heart may continue beating for a few minutes - ultimately death.

There are two main methods in which CO₂ gets into caves.

Bear in mind that a cave atmosphere may have formed by a combination of these factors and as such the actual gas ratios in a particular cave may vary from the theoretical concentrations listed below.

1. CO₂ is absorbed by the ground water as it passes through surface soil containing high concentrations of the gas, due to the decay of vegetation. This water percolates through the rock strata and enters the cave system, usually taking part in the calcite deposition cycle. In this instance the addition of extra CO₂ to the cave atmosphere displaces O₂ and nitrogen (N₂).

*If you were capable of cloning your own body, and you were caught having sex with your clone,
Would that be called incest – or masturbation?*

Theoretical gas concentrations in cave atmosphere. Scenario 1.

Total CO ₂ concentration in Cave atmosphere	Total O ₂ concentration in cave atmosphere
1%	20.75%
2%	20.50%
3%	20.25%
4%	20.00%
5%	19.75%
6%	19.50%
10%	18.50%
24%	15.00%

2. Secondly, CO₂ may be a by-product of organic and microorganism metabolism or respiration by fauna such as bats or humans. Simply the oxygen concentration is reduced in proportion to the increase in CO₂. The N₂ concentration stays constant.

Theoretical gas concentrations in cave atmosphere. Scenario 2.

Total CO ₂ concentration in Cave atmosphere	Total O ₂ concentration in cave atmosphere
1%	20.00%
2%	19.00%
3%	18.00%
4%	17.00%
5%	16.00%
6%	15.00%
10%	11.00%
13%	8.00%

3. The other factor that one has to consider is that in deep caves where air movement is minimal, CO₂ will build up in the lower part of the cave. So, even though the CO₂ may have entered the cave by one of the two above mentioned methods, a very still cave atmosphere may allow CO₂ to sink to the deepest part of the cave and displace O₂ and N₂. Thus building up the concentration of CO₂ to a higher concentration, at the lowest point in the cave.

Even though CO₂ is 1.57 times heavier than nitrogen and 1.38 times heavier than O₂, it will have a tendency to disperse in an isolated volume of air, due to molecular diffusion. In other words a mixture of gasses will not separate into layers of various density gases if they are left for a long time in a still chamber. A possible explanation of the high concentration of CO₂ in deep caves (*with a relatively still atmosphere*), is that CO₂ is being produced metabolically or entering the cave via ground water at a greater rate than the gas can diffuse into the cave atmosphere, thus settling at the bottom of the cave because it is a dense gas.

Theoretical gas concentrations in cave atmosphere. Scenario 3.

Total CO ₂ concentration in Cave atmosphere	Total O ₂ concentration in cave atmosphere
1%	20.25%
2%	19.51%
3%	18.76%
4%	18.01%
5%	17.27%
6%	16.52%
7%	15.78%
8%	15.03%
9%	14.28%
10%	13.54%

"If you were driving along at the speed of light in your car, and you turned your headlights on - What happens???"

-- Anonymous

Conclusion

If sophisticated measuring equipment is not available, the best advice is to carry out a "Naked Flame Test" when you or a member of your group experiences the first signs of labored breathing, headaches, clumsiness, loss of energy or any of the other signs associated with elevated concentrations of CO₂. Ideally cavers should use a cigarette lighter flame. This will reduce the amount of unpleasant fumes emitted from matches burnt by people experimenting in the confines of a cave. The best advice is, "If in doubt, get out", in an orderly manner.

Laboratory tests have proven that combustion of each of these fuels will cease at about 14.5% to 15% concentration of oxygen. Twenty one percent (21%) being the concentration in normal atmosphere. Bearing in mind that humans on average breath out air containing 15% oxygen and this is enough to revive a person using mouth to mouth resuscitation. In fact humans can survive in an atmosphere containing 10% oxygen, so when the flame test just fails it is still measuring an atmosphere containing enough oxygen to survive.

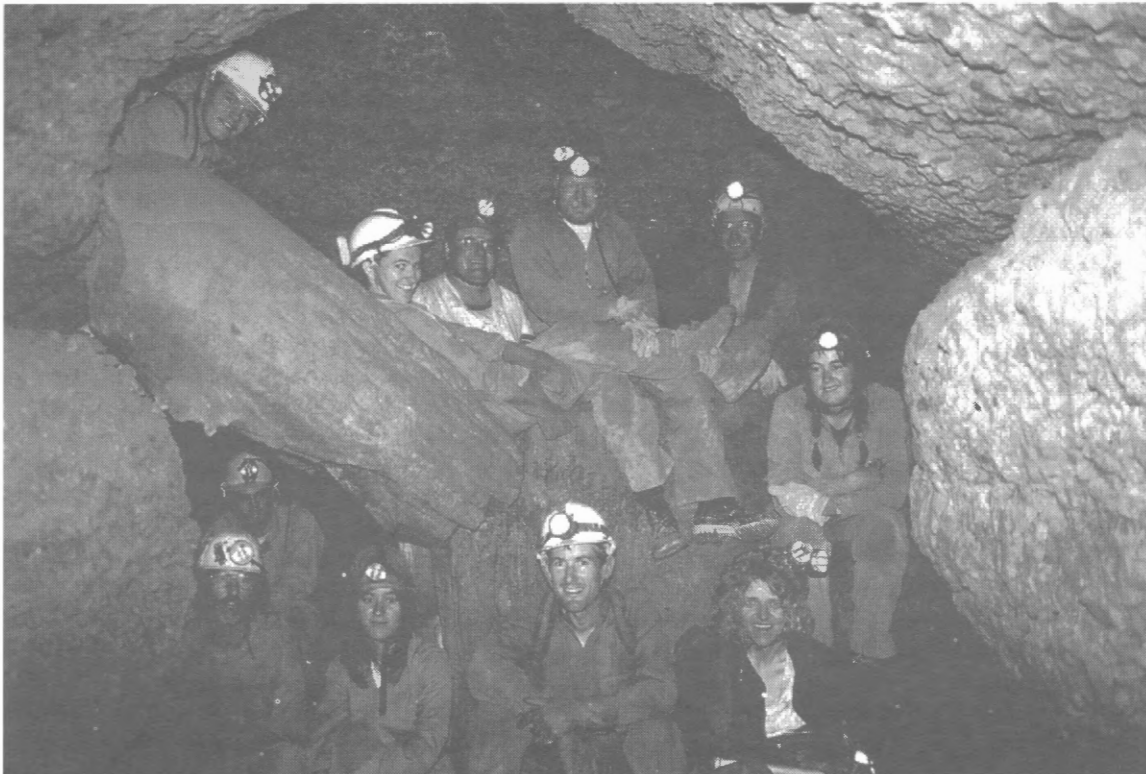
The real danger is the carbon dioxide concentration, which is the main trigger for the human body to increase

the breathing rate. As listed above prolonged exposure to a concentration of just 5 or 6% may cause suffocation. In the majority of cases, if a person has any of the symptoms of elevated carbon dioxide levels, a simple naked flame test will fail to ignite. This is a sure sign of foul air and it is time to get out.

It would appear conclusive that the naked flame test is measuring primarily the O₂ concentration and that the CO₂ concentration has no significant influence on the flame. The accepted CO₂ concentration from "Naked Flame Test", adopted as the ASF Cave Safety Guidelines, 27th Jan. 1990 (Australian Caver 1990) are essentially meaningless other than to indicate an atmosphere which could be hazardous or life threatening

Carbon dioxide when treated with respect is no worse than the other dangers in caves, such as infections of cuts and abrasions, histoplasmosis, hypothermia, equipment failure, becoming wedged in a tight squeeze, trapped or drowning by rising flood waters, sustaining injury from a loose rock dislodged overhead, and loosing your footing or grip on small climbs.

Despite the seemingly endless list of possible dangers, caving is still safer than driving a motor vehicle, which most of us take for granted.



What are these people breathing? Post Conference trip to Corra-Lynn Cave (Y-1) South Australia. In a clockwise direction from top left are:- Micheal Smith, Jenny Whitty, Brendan Ferrari, David Wools-Cobb, Mark Sephton, Anne-Marree Meridith, Marie Choi, Gary Whitby, Pam Alaro, Chris Riley, & Rito Zollinger.

Photo By Garry K Smith.

*If you were capable of cloning your own body, and you were caught having sex with your clone,
Would that be called incest – or masturbation?*

Rockfall in Weebubbie Cave

6N-2 October 1996

Norman Poulter - SRGWA

Introduction:

During the latter part of 1996, a cliff collapse took place on Western Australia's south-west coast near Gracetown which killed 9 people, including 4 children.

Approximately one month later [October 9], a rockfall occurred in Weebubbie Cave 6N-2. A company of Girl Guides had visited the cave the previous evening and a small team of SA divers were in the cave at the time of the collapse although well clear of the fall site.

Most likely the Gracetown tragedy had some influence in the decision of the land manager, Dept. of Land Administration [DOLA] to shortly thereafter permanently close access to Weebubbie Cave. There was no distinction between uninformed members of the public and experienced speleologists or cave divers.

As the first speleological society venturing out to the Nullarbor less than 3 months after the rockfall, SRGWA sought permission to view the cave and make comments on the extent of the rockfall and likelihood of further falls. This application was supported by the South Coast Region of CALM as managers of caves in the adjacent Nuytsland Nature Reserve and the potential future manager of Weebubbie Cave.

Below is a summary of SRG's investigation of the rockfall, condensed from a report submitted to DOLA during March 1997. Anyone wishing to read the full text should contact the ASF Librarian.

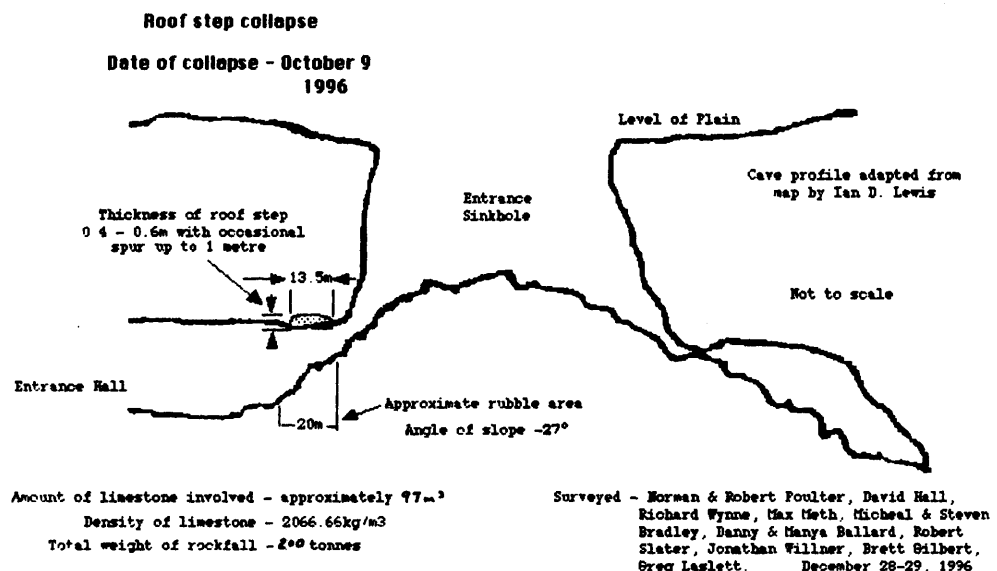
Background:

Weebubbie is a registered aboriginal archaeological site [aborigines are reputed to have extracted flint from the cave], not sighted by European Australians until two employees of the South Australia Telegraph Department [Clayer and Junken] chanced upon it in early 1900 [Poulter 1987]. The pair lodged an application for a 80,000 acre [32,375 hectare] grazing lease which included the cave, no doubt planning to exploit the water resource it contained. While granting Clayer and Junken a 40,000-acre lease on August 2 of the same year, the Surveyor-General placed a temporary 5,000-acre reserve around the cave.

