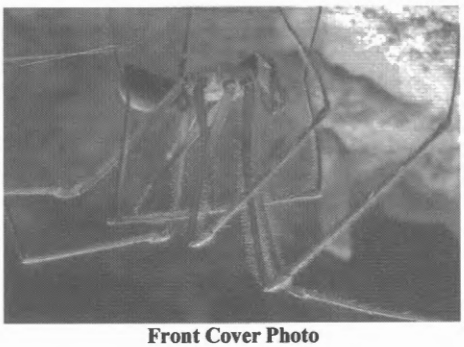
AUSTRALIAN CAVER

JUNE 1998

Australian Caver

The Journal of the
AUSTRALIAN SPELEOLOGICAL FEDERATION INCORPORATED
PO Box 388, Broadway NSW 2007
http://rubens.its.unimelb.edu.au/~pgm/asf

Issue no 144 – June 1998



Front Cover Photo
Hickmania troglodyte, Male
Bradley Chestermans Cave, Ida bay
[See page 16]

Editorial:

It may look thinner, and it may feel thinner. I'm sure that if you got out a micrometer and measured it, you'll find that it *is* in fact thinner. If you put it on a pair of scales with a previous issue, I've no doubt you'll even discover it weighs less than previous issues. But, and here's the important bit...if you count the numbers of words in this issue compared to previous ones, you'll find it to be the same!

Hi, and welcome to the first of the "anorexic" Australian Cavers. As predicted previously, the Australian Caver budget has been reduced *(significantly!)* and to meet costs, I've got the option of making three issues a year instead of the four you are currently getting, or continuing with a quarterly journal, but finding a cheaper way of doing it! Personally, I think a quarterly journal is important to the ASF, so to cut down printing costs, this issue has been trimmed from 36 pages, down to 24, all without sacrificing any of the content. Hey, you can't complain about not getting value for money now, even if you don't like the new "waif" look!

First of all though, a big "thanks" to Sherry Mayo for producing and editing the last issue for me while I was off. I hope you all realise what a champion effort she did! I just dumped it on her by contacting her and asking her to do it for me all from scratch. She came up with the entire content, format, printing and publishing - all without a whimper! Admittedly, I think she did too good a job - in that it totally eclipsed any issues I have done, and I feel somewhat inadequate now - Thanks Sherry...

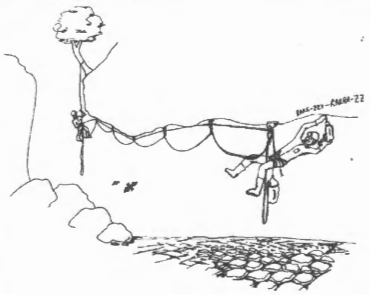
How about all you members start paying double the membership fees you are now? That way, we could afford to print full colour issues of Australian Caver, and you'd all get to see the brilliant photos in glorious colour like I do. Especially this issue's cover shot by *Stefanicus Eberhardicus*, which is truly awesome in full colour. If Stefan ever passes through your caving area, then makes sure you collar him and get him to flash some slides at a club meeting. You won't be disappointed, that's for sure!

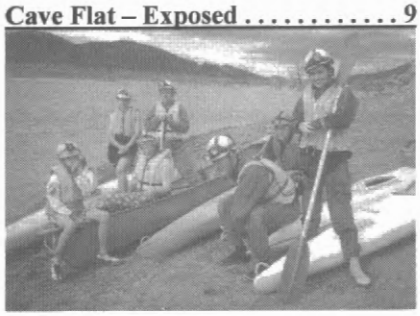
Dean Morgan
Editor

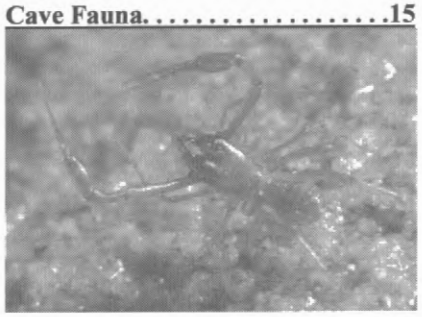
Contribution to Australian caver should be addressed to: --
Australian Caver Editor

T
[redacted]
Em

CONTENTS







Letters To The Editor...

Don't be conned

At the ASF Council meeting held in January 1998l, there was a 12 month moratorium imposed on "bolt laddering" (ie the use of a continuous line of bolts to climb up to unexplored parts of a cave)*[See page 3 for more details]*. Whenever this sort of thing happens, do you, like me, think, "Why are they trying to stop exploration?" Then do you think, "What would they have done in their day?" Finally, do you think, "Would there be any caves for them to impose moratoriums on if there had not been cave explorers in the first place?"

Could it be that those suggesting or imposing restrictions are the people who have already made their own discoveries and want those to be the last discoveries ever?

I suggest the cavers of today ought not allow themselves to be conned. Go looking for the new caves (they're still out there) and experience the high that comes from genuine exploration. Naturally, you will employ the least intrusive methods possible, just as I'm sure they did in their day. If you still find yourself under attack on "minimum impact" grounds, look for the ulterior motive and ask yourself, "Do these people keep out of sensitive caves?" Then ask yourself "Who are the most frequent visitors to such caves?

Peter. J. Ackroyd
27/3/98

Production Team of Australian Caver

Wow! As I slipped last issue from its envelope, I saw that we'd come of age. Congratulations and thank you. At last we have a magazine I can ever so casually leave lying around, and non-caving folk (and family) will pick it up and comment.

A quick flick through its pages will dispel any lingering visions of cavers as a disjointed gaggle of unwashed weirdos, and we might at last be able to rest from defending our interest from unflattering misapprehension.

Aussie Caver last issue had a truly eye catching cover, its content was balanced, informative, interesting, funny, and totally devoid of bitching!

Yep, I think we're gonna make it...

Regards
Kerry Hamilton
C.S.S
4/4/98

Cave Lights & Airport Security

Planning for the 1996 National Speleological Society Inc Convention in Salida, Colorado involved, among other things, how to get my caving equipment to the Convention. Since I

planned to fly, some of my equipment could have posed a problem for airport security. The most critical item was the fluorescent helmet-mounted cave light. Costing $250US, it is an expensive investment, and I did not want it in my suitcase where it could be lost, or damaged. My plan was to put the light and a battery in my carry-on luggage so that I could demonstrate it if necessary. Nothing else, other than everyday items, was packed in this carry-on luggage. This seemed to work, and I had no delays at airport security at Richmond. Maybe they were not checking very closely.

After a late night, the packing for the trip home did not receive the same thought as before. After walking through the metal detector at the Denver airport, I noticed my carry-on luggage was still in the machine, and the security agent was calling for assistance. They asked that I step over to a nearby table.

By this time, several other security employees were at the table and opening my bag. I offered to help find the items of most interest to them. One inspector declined, saying they were required to maintain control of the bag at all times. She eventually found the cord to the fluorescent cave light and started to pull on it. I asked her not to pull too hard. With a little effort, she untangled the cord. I volunteered information that this cave light was a very rare, high-tech light, used to provide a lot of light from a moderate sized battery and that only 23 were made. The entire group agreed that none of them had ever seen anything like it. I continued to explain that it was used to provide a very efficient and bright floodlight when caving. "So your a spelunker?" they asked. I responded that we prefer to be called cavers.

As various items were discovered, they asked me about each one. "What is this timing device?" he asked. "Just my travel alarm." I replied. I offered to demonstrate the cave light, but the supervisor asked me to wait. He was using his hand-held two-way radio to call headquarters. I heard him read off a list of items found in the baggage, "Batteries with wire and additional batteries, a sealed plastic box with wire, timing device, bottle with clear liquid."

By this time, several more security personnel were present, for a total of seven, including a female plain-clothes officer who may have been the supervisor's boss. She watched closely without comment.

As I turned on the switch to the fluorescent cave light, I said "Watch this amazing demonstration." I then pressed the start button for several seconds and then released it. Nothing happened! It then occurred to me that the battery was not connected. I explained this to them.

Clearly unimpressed, one agent asked, "What is the bottle for?"

"I believe it is water, let me confirm that by drinking some," I replied. I took a long squirt from the bottle, with no obvious harm. I was thirsty. The agent, apparently still not convinced, removed the cap and sniffed the contents.

I then took the battery wire in one hand, and the wire to the lamp in the other, holding it up so that everyone could see. As I started to connect them, the security supervisor said an emphatic "Stop!" Another conversation over the radio ensued, and I was told to connect the wires. After connecting them, I turned the lamp around so people could see the power on green LED indicator. I also pointed to the other three LEDs used to measure the two AC circuits and the low battery warning light.

I then pressed the start button and with the release, a bright light came on. I directed the light towards each person so they could appreciate it's brightness.