Clayer and Junken sought compensation for "finding" the water resource and then losing access to it. The government favored such a reward [provided a government appointed inspector submitted a favourable report as to the quality of the water] and suggested the pair nominate a suitable sum. When Clayer and Junken applied for £500, the government's friendly attitude

Just prior to Christmas the author signed an indemnity form on behalf of the Australian Speleological Federation Inc. that enables all members of the ASF [cavers and cave divers] who subscribe to the ASF's insurance policy access to Weebubbie Cave and all other caves on DOLA territory throughout Western Australia.

Weebubbie Cave (6N2)



"If you were driving along at the speed of light in your car, and you turned your headlights on - What happens???"

-- Anonymous

changed and despite much telegraphic prodding from the pair, the government failed to dispatch an inspector to sample the water. During March 1901 John Muir, Inspector of Engineering Surveys PWD, was examining the country between Kalgoorlie and Eucla in relation to either constructing a future transcontinental railroad direct to Eucla and thence to Tarcoola SA or send a spur line down from a more northerly east-west route. The main reason behind such a plan would have been to carry supplies for the railroad construction utilising the already existing Eucla jetty. Clayer and Junken prevailed upon Muir to inspect the cave's water and forward his opinion to his superiors. Muir's October 1901 report, accompanied by three interior photographs of the cave, concluded the lake to be a "small underground reservoir" due to the "impervious character" of the surrounding strata and that the estimated 3 million gallons of highly mineralised water not suitable for stock.

On the strength of this report, the government refused a reward to Clayer and Junken, despite their protests that Muir's observations were no more than casual and that he was not qualified to pass judgement on the water quality. Shortly afterwards, Clayer and Junken left the area.

Attitudes change with time and in December 1927, a proposal was made to give the reserve permanent status and lease it for stock watering in order to raise money from the resource. On January 4, 1928 - Water Reserve #19713 was leased to JD and OD Jones for grazing purposes at 10 shillings a year, subject to the public having free access to the water. The lease was cancelled in 1930 due to non-payment of fees. Later attempts to re-lease the cave's resource appear to have been short-lived. A minor panic occurred during 1964 when it was discovered that the cave was not in the reserve that had supposedly been thrown around it. The cave was quite some distance outside the boundary, an error that was rectified later in the year.

Fauna:

Many collapse dolines of the Nullarbor have flourishing flora, sheltering from the frequent intense and drying winds while drawing additional moisture from that which percolates through the base rock.

The entrance doline of Weebubbie Cave has several examples of native flora growing up to 30m below the level of the surrounding Plain [grasses, acacias] while others are introduced, such as the edible Glossy Nightshade.

Caves of the Nullarbor contain distinct fauna. This fauna can be;

trogloxene - [spends part of its lifecycle in caves and returns periodically to the surface for food]

troglophile - [frequently completes its life cycle in caves but is not confined to this habitat]

troglobite - [unable to live outside the cave environment]

There is a diverse fauna regime living in Weebubbie Cave ranging from the daylight zone to the furthest extremes of the dark zone. The "Distribution of Recorded Fauna" listed in the "Caves of the Nullarbor" [1967] record Weebubbie as being habitat for;

Araneae indet.

Spinturnix sp. (bat parasite)

Acarina indet. (bat parasite)

Polyzosteria pubescens Tepper (accidental)

Rhaphidophoridae sp.

Psyllipsocus ramburi Selys-Longchamp.

Speotarus sp.

Brises acuticornis Pascoe

Lathridiidae sp.

Chalinolobus morio (Gray)

Since the initial publication of the "Caves of the Nullarbor" and the above list [1967], several new creatures have been discovered and are listed below;

Spider	Janusia muiri [possibly 1971]	troglobite.
Isopod	[1981 Robert Poulter]	troglobite, species unknown
Cockroach	[1982 Norman Poulter]	troglobite - possibly Troglobattella nullarborensis
Beetle	Speozuphium poulteri [1985]	troglobite [Moore 1995].

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The Collapse:

The collapse of part of the roof of Weebubbie took place sometime during October 9, 1996. A party of WA Girl Guides, led by Justin Sharman of the Western Australian Speleological Group [WASG] visited the cave the previous evening [7:30 - 9:30pm] and stayed overnight, leaving the morning of the collapse [Sharman 1997].

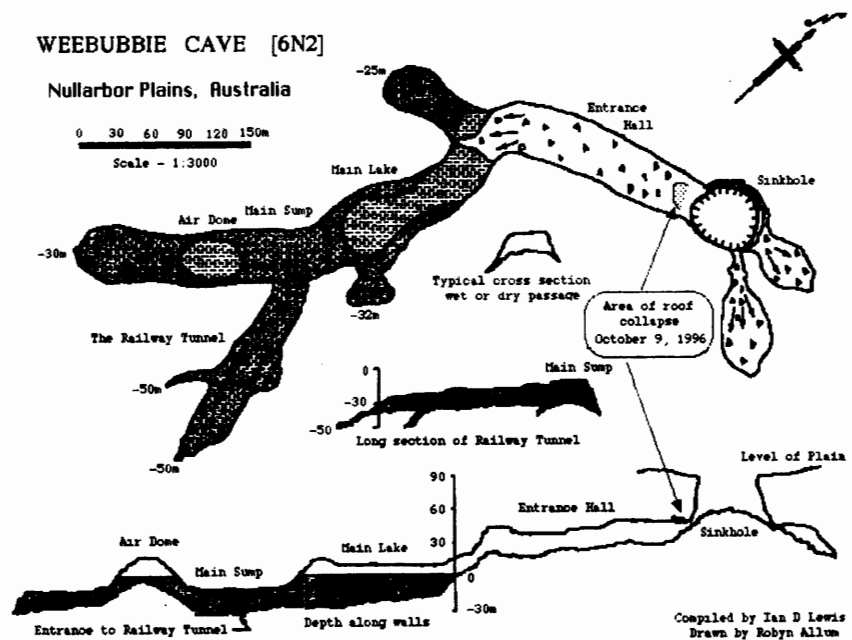
At the time of the collapse, a party of cave divers from South Australia was in the cave. At time of writing it is not known who they were but they had just retired from the water at the time of the rockfall [Jefferies 1997]. Some of their equipment passing through the rockfall area [240v electrical lead, 6mm copper air line] was buried.

The cave was visited by the Eucla Police and later Ian Misich [Geotechnical Engineer, Mining Operations Division] of the Department of Mines. He submitted a short report accompanied by several photographs to the Department of Land Administration [DOLA].

On the strength of the Misich report, DOLA closed the cave, had the uppermost ladders removed and commissioned several signs to be erected in strategic locations advising the general population that the cave was closed. There was no distinction between untrained members of the public and experienced speleologists and cave divers.

Prior to the collapse, SRGWA was preparing for an expedition to the Nullarbor and in early December began negotiations with DOLA to gain access to the cave in order to ascertain for themselves the severity of the collapse and its potential for further rockfalls. This was prompted in part by conflicting media reports immediately after the October collapse. These reports inferred that several thousand tonnes of rock were involved. The application by SRGWA was supported by Dr. John Watson, Regional Manager of the South Coast Region, Department of Conservation and Land Management [CALM].

The South Coast Region of CALM manages the Nuytsland Nature Reserve that contains numerous caves, several of which are highly significant and embody lakes. However, CALM does have an interest in Weebubbie Cave as Reserve 19713 is proposed to become vested in the National Parks and Nature Conservation Authority as "National Park and Water" in the [statutory] CALM South Coast Regional Management Plan 1992-2002. Because CALM administers other WA Nullarbor sites of interest to cave



divers together with a commitment to do so in parallel with agencies elsewhere in Australia, notably South Australia, visits to Weebubbie Cave by cave divers are also administered by CALM using strict protocols of the CDAA [Watson 1997].

As mentioned above, when DOLA closed access to the cave it commissioned the design and construction of large warning signs, which were apparently installed during early December.

SRGWA inspection

After submitting documentation to the Eucla Police, members of SRGWA visited the cave during December 28-29, 1996. Initial inspection revealed that;

1. Contrary to some media inferences, the collapse occurred inside the cave, beyond the weather-line,
2. the amount of rock involved proved to be significantly less than media reports implied,
3. for a rockfall that was less than 3 months old, the newly fallen rock was remarkably stable.

Over the next two days, members conducted a survey of the rockfall area [Figures 1 & 2]. The conclusion being that the collapse involved the natural weathering of a roof-step through salt wedging or the drying out of clay interbeds. This weathering process is common throughout the Nullarbor and fine examples can be seen in Weebubbie, Abrakurrie and Mullamullang Caves. Caves of the Nullarbor are still actively forming through the salt wedging process. Roof-step collapses are often associated with a high degree of passage infill [notably Mullamullang which has about 40 major rockpiles along

"If you were driving along at the speed of light in your car, and you turned your headlights on - What happens???"

-- Anonymous

its 5km length]. An exception to this is Abrakurrie Cave where most of the resulting rockpiles have been removed by subsequent solution processes. The roof steps of Weebubbe are quite pronounced.

In the chapter dealing with Karst Processes, Jennings [1978] states in sections sub-titled Collapse and Cave Weathering;

"The semi-consolidated dune limestones of Australia are particularly prone to piecemeal collapse, creating domes... The chalky bryozoal limestones common at depth in the Nullarbor Plain, Australia, are also weak enough to produce barrel arches, apses and high domes in profusion..." page 30

"... There is also the force of crystallization of mineral salts (salt wedging) to be considered. Conversely, it has been suggested that the drying out of clay interbeds or breccia fills in fissures may reduce cohesion and shear strength." page 31

"Some caves or parts of them are dry enough to allow crystallization of salts by evaporation and so salt wedging can become important. Gypsum is the more widespread mineral to form and act in this way, but its effects are small in comparison with those of halite in the Nullarbor Plain caves (Lowry and Jennings 1974); roof dome formation here may owe much to this process,..." page 32-33

The SRG survey found that approximately 97m³ of rock was involved in the collapse. The fall created another "roof step", a common feature of Nullarbor caves. Weebubbe Cave has several roof steps of varying depths along its ceiling and these were visible in the photographs of both Weebubbe and Abrakurrie Cave that accompanied the report. Abrakurrie is another popularly visited cave on VCL. As indicated in the diagrams of Weebubbe, the rockfall took place approximately 4-5m from the inner lip of the entrance cliff-line and extended along the ceiling for 13.5m varying in thickness from 0.4 - 0.6m with occasional spurs up to 1 metre. The width of the collapse was determined to be 18m, approximately 80% of the passage width.

The entrance rockpile at the region of the collapse sloped at 27° and rubble from the fall occupied approximately 20m of the downslope area indicating very little rock rolled downslope [approximately 7m] after impact. The vertical distance that the rock fell varied from approximately 4m near the entrance to about 11m at its furthest point. As mentioned above, the newly fallen rock is remarkably stable for such a "young" rockfall. During the course of the investigation, only 2 or 3 rocks were found that moved

when trodden on or leant against. The determination being that the entire 97m³ "step" more or less fell as one piece and not piecemeal, breaking up on impact.

SRGWA feels confident that the entire rock strata fell during the October collapse and that further rockfalls are unlikely in the immediate future. As stresses build up or are relieved in other bedding planes as a result of this fall, minor falls could occur from those stratas.

Most of the fallen rock broke into small blocks on impact, the exception being a 3m vertical slab on the northern side of the passageway beside the "new" pathway. A larger rock nearby predates the fall. A small sample of fallen rock was removed from the cave for tests back in Perth.

During the course of the visit, SRGWA took the opportunity to place a reflective marker route through the rockfall area [closely following the previous route] and defined the preferred route to near the lake's edge. This is in accordance to methods developed over several years, endorsed and supported by CALM and various other government and semi-government instrumentalities in Western Australia. [Poulter 1993 & 1994]. Sections of the route through the newly fallen area were "hardened" by placing rocks in a flatter position to make stepping on them easier and therefore safer. Experience has shown that where a marked route exists, people tend to follow it with little deviation.

Laboratory tests in Perth revealed that the density of the fallen limestone to be much less than that of pure limestone. Pure limestone weighs 3139.53kg/m³ while the Weebubbe sample indicates a weight of 2066.66kg/m³. This placed the estimated weight of the Weebubbe rockfall at 200 tonnes, considerably less than the 2000 tonnes bandied about in the media.

Discussion:

The Department of Land Administration has already determined the public should be forever denied access to Weebubbe Cave as a result of the October 1996 rockfall. In many respects, this is a regrettable outcome - given the unsurpassed beauty of the cave and its sediment-free lakes.

The only other cave on the Nullarbor that the public has unfettered access to is Cocklebidy Cave [6N-48] on CALM's Nuytsland Nature Reserve. Although this sediment-rich lake cave is spectacular in its own right, it does not surpass that of Weebubbe.

An alternative would be to re-examine the cave periodically with a view to restoring public access. If re-opened to the public, the current signs would need to be replaced, possibly advising that ALL caves suffer rockfalls [without warning] of varying severity from time to time [emphasising the extent of the 1996 fall]

and that entry to the cave [or any other on DOLA territory] is at their own risk.

Recommendation:

From our investigation of the Weebubbie collapse we submitted the following recommendation to DOLA bearing in mind that they had already determined that the public should be denied access as a result of the October rockfall.

If the current policy of non-access to the public is to remain then SRGWA would recommend that any sign that DOLA has erected that is visible from the Eyre Highway or roadhouse environs be removed to lessen their "magnetic" appeal. All other signs [there are 4] should remain in place.

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Acknowledgements -

As with most undertakings, the contents of the report were the compilation of many people's work.

The author would like to thank the members of SRGWA, CEGSA and visitors who participated in the SRGWA 1996-97 Nullarbor Expedition and whose names were attached to Figure 2 of the original report.

The report could not have been completed without their valuable input and comments.

Special thanks were extended to Mr. Allan Gorham [Physics Dept. UWA] for assistance in determining the density of the limestone sample from Weebubbie Cave and The Centre for Microscopy & Microanalysis for use of computer scanning and image manipulation equipment.

The final text of the report is the result of corrections and comments provided by Professor Elery Hamilton-Smith [LaTrobe University], Ms. Heather Jefferies [SRGWA] and Dr. John Watson [CALM].

SUUNTO COMPASSES - TIPS AND TRAPS

Ken Grimes

(Convenor: ASF Surveying and Mapping Standards Commission)



I think that most Australian cave surveyors use the SUUNTO KB-14 series compasses, and the matching PM-5 clinometer. These are compact rugged units, but there are some potential problems in their use that you must be aware of.

Sighting through the

SUUNTO.

If you use a SUUNTO KB-14 series compass in the manner usually recommended you may find you are getting errors of several degrees in your bearings.

The "recommended" **Two-Eye Method** involves looking into the eyepiece of the compass with one eye and simultaneously looking with the other eye past the compass to the survey station. One's brain sees an image of the compass scale superimposed on the image of the station. The alternative **One-Eye Method** involves shutting one eye and alternatively looking through the compass eyepiece and over the top of the compass towards the station. With experience one can get a position where both the scale and the distant target can be seen simultaneously. This second method would seem less accurate but an experiment suggests otherwise.

Some time back I collected data at a UQSS S&T day. A group of 14 cavers took sightings at three distant features. Twelve used the recommended two-eye method, with first the left and then the right eye looking into the compass (*the other two knew they had eye problems that made it impossible to use this method*). Six of them then took sights using the one-eye method, looking over the top of the compass.

I averaged the results to get the presumed correct bearing for each feature, and calculated "errors" as differences from this mean. The standard deviation from the mean was about one degree for each station.

The **Two-Eye Method** was decidedly less accurate than the one-eye method for most people. 12 people (6 experienced surveyors, and 6 novices) took a total of 66 sights using the two-eye method. The average error (*difference from the mean*) was 1.1 degrees, but the maximum error was 3.8 degrees - this latter was from an experienced surveyor, who was however aware that he had one eye dominant over the other, and who normally used the one-eye method. There was little difference

between the experienced cavers and the novices. However some novices initially made gross errors due to reading the scale in the wrong direction (*I was the first to sight in each case, so I spotted these errors and showed them the correct way - which is right-to-left*). Some novices also made gross errors with the clinometer - reading in the wrong direction, or reading the 'percent grade' scale.

The **One-Eye Method** was more accurate, though one must remember that this was tried only by the six experienced cavers. The average error for the 6 people that did the one-eye method was 0.5 degrees, and the maximum error was 1.2 degrees. Again, the maximum error was from an experienced surveyor! But, not the same one as above. However, it was only in one of his three readings so perhaps he had an intermittent glitch?

The problem with the two-eye method would seem to be that some (*many?*) people have "lazy eyes" which do not always point in parallel directions. The problem becomes worse when one is tired - i.e. in the second half of a long surveying trip! I have this problem myself - possibly a result of many hours spent looking at stereo air-photos, where one deliberately swivels ones eyes in different directions!

Surveyors using Suunto compasses (*and that is most of us*) should check their own eyesight - trying both methods (and trying both left and right eyes to the compass window in the two-eye method). If you tend to get significant differences between the methods or between left and right eyes in the two-eye method then perhaps you should change to the one-eye method.

There is a SUUNTO model that has a prismatic housing mounted on the top. I am told that this is not as easy to use as the usual model, but it might be more accurate if used one-eyed.

Lighting the SUUNTO.

As with all compasses, one has to be careful not to bring magnetic or ferrous objects close to them. There was also a suggestion that the current through a light bulb might generate a significant magnetic effect. I experimented with my cave lights. My electric cap light had no effect when worn in the usual position. Switching it on & off made no difference. From this position it is possible to light the compass by holding your hand above and partly in front of the light so that some of the photons are bounced down onto the card - it helps if you have a clean hand! Moving

*If you were capable of cloning your own body, and you were caught having sex with your clone,
Would that be called incest - or masturbation?*

the cap lamp closer to the compass caused a deflection when it got within 5cm.

My Premier (*hand held*) carbide light started to effect the compass if held closer than 35cm. The brass helmet-mounted carbides might be better.

Both my backup battery-powered pencil torches caused strong effects (*regardless of whether they were turned on or off*). Depending on just where you held it the effect could be seen while the torch was up to 15cm away from the compass. One torch had a metallic case (*but I think it's aluminium*) and the other was plastic but both gave similar effects. After a bit I thought to try a penlight battery (*alkaline type*) on its own. It also gave a strong effect - similar to that of the torch. There is a polarity effect - one end of the battery is north, the other south. So in effect any battery powered torch should be kept well away from a compass and not used for reading it !! With experiment, I found that the effect was minimal if I lowered the torch vertically so it was exactly above the centre pivot of the compass card (*i.e. the magnetic field was even on all sides of the compass*) - but I would not rely on being able to do that accurately in a cave! I do not have a Petzl Zoom or similar unit with helmet-mounted battery. If you do, it might be worth testing it. In theory, a battery pack mounted at the back of a helmet should be more than 15cm from the compass, and also the 4 batteries usually mount in alternating directions and so might tend to cancel each other - but test your own unit.

Candles & cyalumes should not be a problem!

SUUNTOS with internal lights.

I have just bought a SUUNTO (KB-14/360RB) which has a built-in battery light. I have yet to use this in a real cave survey, but I tested it at home. Switching its light on and off had no effect. Removing the battery pack had no effect. This is as one would expect - obviously SUUNTO have done a proper job on the design. The battery is a tiny (match-stick diameter) thing with a match-head sized bulb at one end. You press a rubber button to turn it on. The light & battery unit plugs into a hole in the side of the compass and is held in place by the friction of the rubber seal. I was uncertain about how water-proof this would be, but a Tasmanian user at the recent ASF conference indicated that he had had no problems in wet Tassie caves. I am not sure how long the battery lasts. I intend to extend its life by using my hand over my cap lamp to light the unit whenever I can, and only resorting to the internal light when that is impossible.

SUUNTO also has a KB-14/360RT compass with a Tritium "light". Tritium emits "soft" beta particles which cause fluorescence of a coated plate mounted above the card. A user at the ASF conference said that this light source was a bit weak, but the intensity of the glow could be enhanced by holding it in front of one's helmet light immediately before use. I once used a different brand of

compass with a tritium light and found the light OK, but the compass itself was not! Note, that the tritium light becomes weaker with time (*tritium has a half life of 12.5 years - so the light intensity will halve over that time*).

These lighted versions of the SUUNTO cost about \$50 more than the standard model, but are worth considering as they avoid the problems of magnetic effects from other light sources.

Recent (tax-paid) prices (from Prospectors Supplies in Sydney) were:

SUUNTO KB14/360R	(standard model)
\$122.26	
SUUNTO KB14/360RT	(Tritium light)
\$168.55	
SUUNTO KB14/360RB	(Battery light)
\$160.25	
Replacement battery units for the 360RB	
\$ 17.80	

Freight would be extra. The "360R" part of the code indicates that the compass has a 360 degree scale with Reverse bearing numbers also. Other versions exist, but are not stocked by Prospectors Supplies. Check with Prospectors Supplies at (02) 9838-7899 for current prices, or ask for their mail-order catalogue which has a wide range of surveying, geological, meteorological and other field gear (*mention that you read about them in Australian Caver*). They also sell a \$12 rubber protective cover for SUUNTO compasses and clinos which is a good way to reduce the impact on both the cave and the compass when it falls out of your pocket. The cover has sighting holes so it can be left permanently on the instrument.

Sticking cards.

This is generally a fault in the observer, not the compass! It is important to ensure that the compass is held level while reading it or else the card may tip and touch the top or bottom of its container and stick - giving a spurious reading. It is advisable to get into the habit or always rotating the compass slightly to left and right before reading it to make sure the card is spinning freely.

Sighting at steep angles.

All compasses present a problem when one is working in vertical or steeply dipping cave systems. It is difficult to ensure that the compass is in fact pointing correctly towards a target that is above your head or below your feet! Possible ways of improving the accuracy of the reading include the following.