"Why do you have this light?", they asked. "Caves are really very dark, and as I have gotten older I so not see as well in low light. This high-tech fluorescent light helps to offset the effects of aging on low light vision," I responded. At that point, the supervisor seemed to understand and implied he had the same problem. He said they had finished with me, and that I could go. One agent helped me get everything packed, commenting that after this, she was ready for the FAA exam. I thanked everyone for their courtesy and professional conduct.

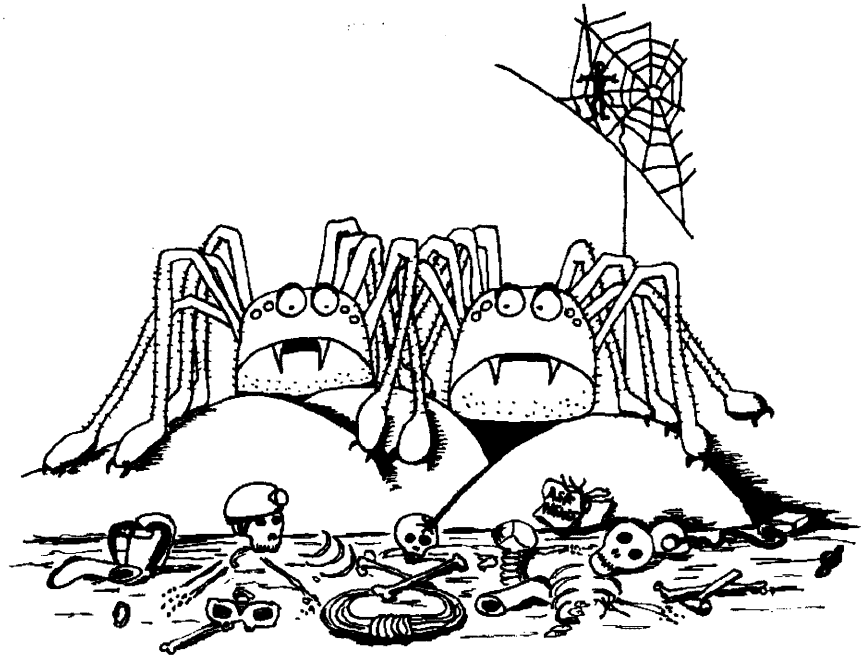
John. M. Wilson
Reprinted with permission from "Letters" – NSS News, November 1996.

BOLT LADDERING IN CAVES: A DISCUSSION PAPER FOR ASF MEMBERS

By Arthur Clarke

Introduction:
During 1997, the issue of bolt laddering in caves was discussed at numerous meetings of the Southern Tasmanian Caverneers (STC), the "new" Tasmanian caving organisation which has been recently formed from the amalgamation of the three former southern Tasmanian (Hobart) based bodies: SCS, TCC and TCKRG **(Clarke, 1997).** This bolting technique was being used as an exploratory ascending method to aid-climb avens and cave walls to gain access to potential leads in the upper reaches of the *Growling Swallet* cave system in the Junee-Florentine karst of southern Tasmania.

The present *ASF Code of Ethics and Conservation (1992)* and *Minimal Impact Caving Code 1995 (MICC)* make reference to bolting in caves in relation pitch heads (and re-belays) for SRT exploration, but does not specifically relate to bolt laddering as an vertical caving exploration method. Due to the difficulty for STC members in gaining complete consensus on this matter (between the cave conservation versus cave exploration concerns), it was decided by STC that the issue should be brought forward to the ASF Council meeting in January this year (1998), in order to ascertain whether ASF could suggest a policy direction.



Might be lean pickin's 'round here for a few years whilst this caver moratorium is on...
Cartoon by Stephen Bunton

ASF considerations and the interim moratorium on bolt laddering:
The concern regarding bolt laddering as an acceptable means of cave exploration was brought forward to the Australia Day weekend (January, 1998) ASF Council meeting in Melbourne and was included as part of my lengthy ASF Conservation Commission report **(Clarke, 1998)** and also discussed at ASF Executive meetings held during the same period. There was some considerable discussion at ASF Council where representatives from caving clubs around Australia brought forward varying points of view. To some extent, it was seen by ASF members that the issue was a bit of a "hot potato" and furthermore, there had been insufficient notice or background information for ASF to bring forward an immediate response.

An ASF resolution was brought forward to the effect that Arthur Clarke be commissioned to write a discussion paper for circulation to all ASF members (via *Australian Caver*) and then depending on responses and feedback, submit a report to the next ASF Council meeting on whether there was a need for a specific ASF code or policy relating to the practice of bolt laddering. It was further suggested that, in order to formulate this present discussion paper, some immediate feedback could be sought from the email List Subscribers to the various local, national or overseas caving List Servers, such as "*Ozcavers*". In addition, a motion was put forward and carried, stating that: *this ASF Council agrees to a one year moratorium on bolt laddering until the next Council meeting (at Rockhampton, January 1999).*

The electronic media feedback from ASF members, ASF member clubs and cavers generally, was initially quite limited, but eventually "picked-up" and in total I have now received about 80-85 email responses from subscribers to the Australian-based "*OZCAVERS*", North American-based "*CAVERS DIGEST*" and the Tasmanian *"STC List Server*", plus personal emails. Before summarising the input from this feedback for this discussion paper, I think its probably appropriate to briefly outline what bolt laddering entails and the methods currently being deployed in Tasmanian caves.

Bolt laddering as a vertical exploration method in caves:
Bolt laddering does not refer to the placement of anchor bolts at pitch heads or re-belay points for descent of a cave pitch. Bolt laddering refers to the aid climbing technique of scaling avens or cave walls, and is summarised in the paper by **SUSS (1998)** as the exploration method *"...where the ascent of a climb is done exclusively, or virtually exclusively, using anchors drilled into the rock."* This cave exploration technique was outlined in *Speleo Spiel* **(March-April, 1997)** where John Hawkins-Salt, describes the ascent of an aven in the "*Necrosis*" section of the Junee-Florentine cave system: *Growling Swallet*, and states that *"...Bolt laddering is the technique of building a ladder out of bolts, to climb a rock face, or in this case an aven, in the hope that something significant will be found at the top."* **(Hawkins-Salt, 1997.)**

This bolt laddering exploration method involves the use of either a hand-drill or a portable, cordless (battery operated), percussion drill to place a vertical line of bolts (with hangers) on a cave wall. In the method described by John, a climber (on dynamic rope belay) at maximum reach, drills 40-45mm deep, 8mm wide holes and inserts an 8mm x 40mm Dynabolt, plus a hanger plate with a "Quick Draw" (double karabiner and short sling) and an Etrier (short 5 rung rope ladder). Then by standing up in the Etrier as high as is possible (and safe to do so), the process is repeated and a second Etrier is attached to the

next (higher) bolt and hanger **(Hawkins-Salt, 1997)**. In some instances, these longer drilled bolt holes can be substituted by drilling shorter 15mm holes and using a Skyhook **(Hawkins-Salt, 1997)** or can be "missed out" altogether by the placement of chocks or "friends" in suitable cracks, then attaching appropriate slings and krabs. In his verbal descriptions of bolt laddering, John states that providing you have enough helpers (prepared to stand around in the cold, holding belay ropes and "twiddling their thumbs") and enough gear (including spare batteries), then a caver/climber can scale a wall at an average rate of 10-20m per hour! John also states in the *Speleo Spiel* article that the *"...Dynabolts and hangers can be easily removed and re-used several times. On muddy rock it is no trouble to grab a handful of mud and cover the holes, ERASING ALL TRACES of your desecration."*

The practice of bolt laddering has the subject of considerable debate in North America for almost a decade now, particularly because the main proponents were rock climbers or cavers with a rock climbing background who were setting up aid-climbs on cave walls. Ian Houshold ("*Ozcavers*") says that some original ladder routes (in US caves) had turned into virtual underground climbing gyms, complete with climber's chalk and over 150 bolts in a single wall. Although this is highly unlikely to occur in Australia, in his article to *Speleo Spiel* early last year, John Hawkins-Salt said: *"...with a sport climbers' disregard for ethical or environmental considerations, I have rushed into this practice with little consideration/ discussion of possible impacts."* (John does not attempt to hide the fact that he owns and manages the Hobart Indoor Climbing Gym where STC members and other cavers are given discounted rates to brush up on their climbing skills and practise their SRT techniques on his climbing walls.)