- For targets above you, use a plum bob hanging from the target and sight on the plum. You can use the tape as a plum if you hang a crab or something heavy from the end of it.

- For steep shots, where a plumb line will not hang free, pull the tape tight between the two stations and sight horizontally at the tape from the lower station. Or tighten it, then slack it off to drape over the slope and sight on that.
- The swiss cavers use a gadget mounted on the SUUNTO compass: I have not seen this, but gather that it uses a glass (*or perspex?*) rod bolted or glued across the front of the compass at (*exactly*) right angles to the line of view. You put a light on the target and the light will be reflected through the rod so you can see it while holding the compass horizontal. You rotate the compass to centre the light and then read the bearing. The problem is that you must make sure that the compass is perfectly level or the light will be offset to left or right and give an error in direction. Brunton compasses, and some orienteering compasses, have a mirror which lets you sight at an inclined target, but again you have to have the compass exactly level - the Brunton has a bubble which helps with this.

Sighting from a station against a wall.

This problem applies to all compasses and clinos. Where it is not possible to sight from directly on the station, because of obstructions or the excessive thickness of your head, it is necessary to move away to one side, or above or below it (*with a clino*). This is OK provided that you allow for the offset by sighting to an imaginary point offset from the target by a similar distance and direction. This obviously involves some user estimation, and is less accurate; so where possible try to avoid selecting such stations in the first place. An alternative is to measure the offset at your end as a separate, very short, survey leg.

Using the SUUNTO Clinometer

This is simpler to use as there is no worry about magnetics, and the two-eye problem only occurs if you are lying on your side (*a not uncommon situation!*). The main problem is to ensure that novices know which scale

to read (use the degree scale which is on the left, avoid the right hand scale which is "percent grade". The two scales look confusingly similar for low angle sights, but you can tell them apart by taking a high angle sight (45 degrees is 100%). Novices also need to be reminded to distinguish up (+) from down (-), and even experienced surveyors can muddle these when they get tired.

Conclusions.

Use the "one-eye" method when sighting with a SUUNTO compass. Where possible light the compass card by holding your hand in front of your cap lamp to reflect its light onto the card. If this is not possible (*e.g. you haven't got room to keep the helmet on*), then hold the cap lamp at least 10cm away from the compass. If you have to use a battery torch, keep it at least 20cm away from the compass and watch the compass card for any deflection as you move it in. If you do a lot of surveying consider buying one of the SUUNTO models with an internal light. Check your own gear to see how much magnetic effect it has.

Don't assume that because you are an experienced surveyor you will not make mistakes. We all have bad days and we all get tired. This should always be allowed for - when possible take both back and fore sights as a check for errors. When giving the instruments to another caver to use, make sure that they know how to read the scale, and which scale to read in the case of the clinometer or the "R" series of compasses. It is a good idea to have them make a few test readings on the surface before going underground and check these yourself. You should also have your instruments calibrated - but that is another story.

This article grew out of an initial posting about the "two-eye" problem on the "oz-cavers" e-mail list and the replies thereto, and then from further discussions at the Mapping Workshop at the recent ASF conference which in turn triggered the magnetic experiment with my lights. My thanks to all who contributed to those discussions.

Water Tracing Techniques

Ken Grimes

A number of different materials have been used to trace water movement. In the late 1800's, painted ducks were used in French cave systems. Bales of hay, wheat chaff, corncobs, and geese have been used in Missouri. Revenue agents in Tennessee poured 2,000 gallons of illegal whisky into a sinkhole and inadvertently learned that liquids from this point flowed to a spring supplying water for a local high school. Fortunately, better tracing materials are now available!

Extracted from "The Water Tracer's Cookbook" by Tom Aley & Micky Fletcher (1976), Journal of the Missouri Speleological Survey, 16(3).

*If you were capable of cloning your own body, and you were caught having sex with your clone,
Would that be called incest - or masturbation?*

Light Emitting Diodes

Their use in caves

Norman Poulter

Speleological research Group of Western Australia

Abstract

Light emitting diodes [LED's] have been around a long time. They are a bright, virtually indestructible source of "solid state" light. Low power consumption, coupled with being a "point" source of light, make them ideal for use in caves. I first reported their use in caves at the Speleovision Conference in 1983, although I had been using them to assist in photography, track surveying and surveying since the early 1970's.

Since that time, the technology of general-purpose LED's has changed little, although the introduction of ultra-bright LED's has opened the door to additional applications. The purpose of this paper is to re-emphasise the usefulness of LED's, and comment on recent technological advances.

Photography

One of my interests in caves lies in photographing their many facets, be they crystal clusters on the tip of straw stalactites, the unique fauna, or the splendor of entire chambers and passageways. It is the latter where LED's play a part. Quite often the cave photographer has to work with minimal lighting and assistance. How often has the photographer mislaid the mark where they wanted the model to "stand", or misjudged the correct distance to place a flash from the feature?

As outlined in the accompanying diagram, a large-scale photograph is set up with 10 flash positions utilising 4 people. The first objective is to establish the camera's

field of view [FoV] with the markers A and B so that they are visible to the camera [later hidden from the camera view]. By placing another marker on the camera, the photographer or assistant can determine where they are in relation to the overall scene by sighting any of the three points. Three "in-picture", and seven "out-of-picture" flash positions were chosen. Out-of-picture flash positions offer several advantages, the major one being that the flash can be elevated above a person's height to minimise "hot-spots".

When all positions have been worked out and marked, assistant F, E & D take their place at point 1. LED's that mark "in picture" positions can be hidden from the camera's view behind rocks or down cavities. The camera operator opens the shutter and moves to C₁, fires the flash, and then moves to C₂. To minimize body movement, F₁, E₁ and D₁ should fire almost simultaneously. After the flashes at C₂, the camera operator moves back to the camera so that the can be covered allowing movement to the second section of the photograph with subdued lighting. D₁ fires first, then moves to D₂ so that the position can fire towards F₂, at the same time as E₂ and F₂ fire. The shutter is then closed.

Surveying

During a 1995 field trip with the Canberra Speleological Society that involved surveying, John Dunkley and Chris Bradley of CSS liked the LED concept so much that they "did Remington" and "bought the company". Two surveying teams

each utilised three LED markers, the minimum number required. A member of the party would place the marker, being able to confirm that they were in line of sight simply by looking back towards the last LED. The sight taker found it easier to obtain a bearing by sighting into the point source of the light. By the time the two sightings had been taken, the "station placer" had returned to collect to overtake LED's, and left to establish more stations. Needless to say, efficiency would have been higher if more LED's had been available.

The circuit diagram [Fig 1] shows that a red and green LED has been used. This is where the markers directional capabilities are demonstrated. The orientation used by it is for red to indicate leading further into the cave, while naturally green shows the way out. The use of yellow LED's in place of red is not considered, as yellow closely resembles green, and so could lead to confusion.

"LED torches"

At the time of writing the original LED paper, I had speculated about their use as an "emergency" light source. The standard green LED has an illumination range of approximately 600mm, so that if a person "knew the cave", and kept their "nose to the grindstone" so to speak, they could ultimately find their way out of the cave, but only if the LED was the sole source of light.

In recent years, superbright LED's have appeared on the scene, unfortunately only available in the natural red colour. However, they are bright. Tandy have their 10mm Jumbo, while Radio Spares have the similar used Ultrabright. Small and light enough to be stored inside a caving helmet, the units have a peak illumination range of 10m over a period of 3 days. They are still bright enough to illuminate 1 m at 4-6 days. The switched version should be great for moving around during cave photography. Perusal of specifications indicate that the Radio Spares version is 3 time brighter (and expensive) than the Tandy version. However, initial tests in a large darkroom suggested that their illumination appears identical. Field testes in caves of the west coast and the Nullarbor has shown these "torches" to be a very effective form of illumination when they are the sole source of light.

Manufacture

Track marking LED's [fig1] are made with the LED's mounted as close as possible between the terminals of the battery holder

pointing out from the flat side of the holder. Before any assembly is undertaken, any moulding holes in the top of the holder are filled with epoxy. The object of assembly is to try and keep the LED's within the profile of the holder as much as possible. The legs of the LED's are trimmed, as they are enabling resistors. When trimming the LED legs, be careful that the orientation of the polarity is not lost, identified by a long and a short leg. If wired incorrectly, the LED will not work and may be "blown". Care must also be exercised when soldering the terminal to avoid melting the battery holder.

Once assembly is tested and complete, a strip of adhesive tape is wrapped around the periphery of the holder (*pushing it onto the cone of the LED*) and "potted" with a 5-minute epoxy. The epoxy is to keep the circuit insulated and give the collective assembly strength and protection. Shortly after the epoxy has "set" , and while it is still pliable, the tape is removed and the epoxy trimmed with a single edge

razor blade to remove all excess material.

Small, self-adhesive reflective markers (which can be numbered) can be attached to the flat areas of the battery holders to increase their visibility under low light conditions.

High brightness LED's are not recommended for use as LED markers (apart from the high cost) as their light output diminished rapidly as the battery power drains.

The LED torch (Fig 2) is manufactured in a similar fashion except that the LED is placed "inline" with the battery. Switching can be by a simple plastic strip inserted between the battery contact, or the installation of a micro-switch into the circuit. Once the micro-switch (which has had it's tabs modified to save space) is soldered onto the circuit, it is partially encapsulated in epoxy to give the assembly rigidity. Once again, self adhesive reflective makers can be attached to the battery holder (or the base of the LE) to increase their visibility.

Materials cited

Tandy standard green LED	#276-022		\$2.25/pair
Tandy standard red LED	#276-041		\$2.15/pair
Tandy high brightness red LED	#276-066	(not recommended)	\$3.15/pair
Tandy Smart Twin AA Battery holder	#270-382		\$1.75 ea

Panasonic Extra heavy duty AA Battery #R6NP [1.5v]

Tandy Jumbo super bright 10mm red LED	#276-086 [500mcd] (recommended)	\$7.95 ea
Radio Spares {Toshibs} Ultrabright 10mm red LED	#577-8522 [14,000mcd]	\$30.50 ea

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Poulter N	1984	<u>Light Emmitting Diodes. Their use in caves</u>	Speleovision Proceedings 14 th ASF Conference: 99-101
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Diagrams over the page...

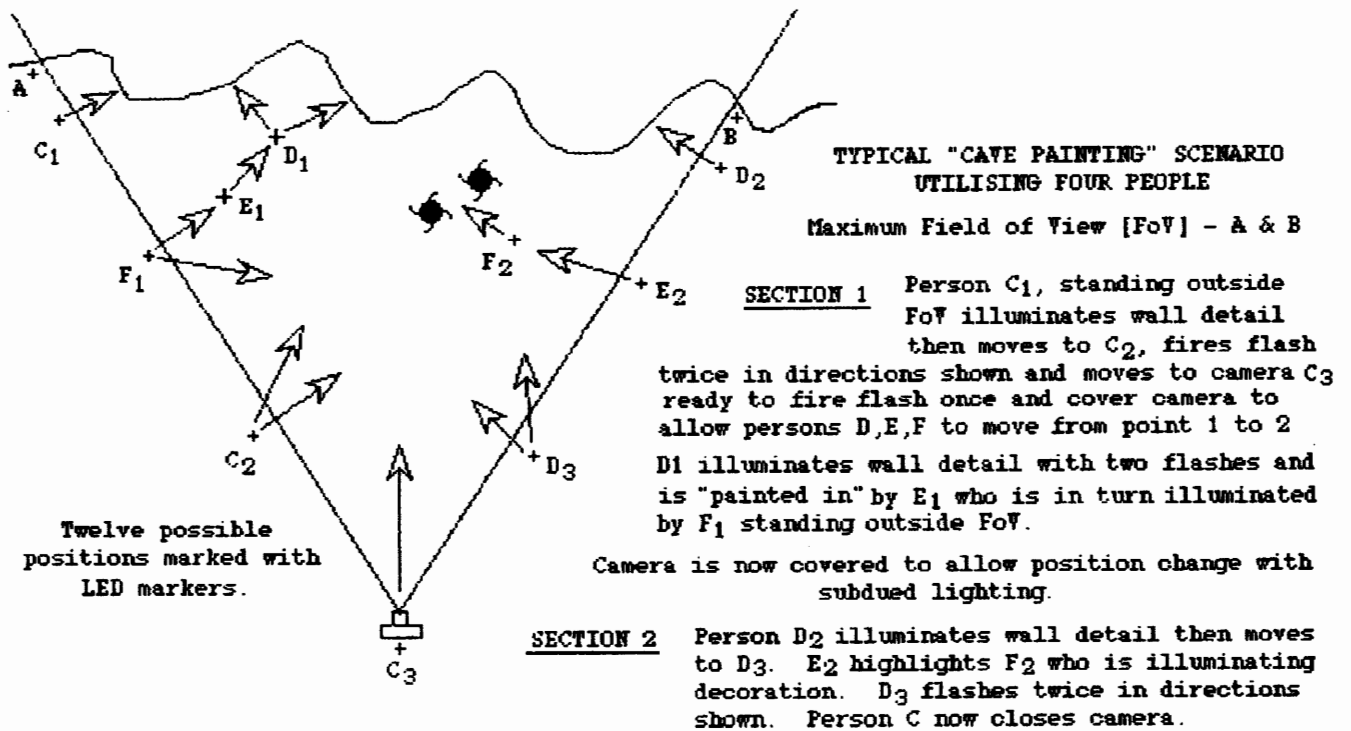
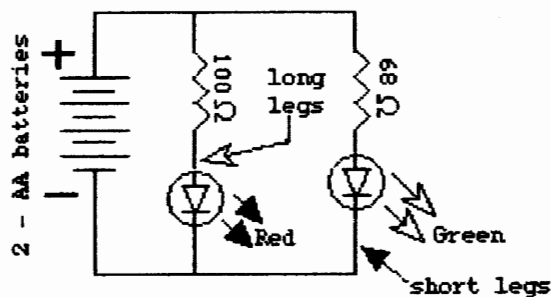
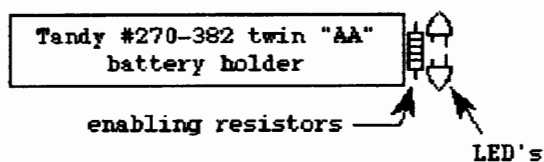


Figure 1

**LED MARKER**

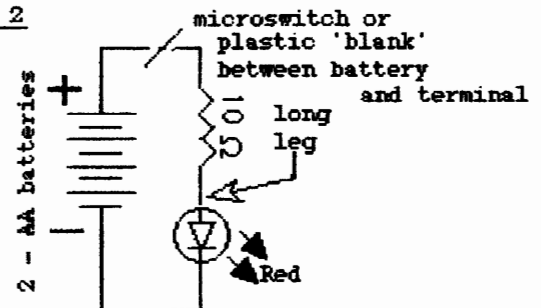
battery life > 5 days
weight with batteries 45.5 gms



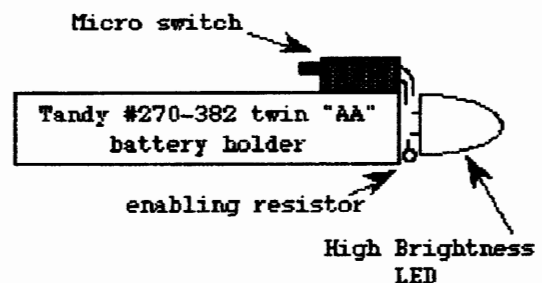
Battery terminals, connections
and epoxy not shown for clarity

LED Marker

Figure 2

**LED "Tandy" & "Radio Spares" Torch**

Peak brilliance > 3 days
battery life - 7 days

**High brightness LED "Torch"**

"If you were driving along at the speed of light in your car, and you turned your headlights on - What happens???"

-- Anonymous

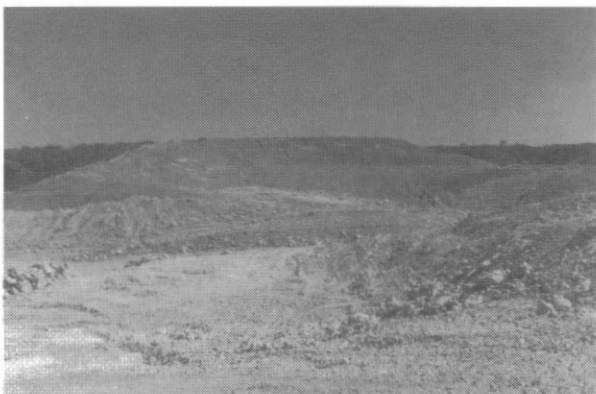
Quarry Cave - Exmouth

Darren Brooks

All photo's by Darren Brooks

A long, long time ago, in a place far, far away, called Exmouth, someone started a rumour that one day a marina would be built somewhere nearby. I had been hearing that story since I first visited the place, back in 1988. One day, not long ago, the rumour came true.

To build the marina, a quarry had to be excavated to supply the large quantities of rock necessary to for its construction. As one of the guidelines for use the site, any caves discovered had to be examined and assessed by someone of competence regarding speleological investigations.



The main Quarry Face. The face has been cut back to a stable slope & covered with soil. This face is visible from the main Rd into Exmouth.

The assessment was to be passed on to the Department of Environmental Protection (DEP) so they could make a final decision regarding the fate of any features. My name was supplied to the Department of Transport Marina Quarry supervisor who duly got in touch with me for the first time on 25/10/96 when excavations opened up a small cave in the bottom of a pit dug into the bottom of the quarry whilst chasing rock. This small cave was about 2m deep and 1m wide. It appeared to possibly be part of a larger, solutionally developed joint but large amounts of rubble had already entered the cave and further investigations were impossible. I felt that this cave was not of enough importance to justify halting quarrying operations and duly recommended that work proceed. It was made clear to me that excavations would only be continuing to the level of the bottom of the cave and no deeper.

I was contacted again on Friday, 8/11/96 by the supervisor who explained that a worker for the quarrying company, Limestone WA, had discovered a

natural entrance to a cave not far from a soon to be quarry face. At the site I found a worker not more than 20m from the entrance and he was in the process of packing a series of drill holes with explosives in readiness for the next mornings blasting. Upon examination, the entrance was found to be a 6m freehang to a rockpile of approximately 0.5m high. The cave is a chamber 15m by 19m and slopes up to the north away from the entrance. In places the roof height was up to 8m. In the southern, lower areas of the cave there were significant deposits of soil scattered with bones. The northern part of the ceiling was decorated with rootlets. The roof must be very thin in this area. Unfortunately, I was due to leave on a trip south when I was called in so could only make this cursory examination before departing. Outside the cave I spoke with the supervisor and some of the workmen. I was told a rock had been removed to make the entrance big enough to enter. The entrance was cave type, approximately 1m wide by 0.5m high. I was requested to make a report available as soon as possible. This just wasn't possible before the next Tuesday, the day after I would return from my trip. It was uncertain if the cave would still exist by that time. I stressed that the bone material was invaluable and should be preserved.



Looking North east over the entrance. The pit that nearly breached the cave can be seen in the background

Sometime on the Saturday or Sunday, 9-10/11/96, the supervisor, who held up the operations for a few days, asked a non-caving local to enter the cave and collect some of the bone material for preservation. This person scraped several kilograms of soil and bone material into some plastic bags and some surface bone material was also collected, along with faecal deposits and some

*If you were capable of cloning your own body, and you were caught having sex with your clone,
Would that be called incest – or masturbation?*

stalactites. He also reported to the supervisor that the roof looked extremely unstable and could collapse at any moment. I saw a rough sketch of the cave this person had made.

On the afternoon of Monday, 11/11/96, I entered the cave and made a detailed map and investigated for fauna. I found no strictly troglotic fauna. The areas where the bone and soil samples had been collected from were clearly evident. In one place a hole of about 400mm had been dug without bottoming out and bone material could clearly be seen in the sides of the hole. The roof of the cave looked very stable to me, and events later proved this impression to be correct.

On Wednesday, 13/11/96 I visited the supervisor to submit my report. In my report I stated clearly and unambiguously that in my opinion the cave should be preserved for further investigation of its fossil deposits. I also picked up the considerable quantity of collected material to take with me to the Perth Museum in a few days time.

On Wednesday, 4/12/96, I called upon the quarry supervisor to request permission to enter the quarry site to take a GPS location of the cave entrance. Permission was duly supplied and he accompanied me to the site. Upon arrival I found that although the original first blasting site had been abandoned, the new site was encroaching upon the cave and the face was within 20m of the cave entrance. Later at home I telephoned a contact to inform them of the latest developments at the quarry site.

The next day, 5/12/96, I was called by the supervisor and asked to come to the quarry. If possible, they wanted me to mark out the dimensions of the cave on the surface, and perhaps enter the cave and remove as much bone material as possible. Due to the fact the quarry face was now only 6m from the cave entrance, and even if work on the face was stopped immediately - the face would have to be sloped back for stability, and the cave itself would be breached. In his opinion, the cave was doomed. It was suggested that I could enter the cave and cover the fossil deposits with tarpaulins and when the cave was? Carefully? Quarried open, it would be easier to recognise the deposits and retrieve them. None of this was possible for me as I had unavoidable prior commitments.

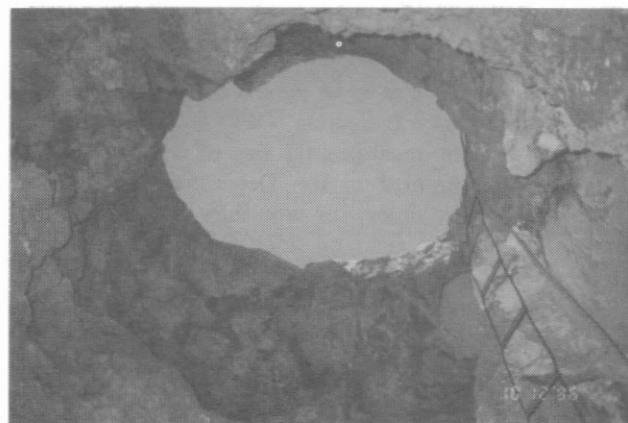
6/12/96 I was called at work by my contact in Perth and informed that according to the DEP the cave was now a protected site and that the boundaries of the quarry had been altered. The new quarry face was now outside the designated boundaries and therefore illegal. Shortly after this I was called by the supervisor and asked if I could come to the quarry the very next day and perform the tasks we had discussed previously. This wouldn't be possible for me until the day after. I informed him of what I knew about the boundaries of the quarry and he

told me he had not been told about this. Later in the day I was again called by my contact in Perth and told that a 'salvage' team from the paleo' department of the WAM would be visiting Exmouth on Thursday, 12/12/96 to retrieve fossil material before it was destroyed. After that the supervisor called me again. He told me his superiors ordered him to cease work upon the new face for an undetermined period of time.