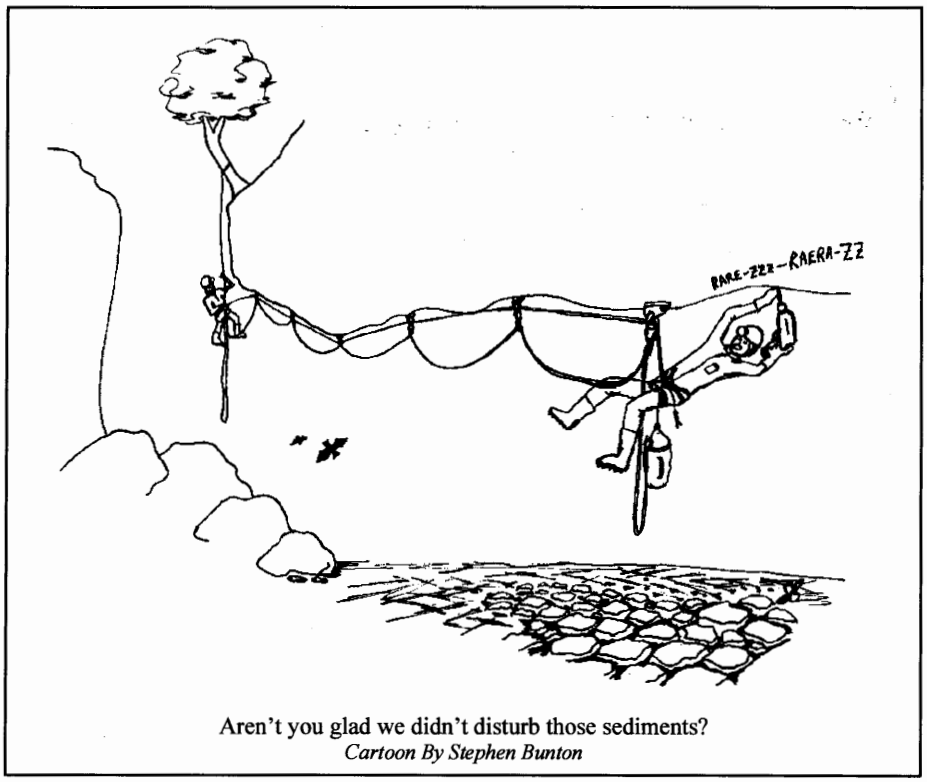
The usual alternate method to bolt laddering: the traditional or standard method for scaling cave walls or avens (where free-climbing or use of climbing chocks is not possible or practical), involves the use of a scaling pole, which is carried into the cave. In some cases, where a promising vertical lead is near a cave entrance or in a cave where "humping" a load is not a problem, a pole of wood can be carried in; in other instances, a telescopic aluminium or light metal pole is usually deployed. In either case, one of the usual standard 9m (30foot) or 15m (50foot) long, flexible, "Electron" wire rope ladders is attached to the top end of the pole, along with stabilising ropes (held by cavers to hold the pole steady) and a pulley system for the lifeline belay rope, while a caver ascends the ladder, in the manner as described by **Butt & Morgan (1995)** and **Lyon (1983)**. Although usually less damaging to cave walls, this scaling pole technique has been often viewed as being cumbersome and awkward, plus the fact that the length of vertical access reach is usually limited to the length of the caving ladder.

The pros and cons of bolt laddering:
Judging from the 80-85 responses received via email, there is roughly a 50/50 split between those in favour of bolt laddering in caves and those against. Some respondents have likened the advent of bolt laddering to the introduction of SRT into caving; where at first there was considerable opposition and then subsequently the technique became the norm. It has been suggested by several cavers that bolt laddering can be accepted as an exploration practice, provided there is valid geomorphic evidence or survey mapping from within the cave or from surface trogging to support the need to search for higher leads. Jill Rowling (from "*Ozcavers*") has suggested that prior to deciding on an aid climb in an aven or up a cave wall, cavers should first consider sending up a helium filled balloon with a remote controlled camera to check out the potential of any proposal.

Other respondents have given bolt ladders the green light, on the condition that any proposal is previously discussed at a club meeting and that it fits in with that club's exploration policy and objectives for the particular cave or cave system. Similarly, it is generally agreed that any bolt laddering project should only be taken on after the consent or permission is obtained (perhaps in writing) from the respective relevant cave or karst management authority or land owner. Most cavers agree that bolt laddering is going to be a "no-no", if the lead involves crossing over or climbing up speleothems or other fragile deposits including bone deposits and clastic sediments. In the submission from SUSS **(1998)**, they suggest that where practical, it might be better to commence bolt ladders from the top of a scaling pole, rather than from the cave floor. Virtually all those in favour of bolt ladders agree that intermediate bolts should be removed after completing a climb and the holes or casings filled in or disguised as best as possible, to minimise the visual impact, though SUSS state that bolts can be simply *"...shorn off"*.

Importantly, when the upper level lead has been exhausted the climbers who perform this bolt laddering should complete (and publish) the survey of their high level lead (ideally before commencing another similar project), so there should be no reason for future cave explorers to do a repeat climb. If a significant high level route is discovered and it is deemed necessary to leave a fixed rope or ladder in place, then these obviously need to be subject to regular audits and replacement in the same manner as any other fixed climbing aids in caves.

Many of those respondents against the practice, have suggested that we should not be using any climbing aids (or other caving devices) that impact on/or physically alter the cave's natural structure, especially in a manner that defaces a cave wall and does something to that cave's integrity and "naturalness". [However, some of these cavers could accept the practice of bolt laddering, provided that all other (free)-climbable, "crawlable" and "walkable" leads have been pushed and explored to their limits.] Opponents to the practice maintain that powder dust from the drill holes is often difficult to get rid of and that you can always see where the holes have been made. It has also been stated that there tends to be a significant impact on the cave floor where the belayers or other assistants have been standing around (and shivering), sometimes inadvertently dropping refuse (lollie wrappers and cigarette butts have been mentioned).



Aren't you glad we didn't disturb those sediments?
Cartoon By Stephen Bunton

Several respondents have suggested that prior to commencing a bolt ladder project, there should be a thorough geomorphic assessment of the cave and the surface karst, and use of surveys to check whether it may be possible to locate another higher level route or another surface entrance and then abseil down to the desired location. Kelly Miller *("STC List Server")* raises the question in relation to bolting up avens: whether there is any likelihood of a surface breakthrough or possibility of alternate routes? Perhaps it may be worth waiting for future technological advances in cave exploration, considering the exploits of *Garth Vader* and *Drean Gorgan* and their use of *"Anti-Gravity boots"* in caves of the Junee-Florentine in the year 2017:AD? **(Morgan, 1997).**

Jeff Butt *("STC List Server")* states that in the USA, it is now illegal to take a power drill into caves at *Lecheguilla* (New Mexico). He adds that in the nearby *Carlsbad Caverns* upward exploration (by bolt laddering) is permitted by only one approved cave-climber who has submitted an acceptable proposal and been accepted to do a particular climb.

There can be little doubt that this technique of bolt laddering will enable cavers to extend the present known limits of a cave system. In highlighting the importance and relevance of ascending vertical sections of *Growling Swallet*, John Hawkins-Salt mentions that the earlier discovery of high level fossil sections has enabled cavers to bridge across to parallel stream systems and he believes there are still further possibilities in different parts of this cave. However, the discovery of these parallel sections in *Growling Swallet* during earlier exploits in this cave was achieved by "natural" means with adventurous cavers either free-climbing or using scaling poles. But perhaps the question then rises: on what basis do you determine that the means justifies the end? And..... there is still the question: should ASF develop a policy covering bolt laddering and/or amend or make additions to the *ASF Code of Ethics* and *Minimal Impact Caving Code* to include specific mention of this technique?

"Oh! Pity I haven't paid up my ASF public liability insurance."
[Editors note – Yes, I know this cartoon appeared last issue. Unfortunately, the caption was left off. Apologies to Stephen Bunton]

Several respondents opposing the practice of bolt laddering have suggested that upward ascents of cave walls or avens might disturb bat roosts or other cave fauna, as well as, or in addition to breaking pristine speleothem deposits that are sometimes found in upper "fossil" level relict karst passages. One of the overseas respondents from *"Cavers Digest"* commented that if your caving code permits you to impact caves as lightly as possible for the sake of exploration or research, then you have discretional license to interpret how much is too much, and each case is different. Brien Chartier (another overseas respondent) suggests that bolt ladders should not be attempted by novices, or those cavers without climbing experience and recommended the more frequent use of bat-hooks and cam hooks and passive and active protection as well as use of pitons (suggesting titanium instead of iron). However, Sherry Mayo *("Ozcavers")* makes the point that the old fashioned aid-climbing methods using pitons etc. can be just as destructive to a cave wall. Perhaps the use of hooks can prevent a piton or bolt placement. There have been other comments about the use of bolts in caves and the problem of ending up with "bolt farms" at pitch heads.

In regard to the present ASF Code of Ethics and Conservation and MICC:

In both the *ASF Code of Ethics and Conservation (1992)* and *the Minimal Impact Caving Code 1995 (MICC)* there are several sections that relate to exploration methods in caves and use of bolts. In Section 21 of "General Cave Visitation" in the MICC, the reference to bolts is assumed as relating to anchor points for rigging (SRT and/or flexible "Electron" ladders) at pitch-heads or re-belay points, and states that *"...bolts should only be used where natural anchors are inappropriate."* In the Section on "New Cave or Extension Explorations" it states: *"...CAVE SOFTLY!"* You would have to wonder how using a noisy, vibrating percussion drill fits into this code!