I finally got to the quarry site on Sunday, 8/12/96 to mark out the dimensions of the cave on the surface. I met the supervisor at his office before proceeding to the quarry and he related to me that yesterday, 7/12/96, contrary to his directions to leave the cave alone, a worker from Limestone WA had used heavy machinery to rip up the caprock covering the entrance shaft. Upon arrival at the site I found the entrance had indeed been damaged and the 1.2m diameter entrance shaft was exposed.



Looking up out of the entrance before the entrance was "made safe" (a quote from one of the local limestone workers). An abseiling rope can be seen in the middle/lower right.



The same photo looking out the entrance after the entrance was "made safe"!

The edges were left in an extremely instable state with lots of loose rock now perched around the edge of the now funnel shaped entrance. I could also see some large boulders that had been knocked into the cave down on the floor. The supervisor asked me not to mention to anyone that there was still drilling going on at the base

"If you were driving along at the speed of light in your car, and you turned your headlights on - What happens???"

-- Anonymous

of the now illegal quarry face. At least I believe that's what he said. He may have said "the pans boiled dry and my eggs are burnt", but it really sounded like there was drilling going on against Dept of Transport orders. It also seems that if he did order the Limestone WA workers not to go near the cave then they may have destroyed the entrance out of spite (and may have tried to do more than just break the caprock, as we shall see later) and did so in direct contravention to an order by the boss.

The salvage party from the Paleo' Dept at WAM arrived on Tuesday, 10/12/96. I guided them to the cave accompanied by the quarry supervisor and a local with a video camera who was going to take some film of the cave and hopefully sell it to a TV station. A fair few rocks had to be removed from around the entrance and once the edge was tidied up it was decided that the two paleo' gents, the quarry supervisor and myself would enter the cave. The cameraman decided to hand the camera to me to do the filming.



The entrance after safety improvements. The Author is lowering a ladder into the cave, ready for the salvage crew

[Editors note:- Darren also commented "Godawful photo, I'm actually much more handsome than this!" but asked me not to print that comment! Sorry Darren, but I feel it's my duty as editor to publish all relevant comments...]

Once on the floor of the cave it was apparent that extensive damage had occurred from the nearby blasting. Large blocks of stone that had spalled off the sloping roof covered the soil areas with scattered bone material in the southern portion of the cave.

What was once about 20 square metres of soil had been obliterated to leave an area probably 3 square metres and this was difficult to access at best. There was no question of being able to remove the covering material with just four people available. Some of the blocks would have been over a tonne in weight. Parts of the ceiling in this area also looked cracked and unstable. It looked like an amount of material had also been dumped down the shaft. This has raised the entrance mound to at least a metre higher. The material was soil and small rocks with spinifex runners through it. It seems highly unlikely that this material could have come in with the caprock entrance material. The fossil material was

impossible to access. The cave has obviously been severely compromised with regards to stability in the lower ares but the main ceiling, as I suspected, was intact and didn't appear to have suffered to any degree. It was certainly stable enough to withstand the passage of machinery heavy enough to be used to remove the caprock entrance.

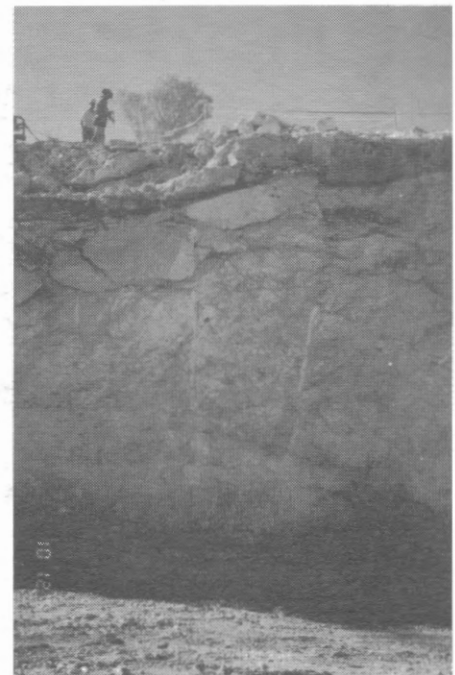


Looking south downslope to the entrance rockpile

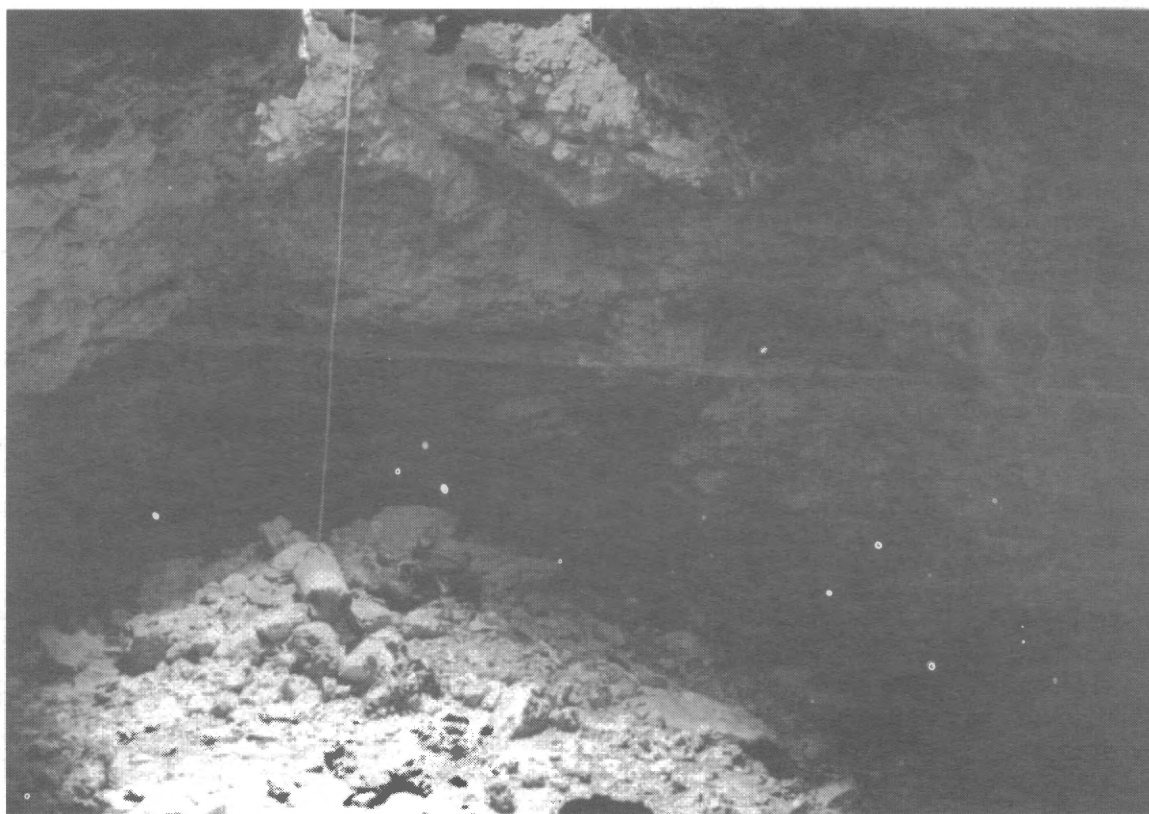
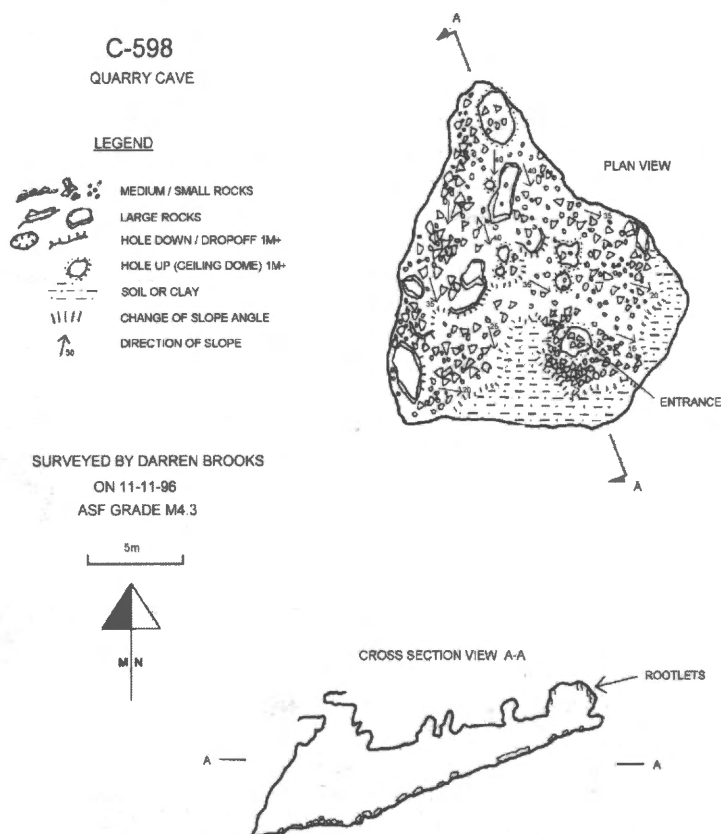
The next day, 11/12/96, a meeting was held with a rep' from the Dept of Transport. It was decided that a large rock would be used to re-cover the entrance to the cave in the hope of approximating the natural entrance. It is hoped this will return the climate of the cave to its previous condition.

The quarry face would filled rather than cut back so the chamber and entrance would not be breached.

On 14/2/97, I revisited the site to have a look at the cave entrance and quarry site in general. By this time the works had pretty much wound down almost to a stop, apart from a small face at the northern edge. The main quarry face had been sloped back and the floor levelled out. The cave entrance had been covered with a large boulder and some smaller ones and didn't look much like the



natural entrance. The entrance was also impassable and will need some rock removal to gain entry. To date (14/5/97) there has been some more rehabilitation work carried out. Interestingly, this has occurred only on the main slope. This is the slope that can be seen from the main road into Exmouth. Soil has been placed on this slope and, I have been informed, seeded with native plant seed so that vegetation will grow back when rain causes the seed to germinate. It still leaves an ugly scar on the hillside. Unfortunately, as the public was informed that the quarry would not be visible from the road. It is visible and can be seen from a stretch of road almost 10km long. As an aside, this is the same promise being made for the proposed Whitecrest/Cockburn Cement Ltd limestone quarry destined to be excavated a few kilometres to the southwest of the marina quarry. Not surprisingly, having carried out some troglofauna research on the proposed site, I found that I could quite easily and clearly see vehicles travelling along the same main road mentioned previously. Thus it would appear another empty promise has been made to the trusting and unsuspecting public. So, the rehabilitation carried out to date seems to be a disguise rather a true attempt at rehab'. "Out of sight, of mind", is the saying that comes to mind.



The cave, now known as C-599, Quarry Cave, still exists. Unfortunately not as it was originally discovered and with its value as a paleontological site severely compromised. It still remains as currently the only known site of its kind on the eastern side of the cape.