In their submission on bolt laddering in caves, SUSS **(1998)** have adopted a generalised approach to the impacts caused by cave exploration, deliberately avoiding specific mention of bolt laddering, and have suggested a number of clauses that can be inserted into the MICC Section dealing with "New Cave or Extension Explorations". In a personal email response to me, Chris Norton suggests that rather than ASF changing or amending any of its codes or guidelines, cavers should simply abide by the regulating requirements, provisions or policies laid down by cave or karst management authorities and land owners and comply with their access conditions. He suggests that cavers (and ASF) should let these managing authorities take on the responsibility for determining whether caving activities will permit cave exploration techniques such as bolt laddering.

In the submission on bolt laddering by SUSS, they suggest that there is no need for ASF to have a plethora of codes to cover all aspects of exploration caving etc., unless these relate to something quite different like cave diving. Perhaps SUSS members should consider that bolt laddering is a different type of caving to normal cave exploration methods. In the same way that cave diving is undertaken by cavers who are divers, it could be equally said that bolt laddering is done by cavers who are climbers!

Some questions and considerations for ASF members:

In one of her "*Ozcavers*" postings, Jill Rowling raised three issues: technical feasibility and safety issues (is the appropriate technique being deployed?); legitimacy (does the owner of the cave allow it to be bolt laddered? Under what circumstances?); and ethics (should bolt laddering be considered as a method of cave exploration?).

Below is a summary of many of the questions and considerations surrounding this issue and I would welcome responses in order to complete my report and recommendations to the next ASF Council meeting in Rockhampton. Responses can be sent direct to me: snail mail at 17 Darling Parade, Mt. Stuart, TAS. 7000, or via email: arthurc@southcom.com.au - or via "*Ozcavers*" etc. and/or to *Australian Caver*.

- Is bolt laddering of avens or cave walls an acceptable method of cave exploration?
- Is it always going to be a technically feasible and safe practice?
- Does ASF need to have a policy or some guidelines related to bolt laddering?
- Do ASF members believe the present ASF Code of Ethics and MICC are adequate to deal with this issue of bolt

laddering under the relevant sections on bolting?

- How much damage are we willing to inflict on the cave environment (and accept) in the pursuit of our cave exploration or other speleological activities?
- Should bolting projects require prior approval from a full club meeting or the Executive/ Committee members of that club?
- Should bolt laddering be permitted in all caves, some caves or only those caves that are not found in Cave Reserves or National Parks?
- Should prior permission be obtained from the relevant karst management authority or land owner?
- Should the results of surveys from bolt ladder climbs and upper level explorations in caves be published prior to the commencement of another bolt ladder project?
- Under what circumstances should bolt laddering be accepted?

(a) as last line of exploration, when all other exploration leads are exhausted?
(b) when the geomorphic evidence and/or mapping surveys indicate the likelihood of a high level route?
(c) at any time that a high level lead looks likely?
(d) at any time provided that access to an aven or cave wall does not involve movement up or across speleothems and/or other fragile deposits?
(e) at any time, provided that bolts are eventually removed, holes are plugged and evidence of drilling (powdered rock) is removed?
(f) for search and rescue purposes only?
(g) never at all?

In conclusion, I would like to leave *Australian Caver* readers with the following statement, being part of a long email from Bruce Rogers, one of the list subscribers to *"Cavers Digest"*.

He writes:

"There seems to be a rising trend in the cutting edge of the US caving community that either you free climb the area cleanly without any permanent anchors to attain that elusive upper passage . . . or you simply pass it by. After all, it's somewhat comforting to know that there's still a little unknown area in even the most well-travelled caves. And it's always better to leave something for the succeeding generations to deal with.

So, either the caving community polices its own ranks and insists that bolt placement be minimal and selective for truly worthy goals only after all other routes have been exhausted . . . or the Feds or other owners of the caves will take matters into their own hands and prohibit bolting in Federally- or other corporate-owned caves; the private cave owners would probably follow suit as they aren't usually crazy about some yahoo hanging their butts out over thin air while needlessly bolting up marginally secure walls & ceilings."

Acknowledgments:

This discussion paper would not have been possible without the input from attendees at the recent ASF Council (in Melbourne) and numerous other cavers from around Australia and overseas who responded to me via email, either through their List Servers or personally. Following are the names of respondents (with number of responses in parenthesis). I sincerely apologise if I have omitted anyone!

"STC List Server" - Jeff Butt (2), Jol Desmarchelier (3), John Hawkins-Salt (7), Kelly Miller (3), Dean Morgan (3), Stuart Nicholas (1), Dave Rasch (3), Di Sward (1).

"Ozcavers" - James Campbell (1), Evalt Crabb (2), Jol Desmarchelier (2), Ken Grimes (1), John Hawkins-Salt (4), Richard Hopping (2), Ian Houshold (3), Sherry Mayo (1), Kelly Miller (1), Stuart Nicholas (1), Chris Norton (4), Jill Rowling (3), SUSS (1), Martin V. from SSS (1), Keir Vaughan-Taylor (1), Al Warild (1), Rauleigh Webb (1), Lyle Williams (1).

"ACKMA List" - Kent Henderson (1), Ernst Holland (2).

"Cavers Digest" - T. Evan Anderson (1), Brien Chartier (1), Barbara Graham (1), Bruce Rogers (2), David Schang (1).

"Personal responses (including verbals)" - Peter Berrill (1), Jeff Butt (1), Bob Cockerill (1), Evalt Crabb (1), Jol Desmarchelier (2), John Dunkley (1), John Hawkins-Salt (3), Ernst Holland (1), Ian Houshold (4), Stuart Nicholas (1), Chris Norton (3), Jill Rowling (1), Rosie Shannon (1), Rauleigh Webb (2).

References:

Butt, J. and Morgan, D. (1995) "Caving Safety 1: Course Manual" ASF-CLAG (Tasmania). 92pp.

Clarke, A. (1997) "The new Southern Tasmanian Caverneers" Australian Caver, **139**: 4-5.

Clarke, A. (1998) "Cave and karst conservation concerns in Tasmania - 1997/1998" *(Unpublished Conservation Commission report to ASF Council, Melbourne, January, 1998.)*

Hawkins-Salt, J. (1997) "Bolt laddering, how to, should we?" Speleo Spiel, **301**: 9-10

Lyon, B. (1983) "Venturing Underground: the new speleo's guide." EP Publishing, Wakefield, England. 160pp.

Morgan, D. (1995) "Garth Vader and Drean Grogan in THE WRATH OF BUTTMAN". Australian Caver, **142**: 31-33.

SUSS [Sydney University Speleological Society] (1998) "Bolt Laddering: submission on behalf of Sydney University Speleological Society" (Unpublished paper for private circulation, distributed by Chris Norton on behalf of SUSS.)

ASF MEMBERSHIP YEAR - FINANCIAL YEAR & Subscription to AUSTRALIAN CAVER.

By Garry K. Smith

This small article has been written to provoke thought, stir discussion (or end discussion) on the subject of ASF 'Membership' and 'Financial Year'. You can be the judge of that.

For a number of years now I have wondered about the relationship between 'Membership' and 'Financial Year'. This led to a search of the Administration Handbook, (Constitution and By-Laws) for dates nominating these periods. The only date found was that in the 'By-Law on Membership Fees' which gave the 30th June as the date for payment of fees.
It appears that the other dates (ASF Financial Year and Membership Year) are not defined in the ASF's Constitution or By-Laws. After discussion with a number of people, it was determined that the ASF works to a 'Financial Year' of 31st August and a 'Membership Year' coinciding with the calendar year (1st Jan. to 31st Dec.). This all sounded very confusing to me.

It appears that the clubs must pay Members fees to the ASF by the 30th June. This gives the treasurer until the 31st August to tally the ASF books. Then the Accountant and Auditor go over the books in the next few months and the final Treasurers report is presented at the January ASF Annual General Meeting. So what you say! Yes, I agree that this is all straight forward. The next part becomes a little bewildering to me.

The 'Membership Year' begins on the 1st January, so clubs are either 6 months ahead or 6 months behind on paying their membership. I am assured that all clubs are 6 months behind on paying membership and they only pay for the members they have at the 30th June. This explains why the ASF Treasurer sends out the notices around April-May to remind clubs that the membership fee is due and amount to be payed per member. It seems to me that the 'Membership Year' and the due date for 'Membership Fees' should be the one and the same to save confusion. This would not require an amendment to the Constitution or By-Laws, however it is something which I personally think should be added, to save confusion in the future.

RECEIVING AUSTRALIAN CAVER
The other confusing thing is period for receiving copies of 'Australian Caver'. Does it begin from 30th June when 'Membership Fees' are due or from the start of the 'Membership Year', 1st January?. I am still a little baffled on this one, however I am assured that a person payed up for a years membership will receive the four issues. This is great news, however prior to the take over by the present editor/s (who are doing a fantastic job), there was a period where the production of Australian Caver was fairly sporadic and members were not really assured of receiving four issues. Lets hope that future editors of this voluntary organisation can keep up the regularity and high standard achieved by the present editor/s.

PART YEAR MEMBERSHIP
The joining of a new club member part way through the year and having them registered with the ASF has been a grey area in the ASF constitution. In the past most clubs just accepted a new person into their club and hold payment of ASF fees and registration (for that person) over to the next financial year.

I am led to believe that an amendment to the Constitution at the AGM in January 1998 will alleviate this problem as a person joining a club part way through the year may register as a 'New First Year Member'. This would be confirmed with a nominal fee (currently set at $5) paid to the ASF. This person would be then covered by 3rd party insurance, however they would not be sent copies of the Australian Caver. To get current issues of this publication they would need to pay a subscription fee of $5 per issue for the remainder of that financial year. If the 'New First Year Member' wanted the issues of Australian Caver published after their joining date, then a lump sum cheque for membership and magazine subscription should be sent to the ASF Treasurer with an explanation note. If that person remained a member of the club into the next ASF financial year, then the club must register that person as a 'Member' and pay the appropriate yearly fees to the ASF.

REFERENCES FOR ASF MEMBERSHIP & FEES
I quote the following text from *the ASF Administration Handbook*
Section A- Constitution & Incorporation, 'Division 2 - Membership & Associates' (No. 15),
"Provision may be made in the by-laws for the quantum and time for payment of membership fees and each member shall comply with those provisions."
Section B - By Laws, 'By-Law on Membership Fees & Councillors' (No. 3),
"Each corporate member shall pay the Federation a standard membership fee for each of its individual members by 30 June in each year, unless the Corporate member is entitled pursuant to this by-law to pay some other (or no) membership fee in respect of an individual member, in which case by 30 June in each year the Corporate member shall pay the Federation that other (or no) fee for that individual member.
Section E - Commissions & Ad Hoc Committees, 'Newsletter Commission' (No.1),
" To edit, print and circulate a quarterly newsletter to members of member societies in respect of whom a capitation fee has been paid and to other subscribers.'

22nd Biennial Conference Australian Speleological Federation 1999

CAVE QUEENSLAND

- Taking Caving into the next Century with Fun, Unity and Fellowship -
HOSTED BY:CENTRAL QUEENSLAND SPELEOLOGICAL SOCIETY INC
DATE: 4 - 8 JANUARY 1999
VENUE: YEPPOON RECREATIONAL CAMP - CAPRICORN COAST CENTRAL QUEENSLAND

This will be the last Conference of the 20th Century.

Make sure you fill in your registration form early! (Included with this issue of Australian caver)

ORIGIN OF THE NAME OF THAMPANNA CAVE Western Australia

By Peter Ackroyd

There is often discussion about some of the odd names Australian caves seem to receive. A few of these, especially for the caves of the Nullarbor Plain, are derived from aboriginal names for the cave or some nearby feature. Thampanna Cave [6N-206] is one of the latter. My understanding is that Thampanna Cave was named after the nearby Thampanna Rockhole.

The rockhole was recorded by a Western Australian surveyor by the name of Turner, during his 1885 theodolite and chain survey of the rockholes of the state. On 11 August 1885, Turner, with his aboriginal guides, reached Thampanna Rockhole from Yalganimirra Rockhole. I'm assuming, although Turner's field notes don't specify it, that the Rockhole names were Turner's transliterations of the names the guides used. If this assumption is correct, the cave name should be pronounced phonetically: ie as it is spelled, rather than "Tamparna" or Tampanna".

As an aside, the person responsible for drafting the 100,000 topographical map (1981) which covers this area appears to have made an error in relation to plotting the positions of Yalganimirra Rockhole, Thampanna Rockhole, Yelangurra Rockhole and probably rockholes to the west of these. When I was at Thampanna Cave in April/May 1994, I recomputed Turner's original survey data and found that the true positions of these rockholes were almost a kilometre in error. Using my newly calculated positions, I was able to navigate to within a couple of hundred metres of the rockhole using my Garmin 75 GPS. By spreading out with other members of the party, we quickly located the rockhole using local indicators. This was done for each of the three rockholes mentioned above. Thampanna Rockhole was relocated (and confirmed using Turner's description) by this method on 25th April 1994.

Photon Micro-Light II

By Alex Kariko

The photon light is a compact torch, powered by 3V. '2016' lithium watch batteries driving a high output light emitting diode (LED). The blue & white lights require two '2016' batteries. It is about the size of a standard, beer bottle crown seal, (approximately 40x20x6mm). The lithium batteries are claimed to last between 90 and 120 hours of continuous use.

I first saw one on in December 1997. I thought someone was playing with a laser. If you wanted more information about the lights, then point your computers Internet browser to http://www.photonlight.com, or write to "Bryan Avery Marketing 9255 Hwy. 36 Blachly, OR 97412 USA." I ordered two over the Internet, one red and one white, paying by credit card. Two weeks later they arrived by post. A month later the item appeared on my credit card invoice. It worked out at $AU24 for the red one and $AU36 for the white one, at an exchange rate of around $AU1.56 per $US1.00. Not cheap, but you pay around $AU20 for a mini-maglight that takes a single AAA cell which gives only about 4 hours light. That is around 22 AAA batteries for equivalent light duration.

I have tried the lights at Jenolan and at Buchan and I use it regularly at work when delving into the innards of computers. The Micro-light II can be turned on either by squeezing the flat sides together, or by activating a small slide switch. They throw a 45deg cone of soft even light that is reminiscent of a carbide lamp. The white LED gives a bluish light that is bright enough to read by. I have occasionally used it to read a book in bed so as not to disturb my good lady. I just turn it on, rest it on my forehead and it illuminates the book nicely.

Everyone who saw the light in action underground agreed that it gave more than adequate light for safe navigation. The light is small enough to be comfortably held in the teeth, leaving the hands free for climbing or attending to gear. My third light source, the white Micro-light II, now goes onto a shock cord lanyard around my neck with my whistle and small Swiss Army knife.

Servicing is simple. Four screws hold the case together, the batteries slip out easily, but make sure you keep the instructions as reassembly can be a little tricky if you dislodge the globe. One of my kids left my white one on and when I found it several days later, the batteries were dead. I bought two new batteries at McEwans for $AU2.95 each and installed them easily once I found the instructions. Waterproofing is simplicity itself. Open the case and after liberally coating all components with silicone grease, cram more grease into any space remaining then reassemble.

I'd give them five stars if they were a bit cheaper, but for now

★ ★ ★ ★

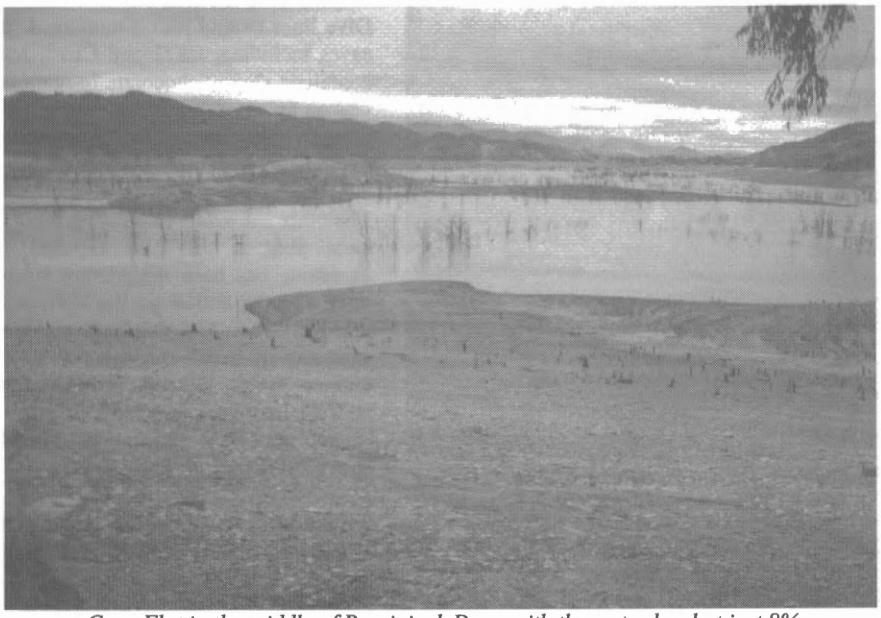
SUMMARY

Product Name: Photon Micro-Light II
Sales: Bryan Avery Marketing
9255 Hwy. 36
Blachly,
OR 97412
USA.
Internet http:\\www.photonlight.com
Light Source: High output LED.
Colours: White, red, yellow, blue.
Power source: 2 x 2016 3V. Lithium Watch Batteries.
Price: White with lanyard: $US24.00
Red with keyring: $US16.00
Batteries: $AU2.95 at McEwans & other large hardware outlets.
Postage: $US6.00
Battery life: Claimed 90-120 hours continuous per set.
Payment: MasterCard & Visa, by phone, mail or email.