"If you were driving along at the speed of light in your car, and you turned your headlights on - What happens???
-- Anonymous

Advantages of caving in an area with heaps of small caves.

Author is anonymous, but denies being from Victoria!

No more false hopes and aspirations.

- Unless a total nut case, you will never hold false hopes of possibly finding the worlds longest or deepest cave. In fact, you'll never have false hopes of ever discovering Australia's longest or deepest cave.

Safety issues - It is difficult to get lost.

- For experienced cavers it is a simple case of keeping a cool head and remembering to crawl backwards. If a panic attack occurs and you forget which direction is backwards, your mates waiting outside can just grab hold of your legs and pull you out. In the larger caves, where your mates outside can't see your legs (*and this is rare*), just turn off your light and the daylight beaming in will point the way out.
- Light failure is rarely a problem. Just remember to look around for the light entering the cave from the entrance. This can be a little more difficult if caving at night. The moonlight is not as obvious as the brighter sunlight streaming in but experienced cavers can usually pick it out.
- If you get in any sort of trouble your mates on the outside can always grab your legs and pull you out again.

Exploration and Survey.

- You can honestly say you have seen every bit of the cave if you've entered it. Small caves require less effort to explore. You can often do a complete exploration without even entering the cave...just shine the light in and see it all from the outside. (This type of caving is most popular with those who practice minimal impact caving techniques.)
- No need to be weighed down with vertical equipment, struggling up to the cave and spending hours or even days in rigging the thing. In a small cave area its more likely to be a simple chimney down a two meter drop requiring no gear. As a bonus you can easily 'bomb' the 10 deepest caves in the area in an hour or two.
- You can completely survey several caves in a single weekend and still have plenty of free time. Just imagine how impressive it will sound when you tell your caving colleges at the next ASF conference that, over the past year, you have surveyed 236 caves while your Tasmanian colleagues are still surveying the same passage in Exit cave.

Other worthwhile advantages

- Cave gates are not needed. They tend to take most the cave space anyway.
- It's never more than a minute to the surface if you have to have a smoke, eat lunch or attend to important bodily functions.
- No need to join in the track-marking debate
- No fear of newspaper headlines blaring 'Cave rescue attempt now in 20th hour'

*If you were capable of cloning your own body, and you were caught having sex with your clone,
Would that be called incest – or masturbation?*

MULLAMULLANG CAVE 6N37, NULLARBOR, ONLY HAS ONE ENTRANCE.

Max Meth

An article 'Skeletal remains in Mullamullang Cave' written in 1991 by Bob Coops upon the finding in the cave of human 'Skeletal Remains' adjacent to White Lake raised the possibility of a second entrance for Mullamullang Cave.

Mr M Lofgren, of the WA Museum Anthropological Department wrote a report concerning this, in which he referred to the likelihood of another cave entrance closer to where the remains were found. Mr Lofgren expressed doubts that the victims would have ventured so far into the cave (*from the known entrance*) - and postulated the existence of a closer entrance to where the remains were found.

At the inquest, the Coroner said: "...The date of death was between 10 and 100 years ago. The cause of death is unknown but ... having lost what was likely to have been a very primitive light source, (they) lost their way in the darkness, ... and unable to escape from the cave, died." I am pleased to say that the Coroner did not hypothesise on a 'second entrance' in his findings.

Bob Coops in concluding, then asserted that "I tend to believe Mr Lofgren that there was another entrance to this cave some time ago, and maybe due to the elements it has sealed over."

I AM AMAZED THAT CAVERS HAVE NOT TAKEN ISSUE WITH THIS HYPOTHESIS.

Robert Wray, in 1992 took up the point but remained somewhat neutral. Wray stated, "If (*a second entrance*) did exist it must have been easily accessible for the Aborigines. The idea of an entrance closing is not ... totally unbelievable¹."

A reprint of Coops' article appeared in 'The Cavers Chronicle', thus giving the article tacit support from the editor of that publication, though no editorial comment was appended.

In the absence of other opinions in the caving literature, the foregoing opinion is given great credence.

However, a second entrance is totally **UNBELIEVABLE**. There can not possibly have been another entrance to Mullamullang Cave. (*This is not meant to be a question, merely the statement of a fact*).

Let us examine the situation. Some details are admittedly based on conjecture:

The coroner states that the deaths occurred from 10 to 100 years ago. This means 1891 to 1981. This means that only 100 years (*maximum*) is allowed for the obliteration of the 'second entrance'.

My personal feeling is that the date would be about 1880. In Coops report, the name of an Aboriginal that went missing about 1880 is actually given. " an Aboriginal named Buddon who had gone into the cave looking for water and never came out. ... the story ... dates back to the 1880's to 1890's". Why the coroner and others ignored this is a complete and utter mystery.

Details of this Buddon, corroborating Coops' account, were given to me by Mr John Carlisle in 1992 (*pers comm*).

Assume there was a second entrance. This in fact raises two problems, not one:

There is no known second entrance on the surface.

There is no known passage in the cave leading upwards.

Mullamullang is essentially a flat cave, with dips and rises that are mainly due to rock collapse processes. It is one thing to assume an entrance could be blocked on the surface, but the passage within the cave, leading towards the surface would still exist. There is no evidence of such passage within the cave. Nor is there any known recent infill or recent (*100 years old*) blockage in the cave in the vicinity of White Lake (*or anywhere else either*).

A breeze is evident in the main and side passages of the cave right up to the known limit. The breeze reverses direction every 12 hours on average. In each case the observed breeze blows toward (*or away from*) the known entrance. If a side tunnel led to a second entrance, a breeze, blowing toward the 'second entrance' would be evident in this also, however no side passage with such a breeze has yet been detected. If this passage does exist, but is very convoluted, the likelihood that the pair could have found and negotiated it is very problematical.

If one goes to the point on the surface of the Nullarbor, above White Lake, (*as others and I have done*), what does one see? Is there a huge doline, capriciously blocked off by nature, No!! Is there a very small doline or blowhole? No!! Is there perhaps a slight depression

¹But it is clear that Wray finds it hard to believe.

10cm deep? No!! There is not the slightest deviation from a uniform plane surface to be found, even within a 500m radius. This raises 2 points:

The time scale for this 'second entrance' to disappear is only 100 years. So are we to believe that in less than 100 years, an entrance that was large enough to enable 2 aboriginals to descend 100m to water table, has been blocked off with out leaving the slightest trace?

If this 'second entrance' is further away than 500m, then the original distance problem of Mr Lofgren comes into play, namely, 'how the victims would have ventured so far into this hypothetical cave'. The problem of the distance of the bodies so far from the entrance of Mullamullang cave, was the reason the 'second entrance' was invented in the first place.

The distance from White Lake to the (*one and only*) entrance is 1820m radial, or 2160m as the caver caves. There are at least 7 other lakes between the entrance and White Lake, so if water had been the object of the quest, the 2 victims had not been very observant.

It is in fact relatively EASY to traverse the 2.1km from the entrance to where the remains were found. Apart from the initial descent at the entrance, and the descent at White Lake, the rest of the way is rather flat and easy going. And the strong breeze that blows along the main tunnel, can be followed, almost like walking toward a light.

The Coroner described the light used by the Aboriginals as "a very primitive light source". I think a few things need to be said about this.

'Primitive' does NOT mean that the light source was ineffective or feeble in some way. Aboriginals used fire brands, (bunches of sticks held together), and they were very skilful in their use, and could keep them burning indefinitely.

'Primitive' does NOT mean that the lights were unreliable, These men doubtless had the ability to make fire from scratch, given a supply of wood, even in total darkness.

And a modern electric torch can easily be rendered 'primitive' or worse, by dropping it etc or the globe or battery becoming defective. As such, no single light source should ever be depended upon as the sole means of finding one's way.

In going 2km into the cave, the time required would have been fairly great, and it seems that the pair exhausted all the firebrands that they had.

One problem that may well have doomed the pair was the reversal of the wind flow. Smoke (and the flames) from their firebrands would have been blown by the strong breeze that blows through the cave. And the steady direction that the smoke took, in following the breeze, would be a comforting sign as to which direction

led back to the entrance. People using electric torches would perhaps be unaware of this.

The pair may well have ventured to the first lake near Oasis Valley, to get water then headed for home following the breeze. There is actually no written or oral evidence that Aboriginals knew of the existence of water in this cave. It seems probable that this ill-fated expedition was an exploratory trip. The pair presumably carried enough firebrands to get out safely. But at some point, perhaps while drinking, maybe the breeze changed direction. The breeze in the cave (*as in all caves*) can change direction swiftly, then continue to blow just as strongly in the opposite direction. So, they then followed the breeze further into the cave, and ran out of light. They had no intrinsic way of telling which way led to the entrance.

Remains of firebrands were found near the bodies, though not by the investigators in 1991. The fire brand remains were found in 1964. E G Anderson on the first documented entry into the cave, conducted a survey of the main passage on 9.1.1964, and wrote in his report, "A few pieces of wood and charcoal discovered near section 34 remain unexplained." And section 34 was located at the top of the rockpile that leads down to White Lake, which is near where the remains were found.

It happened that Anderson ran out of time and that his survey ended just past White Lake. Both bodies were found within 30m of section 34. So there is no mystery as to how the pair got to where they were found. They walked there from the main entrance, using firebrands as torches.

And this undoubtedly shows that the bodies were in the cave in 1964 already. Many people including Anderson and myself, have no doubt walked very near the bodies in the period between 1964 and 1991, but missed seeing them.

IN CONCLUSION:

I believe the above disproves the existence of a second entrance to Mullamullang. I do believe that theories regarding cave evolution and morphology should be based on observations of nature, not on hypothesis.

POSTSCRIPT:

I will now point out, that the 'single entrance' of Mullamullang Cave does in fact have at least 4 discreet cave entrances within the single doline!

On the generally flat surface of the Nullarbor Plain, there is a collapse doline, in which is the entrance to Mullamullang Cave. This doline is 80m long 50m wide and 21m deep at the deepest point. Its walls are mainly vertical to overhanging cliffs, but walk access is possible.

*If you were capable of cloning your own body, and you were caught having sex with your clone,
Would that be called incest – or masturbation?*

The central portion of the doline is a 'saddle' or 'col' of rock that has only collapsed about 2 or 3m below the surrounding plain. To the south and north of this are 2 distinct portions, the 'north' and 'south' dolines. And these contain 4 separate entrances, where there is access to underground passages. These 4 caves have previously all shared karst number 6N37, but according to numbering convention, they should be given individual numbers. HENCE:

South doline (10m deep) contains 2 caves:

6N1330 '**Refrigerator Cave**', an irregular opening in the collapsed blocks of limestone on the west side of the south doline. This leads to in excess of 50m of passages. This cave does not form part of Mullamullang cave, there being no known physical connection. NOTE: This is not a blowhole, although air does issue from the entrance, as it does from EVERY collapse doline on the Nullarbor. There has been no survey of this cave, though I have drawn a sketch map of a portion of it.

6N1331 '**South Col Cave**' named (by me) because it extends from the south doline beneath the 'col' of uncollapsed rock in the doline. And it does connect to the 'Everest' of Nullarbor caves. This cave starts at the deepest part of the south doline, but it does not head south. Instead it heads east then north and connects to the main 'Mullamullang Cave' of the north doline. This is therefore a part of Mullamullang cave.

There has been no complete survey of this cave. The best map of it I 'unearthed'² only recently. It is a sketch map done by Alan Hill on 3.1.1967. The finding of the sketch map precipitated the writing of this article.

Alan Hill died on 21.6.1972. He was of course editor of the book 'MULLAMULLANG CAVE EXPEDITIONS 1966'.

The 'north doline', (21m deep) also has 2 caves:

6N1332 '**unnamed cave**' leading from a small hole in rockpile has a 23m long cave, which extends under the rock pavement area on the West Side of the doline. The entrance to this is about 2m short of being under the main overhang. Therefore this cave is technically not part of Mullamullang cave. There has been no survey of this cave.

6N37 '**Mullamullang Cave**' which starts from the point where one first proceeds under the main overhang of the north doline. Part way down the initial entrance slope, in the twilight area, the main passage is 'blocked' by many huge boulders of 5m or more in length. These do not prevent access, but present vertical 'pits', which must be negotiated. In the area above the boulder choke is a passage that leads to the 6N1331

entrance in the south doline. This passage is a part of Mullamullang cave as it commences well beneath the overhang of the north doline.

Beyond the 'boulder choke' area the main passage then continues for 4.3km to the Dome. This is the furthest distance from the entrance that the cave attains.

About 12km of passages in this cave have been surveyed, though a great deal more is known, and awaits survey. Persons interested in this survey work are encouraged to contact CEGSA.

Away from the doline of Mullamullang cave, the surrounding Nullarbor Plain is not exactly flat and level. There are 2 noteworthy deviations:

(1) There is a drainage depression surrounding the doline. This is defined as the area that is currently being actively eroded and is 190 x 160m and 3m deep. Beyond this there extends a yet larger depression, the boundary of, which is ill defined. But its size is closer to 500 x 300m (possibly even larger) and this adds another metre or so to the overall depression depth. This huge depression indicates that the Mullamullang doline has existed for a long period of time, probably at least 10,000 years³. Enough time, in fact, for rainfall to cause the weathering of this huge depression.

And the material has been washed into Mullamullang cave. The main north passage as far as the Southerly Buster, over 300m from the entrance, is a streamway, active after heavy rain. This part of the cave is currently filling up with debris that is washed into the cave. At the Southerly Buster there is at present little more than 1m of passage height.

(2) There is a succession of ridges with intervening claypans. In the vicinity of Mullamullang many ridges show a NE to SW trend. And Mullamullang Cave, underground, follows this trend. In a NE direction 2.9 and 3.3km radially from the Mullamullang entrance are Camp One Blowhole 6N73 and Dome Doline 6N519. Neither of these provides any human access into Mullamullang cave, nor does this appear to have ever been the case. They are more than 1km radial from White Lake, the location of the finding of the skeletal remains. If there were further dolines or blowholes anywhere near the line of Mullamullang Cave they would surely have been found years ago?

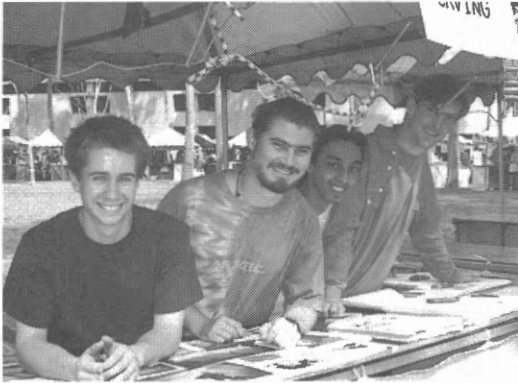
The author would be happy to receive comments on the above article.

²CEGSA records contain things that have been closeted away for years.

³ Pure speculation on my part.

Macquarie University Caving Group new members drive a huge success!

Wayne Shelley President MUCG 97



Macquarie University Caving Group had a hugely successful New Members drive at the recent University Orientation Week 3rd-5th March 1997 [Eds note:- Well - it was recent when I received the article! Unfortunately, it was one day late for the last issue....sorry Wayne...]. Following on from the big year in 1996, we managed to attract 93 new members for 1997. The high profile of 'adventure sports' is likely to have been a factor in the popularity of the club this year and last. We like to think that each and every new member that we train goes on to become a responsible caver !

Plans for this year include:-

1. A 40-member trip to Bungonia for beginners weekend - quite a logistical nightmare.
2. Trips throughout the year to Bungonia, Jenolan, Wee Jasper, Wyanbene, Yarrangobilly, Tuglow and Colong Caves
3. Numerous canyoning trips to the Blue Mountains
4. To host Speleosports on May 3rd at the Uni Gym
5. To host the Cavers Annual Dinner the same night. and finally....
6. A two week trip to Waitomo in New Zealand in December. Plans for this are well under way.

The club has something happening almost every weekend of the year now. The rapid regrowth of the club has been solely due to a small but dedicated bunch of old and new members over the past 18 months.

Macquarie are also now on the web... The page is updated fairly regularly and the address is:-

<http://www.mq.edu.au/~musa/mucg>

Photos are:-

Ken Anderson, Tim Moulds, Anselm Goh and Charles Gallagher manning the O'Week stall in March to drum up membership

and...

Charles Gallagher and Jackie Doyle demonstrating abseiling to new members.

Photos by Wayne Shelly



SRGWA Report

SRGWA has been busy since our last contribution to the Australian Caver in 1993. The Group is now an incorporated body, membership has grown and activities extended beyond the "traditional" areas of the Nullarbor Plain and Leeuwin-Naturaliste Ridge.

Members on two separate occasions assisted university Environmental Science students in relation to their Honours projects relating to caves. Copies of their respective thesis have been lodged with the ASF Librarian.

Much needed conservation work in the Leeuwin-Naturaliste Ridge continues, especially in Calgardup and Crystal Caves. The dig in the eastern side of Giants Cave continues in conjunction with Cavers Leeuwin [CLINC]. A gate has now been installed at the entrance. There is at least another four vertical metres of digging to go before there is any likelihood of a breakthrough.

Norman Poulter was involved with photographic work associated with the recently opened CaveWorks museum/laboratory near Margaret River and literature/postcards at

Ngilgi Cave. Some small caves were numbered in the Jerimiah Hills near Kununurra as Robert and Norman Poulter motored by during an extended holiday in 1995. They also participated in the CSS expedition to the Northern Territory for several days during the same period.

There have been two expeditions to northern Vietnam and another is scheduled for New Zealand this coming Christmas. A trip to central-Java is in the planning stages for mid-1998.

A short excursion to the Nullarbor led by husband & wife team Wayne Tyson and Heather Jefferies during 1996, led to surveying and trackmarking taking place in Sentinel and Anzac Caves. Unfortunately, someone removed the trackmarkers from both caves shortly afterwards although new sets of markers are due to be re-installed in the near future.

The Group was successful with a \$16,000 research grant application to the Gordon Reid Foundation, which will shortly enable the purchase of two dedicated data loggers [temperature, humidity &

CO₂] and associated computer equipment. The loggers will initially be used for monitoring the atmosphere of the Ngilgi tourist cave.

Norman Poulter conducted two trips to the Nullarbor Plain in early 1997 which led to the discovery of two significant fauna caves and the doubling of the number of known caves on the Roe Plain. One of the Roe Plain caves led to the water table and the discovery of two new aquatic life forms.

Negotiations are currently underway to have both caves designated "research sites" and gated to preserve their pre-discovery environment. A visit to Weebubbie Cave resulted in a report being presented to the Department of Land Administration accounting SRG's view of the October rockfall and likelihood of further falls.

SRG members also attended the "secret" ASF Conference at Quorn. Despite the high registration fee and relatively low attendance, the Conference was a sociable, laid-back affair.

CQSS Update

Peter Berrill CQSS President

With membership scattered between Brisbane and Mackay, membership is at a low level, even for us aging locals. A number of members are still keenly involved in exploring and documenting the Mitchell-Palmer karst area of Cape York, with the 10th expedition set down for later this year. The information gathered will be used to update the national park proposal.

CQSS is 30 years old in July this year, and we are trying to organise a CQASS – UQSS reunion/celebration. Tentatively, this will be held on the weekend of the 27th & 28th of September this year (QLD school holidays). All those interested please contact Peter Berrill ASAP on (009) 225320 Work, or (009) 342870 Home, or PO Box 6343, Rockhampton Mail Centre, Q4702.

If you know of any past members no longer involved in caving, please contact them – all are welcome.

Because of our decision to close the books on Mt Etna, there is nothing to report.

"Oh what a feeling!"

"If you were driving along at the speed of light in your car, and you turned your headlights on - What happens???"

-- Anonymous

South Australian Speleo Council 1996 Annual Report

Tim Payne
President SASC

This year has been one of consolidation, with many long-term members of the council taking a well deserved rest from the front line. The council has been instrumental in increasing the cooperation between cavers in SA, and numerous cross club training, research and mapping programs have been conducted.

A report on cave crickets at Naracourte, which was funded by the National Parks & Wildlife, has been finalised, and a considerable amount of work has been by a number of subcommittees. In particular, the training and safety subcommittee, and the cave management subcommittee. Organisation of the 1997 conference is proceeding, details of which have been distributed.

In November 1995, the Environmental Resources Development Committee, which is a standing committee of both houses of the SA government, delivered its findings on the Sellick's Hill Quarry Cave. This report was critical of the actions that led to the blasting of the cave. The government was required to comment within 3 months on these findings, but to date has not commented. The matter has apparently been before Cabinet several times, the main concern being the issue of compensation for the quarry owner. Apparently a protocol has now been developed between the Department of SA mines & Energy, and the Department of Environment & Natural Resources, but the nature of this agreement has not been released.

The relationship between SASC and the CDAA has often in the past been turbulent, and sometimes confusing. This year has consolidated the relationship between the two organisations with agreements developed to involve and inform the other organisations in issues or negotiations which are relevant to it. Principle amongst these agreements was a landowner liaison policy which has been developed over a number of years.

Over the next twelve months, the SASC will continue to bring local cavers together, and present a consolidated front to landowners and government departments to provide advice, secure better access to cavers, and to ensure that the caves are protected.

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Contributions

If you are reading this bit, then maybe your thinking of contributing something yourself? Yes, am I correct?
If so, then contributions can be sent to me
Via email at deanm@netspace.net.au

or sent via 3 1/2 inch floppy disk. Preferably Word for Windows, RTF, or ASCII formats. Pictures can be in most formats, but Jpegs, Gifs, Bmp's, and Tiff's work best for me.

It is also preferable if you can send me a hard copy of your material so I know I've got it right in the electronic transfer.

If you have no computer, then typed, scribbled, hand written, carved in rock slabs, courier, or carrier pigeon - who cares, as long as I get it!

Of course - you'll have to bribe me with money if you want it to appear in print...

Send contributions to:-

Dean Morgan,

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deanm@netspace.net.au

Highland Caving Group's 40th Anniversary.



Who? Highland Caving Group
What? 40th Anniversary celebrations
Where? Bungonia State Recreation area
When? 6th-7th September 1997
Why? To bring as many members and clubs
together to reminisce about old times,
..... and to dream of the future!
How? Caving, canyoning, walking etc. during the day.
BBQ, Spitroast and entertainment at night!



To get an idea of the number of people attending, please let me know the approximate number of people that will be attending from your club as soon as possible, thanks.

Yours in Caving, Brett Moule