CAVE FLAT - EXPOSED

By Garry K. Smith
[All photos by Garry K. Smith]

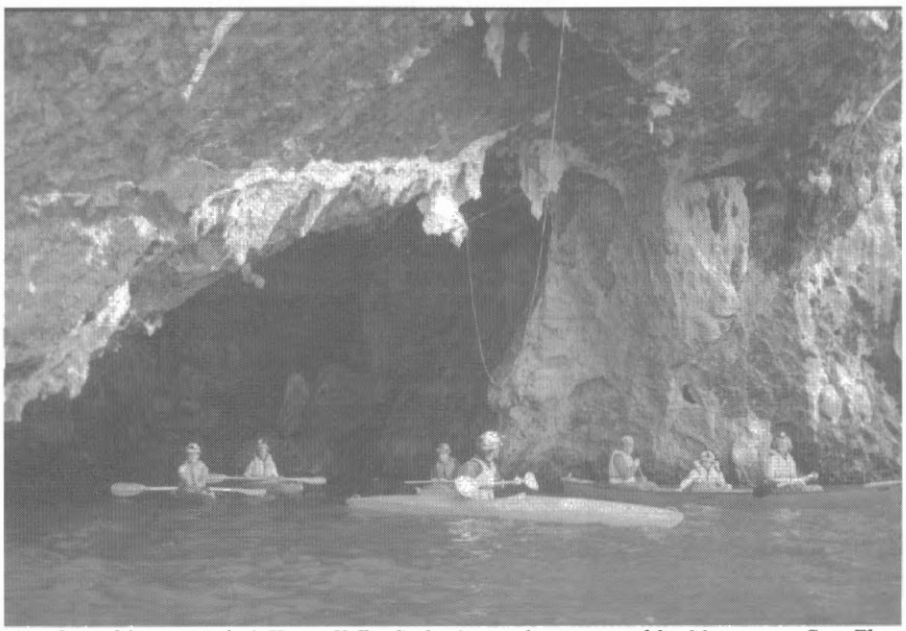
During Easter 1998, nine members of the 'Newcastle and Hunter Valley Speleological Society' (often referred to as NEWCAVES to save the tongue twister), visited Cave Flat, a karst area located 34 km south-west of the town of Yass in Southern NSW. So what you may say!. Well, this place has been under water almost continuously for about 70 years. I suppose the name is rather misleading as the Karst area is actually a small hill, however it was flooded after the completion of the Burrinjuck Dam in 1928. You see the hill is actually a very small island supporting just a few trees when the dam is at 100% capacity. No wonder the name in the 1985 ASF Karst Index is misleading with the name "Cave Flat" when the locals refer to the area as 'Cave Island'.



Cave Flat in the middle of Burrinjuck Dam with the water level at just 8% during Easter 1998

Our visit was prompted by the prolonged drought which had seen the dam level drop to just 8% of capacity. This corresponded to a water level some 36.1 metres below the 100% capacity mark. Consequently the vast expanse of dam foreshore looks like a lunar landscape as the water edge is in places several km from the nearest vegetation at the high water mark. The Island is now connected to the foreshore and vehicles can be driven out along a broad ridge of land onto the karst area.

the possibility of hypothermia prompted us to go prepared with canoes. So with a convoy of vehicles, Subaru (4WD), Landrover, Camry (2WD) and trailer, we set out for the Island. Mind you, had it not been for one large bank of soft powdery earth and the trailer with canoes behind, the Camry would have made it all the way under its own power. Oh for the advantages of a 4WD and a towrope.

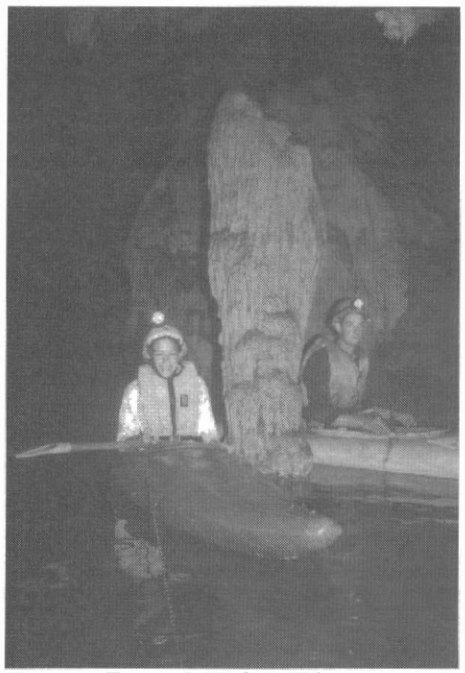


Members of the Newcastle & Hunter Valley Speleo Soc. in the entrance of the Main cave at Cave Flat. Easter 1998

The Main Cave is now exposed at the base of the large cliff on the Southern side of the Island, however the water level dictated the use of canoes or dinghies to reach it. The only other option was to abseil down the cliff into the deep water, then swim into the cave. The thought of treading water in caving gear and

Our group of nine cavers must have looked real freaks trogged up with the usual caving gear as well as buoyancy vests and canoes. The first sign of this cave is very impressive with dive lines dangle down the cliff face and into the cave along the roof. These continue through out the cave as the area is used by cave divers for advanced penetration training. So the sight of float bottles 30 odd metres above our heads on the cliff face was rather impressive.

Anyway we canoed around and into the large entrance chamber which contains several sizeable formations. Deep water extended to the rear of this chamber for about 30 metres. At this point several canoes were dragged up a rocky slope on the right hand side of the chamber, then though about 50 metres of damp earth floor passage to a very steep and slippery mud slope. With much difficulty, canoes were lowered to the edge of more deep water. The real problem was getting into the canoes with sloppy mud up the legs and from a slippery bank with no footholds. Exploration of the rest of the cave was undertaken in shifts as not all of the canoes were carried through to the inner lake. There were some tense moments, but once aboard the craft our group was able to paddle around a large chamber with huge formations dangling from the roof and others protruding from the water. It was all very amazing. However, erosion of the formations was quite evident, due to long periods of immersion in the dam water. At the end of this inner lake passage, probably some 35 metres long, there was a very sloppy mud bank with knee-deep chocolate brown ooze. The mud became a little firmer as one climbed up the slope and into several passages. The right being rather roomy with little formation worth noting. The left passage and chamber was the most extensive, and contained a small sump



Bronwyn Turner & Mathew Wilson, canoeing on the inner lake of Main Cave, Cave Flat

with fresh water shrimps up to 50 mm long. At the back of this chamber a low 'Z' shaped crawl-way finally ended in what we would normally class as a classic dig site.

Back near the start of this chamber, there was a high rift passage leading to a small chamber, This required an extremely difficult chimney up gooey mud covered rocks. At the top there was a good display of pristine speleothems, which had obviously escaped the erosion by dam water. One could conclude that either an air pocket is normally trapped in this high chamber or it is just above the high water level mark. If the latter be the case, then the chamber must be very close to the surface, in the centre of the island.

As our group began to withdraw equipment from the inner lake, the dry passage began to fill with people brandishing Dolphin torches and dressed in good cloths. Several fishing boats had entered the main chamber. Exhaust fumes filled the cave and we were glad that our group was on the way out. These day trippers 'Touri' asked questions like, "What are these white things hanging from the roof and how did they get here?" Some time was spent explaining the mechanisms which form caves and speleothems, but I am sure only a part of the reason was comprehended. Thankfully the remaining good formations are beyond the physical reach of the average Joe Bloggs and should be safe for some time yet. This inaccessibility, being due to the very difficult and slippery climbs and inner lake when the dam water is low, and the need for scuba gear in high water.

Anyway, the rest of the time was spent exploring caves on the now dry part of the island. While many of the caves entrances are tagged, there are still a number which are not. Dive lines extend into a number of the larger caves including, CF11 and CF15. Most caves contained sloppy chocolate brown mud which was on the nose (putrid) in their lower reaches. Despite this the ground trogging and cave exploration was fun.

The other extremely interesting thing about the karst area is that the exposed Devonian limestone has been completely washed clean by the wave action as the dam water level receded. This has exposed many excellent examples of fossils through out the limestone outcrop. Fossils include:- molluscs (gastropods and caphalopods), brachiopods and trilobites. There are also fossils of lung-fish and armoured fishes.

I am led to believe that the last big drought of 1982/3 saw the dam level down to 3% capacity. Since that time the authorities decided that in times of droughts, the dam water would not be released if the level dropped to 8%. Consequently this was the attraction for our group of 'dry cavers' to go caving in an area usually under water. The divers in our club think this is old hat and are waiting for the water level to rise before returning. I'm not a diver, but I reckon dry caving on this occasion saved a lot of time without need for decompression!!!!!!

Participants from NEWCAVES were:- Ken Turner, Elaine Turner, Kathlene Turner, Bronwyn Turner, Christopher Turner, Matthew Wilson, Gary Whitby, Jenny Whitby and Garry K. Smith.

I leave you with a bit of history.

The Burrinjuck Dam construction was commenced in 1907 and completed in 1928. Strengthening and enlargement was completed in 1953. The small limestone hill previously known as Cave Flat contains a number of caves, among them a rather large one which had its entrance at the base of a large cliff. The Parliamentary report "Exploration of the Caves and Rivers of NSW", 1882 published a letter from Mr C. Jenkins to the Trustees of the Australian Museum. The letter dated 2nd Sep 1881 describes the excavation of a cave at Cave Flat in search of fossils and bones. The cave being located near the junction of the Goodradigbee and Murrumbidgee Rivers, and situated 4 chains 86 links West of the East corner of Swift's 65 acres, country of Harden. This cave was described by Jenkins as cave No. 1. "The cave has a noble entrance in the face of a near vertical cliff of limestone, about 78ft high. The entrance is about 40 ft above the Murrumbidgee ordinary summer level, and above the height reached by the great known flood (1870). As seen on the face of the cliff the entrance has a triangular form..... A triangular form is preserved, more or less through all the passages and chambers. The entrance chamber at the entrance is 42 ft wide, and has a depth of 80 ft, with a height of about 30 ft. From this chamber two passages start, one from each of the far corners. That from the right is a length of 200ft; that from the left a length of 420ft". The excavation is then described in detail. "In all I have 1,600 bones, representing the parts of the skeletons of at least 200 individuals." (Marsupials). In a letter dated the 16th September, Jenkins states that "I have excavated the whole, as far as practicable, of the entrance chamber. I have also excavated in the right-hand passage."

Three other caves are described.
Cave No.2, The principle chamber, approached by a low passage is 38ft by 25ft. From the right corner of this passage leads to near the surface, 36ft long. From the left there is a passage 30ft long. From the right passage another leads to the left 45ft long.
Cave No.3. The principal chamber is 132ft by 20ft, approached by a passage 45ft long. From the right-hand corner of this passage leads 70ft by 30ft. From the left-hand a passage leads 15ft by 15ft.
Cave No. 4. The principal chamber, approached by a passage 20ft long, is 140ft long by 30ft; from this passage leads 40ft long by 15ft wide.

Certainly the No.1 Cave which Jenkins talked about was the one which our group of NEWCAVES members were able to paddle into.

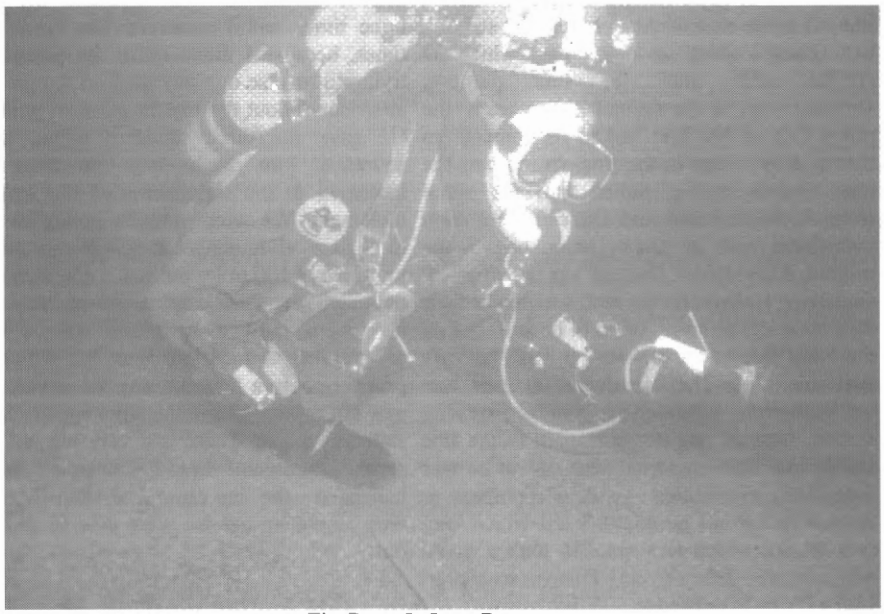
Fossilised Tubular Coral in Devonian Limestone at Cave Flat

PLUMBING THE DEPTHS OF INKY BLACKNESS

By Stefan Eberhard
[All Photos by Stefan Eberhard]

"In Xanadu did Kubla Khan
A stately pleasure-dome decree:
Where Alph, the Sacred river ran
Through caverns measureless to man
Down to a sunless sea"

- Samuel Taylor Coleridge



Tim Payne In Junee Resurgence

In March 1959, Bill Kunert, Glyn Davies and Michael Tobias penetrated 200 feet into an underground spring at Mole Creek. The divers were attempting to explore the resurgence of the River Alph, which disappears into a siphon inside the fabulously decorated Kubla Khan Cave before emerging about a mile away on the other side of the hill. It was the first cave dive made in Tasmania (Frauca 1959).

Kunert carried a sealed beam light of 12 volts powered from a lead wire connected to a battery on the surface. The lead ran along a 200 foot lifeline tied around the waist of Kunert and fed from the surface. Tobias and Davies were clipped into the line with karabiners. With Kunert leading the three divers submerged and disapeared. They had to dive headfirst through a bottleneck that was so narrow their aqualungs scraped the rocks.

At the end of the 200 foot line the divers surfaced in an airbell. Clinging to the crumbly mud walls, their breath steaming around their masked faces, the frogmen stared in wonder at the eerie sights in an underground stream. Their teeth were chattering, their limbs were almost numb and they found breathing difficult underwater in the intense cold. There was only one thing to do - retreat. Had they gone on they might never have come back, as the cold waters would have claimed their lives (Frauca 1960).

In February 1965, Brian Barlow, Lance Barlow and Carl Summer borrowed 1,000 feet of baling twine from nearby residents and managed to penetrate 750 feet into the resurgence - an Australian *record (The Mercury* 27-2-1965). On their next attempt the team claimed to have penetrated a distance of 1,685 feet.

In 1974 Bill Kinnear and two companions made a series of dives using a base fed line with a communication cable which enabled the surface crew to talk with the divers when they surfaced in air pockets. Two of the divers surfaced in an air pocket 80 metres into the resurgence and using their 'black box' device they informed the surface crew that the third diver had failed to show up. They were informed that 120 metres of line had been fed out to the missing member who had apparently become entangled underwater. He eventually surfaced in the air pocket festooned in rope. The team continued on, but not without further incident;

'The torches did nothing but reflect a blinding glow and all I could see were my own bubbles.... I had the rope in my hands but didn't know which way along the rope was out and which was towards Bill. .... I pulled in yards of the stuff, first from one direction and then the other, and finally felt Bill pulling at the rope and swam to him and surfaced. Both air tanks were approaching the half full mark and return to the surface became urgent' (Robertson 1977).

On a subsequent dive Bill Kinear pushed ahead alone. His single air tank was drawn to half full when he turned around at a point 1,200 feet into the resurgence. Plans to return were abandoned when Kinnear died in a hunting accident a few days later.

It wasn't until February 1978 that the connection into Kubla Khan Cave was completed by Ron Allum, Phil Prust and Peter Stace (Stace 1979). The connection was surveyed by Nick Hume and myself in 1983, revealing 1.1 km of passage containing three siphons of 500m, 120m and 40m length. The length of the siphons varies considerably depending on water levels.

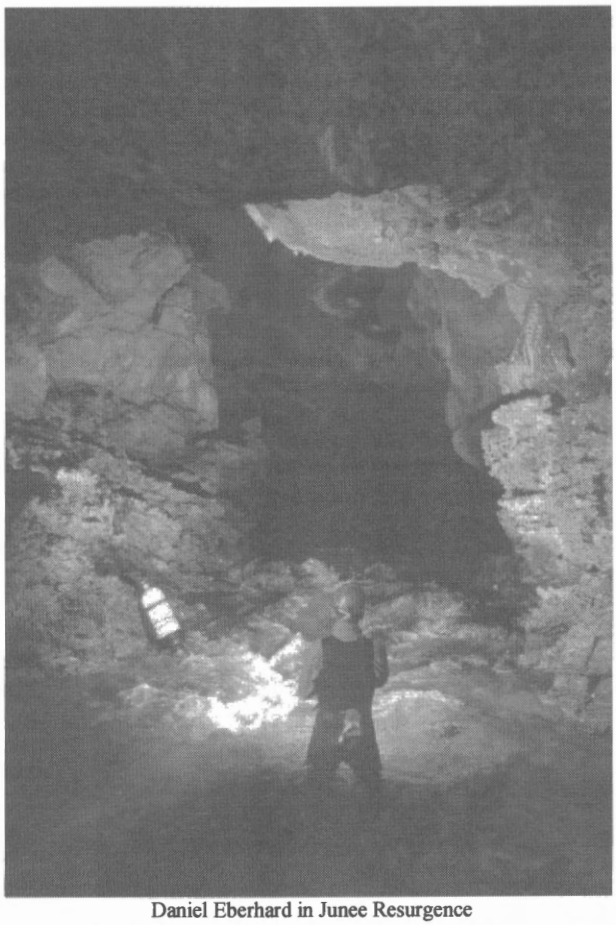
The first exchange through trip soon followed. Nick Hume and Stuart Nicholas dived from the resurgence end whilst Rolan Eberhard and

David Doolete & Tim Payne preparing to dive the second siphon in Junee Resurgence

Duncan Holland abseiled into Kubla Khan at the other end of the system. The teams met up in Cairn Hall, where the diving and caving gear was swapped, then each team continued out in the opposite direction. So far everything had gone according to plan. However, there was a lack of solid natural anchors to tie the line off at the start of the third siphon, so Nick had brought along an onion bag, which he stuffed with mud for this purpose. Unbeknownst to the second diving team, the onion bag anchor had leaked its contents so that as they reeled in the line, so too was the now useless anchor pulled into the sump towards them. Rolan and Duncan were soon confronted with an empty onion bag in the middle of the siphon. Duncan was unperturbed, so leaving Rolan with the reel, which was their only security, he swam on until he surfaced on the other side of the siphon - it was Duncan's first cave dive! They continued on their way out but became separated again in the first long siphon. Duncan had got entangled in the line and by the time he sorted himself out he was completely disoriented - with no compass or detectable current he couldn't tell which way was in and which was out. He took a guess which proved to be correct - Duncan seemed to lead a charmed existence.

Recalling those early days now I think we had all been very lucky. I remember getting scared on numerous occasions, as we learnt the rules of survival in cave diving by trial and error. One hard-learned lesson in particular is worth relating. Union Cave at Mole Creek had received brief diving forays by Toby Clark in 1971. In 1979, Frank Salt and Peter Cover passed three short siphons but were unable to scale the sheer wall leading out of the water on the far side. Rolan and I ventured in there soon after we started cave diving. We passed through the first duckunder and peered into the second siphon - the water was beautifully clear and there was no silt on the bottom, so throwing caution to the wind we dived through without laying a line, which we intended to save for use later on. The third siphon was not so straightforward as the sediment we stirred up obliterated all visibility. Before losing the visibility entirely we were able to find our way some 40 metres through to the far side. We eagerly clambered out of the water and explored about 250 metres of nicely decorated cave before encountering another siphon.

We felt pleased with our discovery, but a little apprehensive about the return dive in zero visibility, so we organised some signals to communicate with by a series of 'hand-squeezes'. One squeeze meant 'Stop', two squeezes meant 'OK', and three squeezes meant 'There is a slight problem'. We set off, reeling in the line as we went, until the line unexpectedly disappeared into a narrow slot - until now we hadn't learnt the technique of rebelaying the line to prevent it being pulled sideways into hazardous restrictions, or so-called 'line traps'. Rolan attempted to follow the line into the slot but it soon became impossibly narrow. He squeezed my hand three times and I squeezed him back three times, because I didn't relish the prospect of trying to reverse our way back to the previous airspace without the line in place to guide us. He gave me three squeezes again, and I squeezed him back. My breathing rate increased as the seriousness of our situation took hold. We were probably going to die I thought, as vivid images started to roar through my brain at 100 miles per hour, one image was the tragic scene that would confront Nick when he came to retrieve our bodies. After a period of time that seemed like ages, but which was probably only a few minutes, we developed a new underwater communication signal - lots of squeezes meant 'There is a very big and very serious problem here.' Then a miracle happened - the line came free from the slot it was caught in and we were able to follow it out.



Daniel Eberhard in Junee Resurgence

Upon surfacing we both swore never to go cave diving ever again. Our trials were not quite over however as we still had another siphon to get through - the one with no line in it, and which by now was completely silted-out. Suddenly no longer brash, I groped my way through using the line reel, and then reeled-in Rolan from the other side. We both learnt a lot about cave diving that day.

KUBLA KHAN February 1998

Chris Brown disappeared into the gloom as I struggled along behind, the gumboots I was wearing were causing considerable drag thus handicapping my finning movements. I caught up with him as he was clipping on the fourth reel of line, which would hopefully take us to the end of the first siphon. He scampered ahead again but soon came back, bringing with him a cloud of silt which enveloped both of us. Using sign language he indicated that the passage ahead got narrow, and also could I please disentangle the line which had wrapped itself around his tank valves. He then thrust the reel into my hands with the obvious implication that I should take the lead since I had been through the siphon before and therefore ought to know the way. In deteriorating visibility I probed ahead cautiously until getting to an unpleasant restriction which I did not remember from my previous visit 15 years before. I glimpsed an old piece of rotted line buried in the silt, a relic from the pioneering dives done here in the 1950's and 60's. I sensed the feeling of extreme isolation and loneliness, which must have accompanied those early explorers when they first entered this cold, dark and inhospitable place. I felt in control of the situation but I definitely wasn't having fun as I groped around in zero visibility trying unsuccessfully to find the way on - it seemed like the passage had been nearly filled up with sediment. There was only one thing to do - retreat. I couldn't see Chris but I knew I'd found him again when our helmets 'clunked' together. I gave him a gentle shove in the direction of 'out', and with no further encouragement he was gone.

David Doolette and Tim Payne meanwhile had been patiently waiting for us to appear at the Pleasure Dome in Kubla Khan Cave - the plan had been to do another exchange through trip. It was a disappointment not to succeed in completing the through trip, but as my pommie cave diving friend, Scoff, put it, 'No one died so that's a positive result!'

JUNEE CAVE

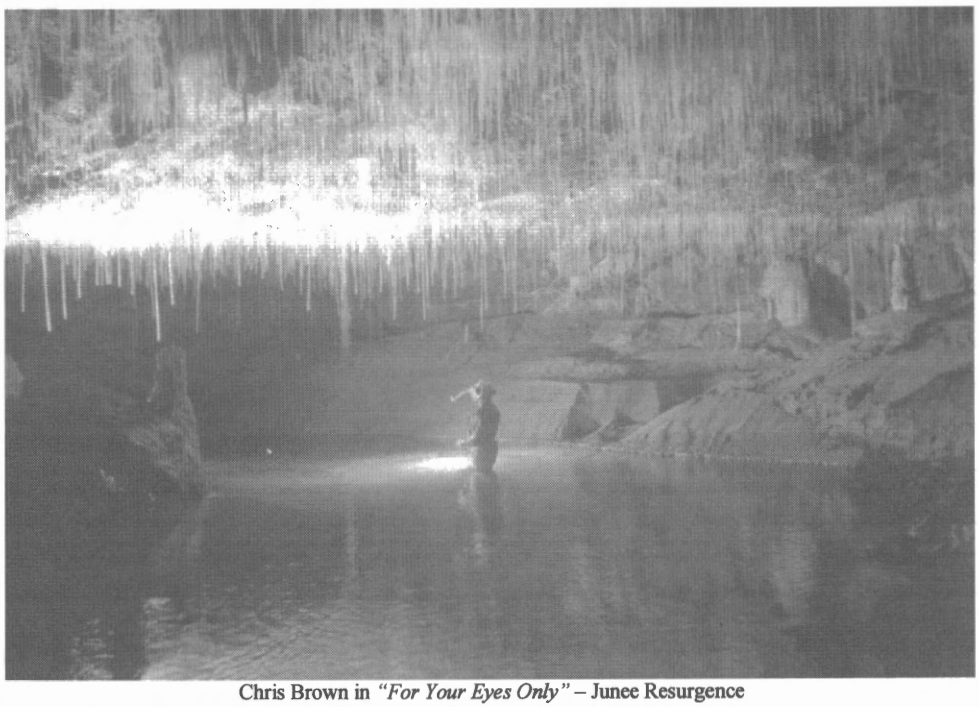
Junee Cave is a big resurgence, collecting water from many deep inflow caves situated up to 14 kilometres away. The site clearly has potential to lead the way into a very extensive cave system, the so-called Junee Master Cave. The Junee River emerges from a siphon about 100 metres inside the cave entrance.

In February 1966 Carl Sommer, Lance and Brian Barlow, and Dick Lane swam 550 feet

into the siphon to a depth of 55 feet (The Mercury 28-2-1966).

In February 1978 Ron Allum, Phil Prust and Peter Stace penetrated 120 metres into the siphon, but reported there was little chance of breaking through due to the hazards of cold, poor visibility, strong flow and the small and treacherous nature of the cave (Stace 1979).

In 1981 the Tasmanian Caverneering Club took up the challenge at Junee. Nick Hume, Rolan Eberhard and myself were the chief protagonists, assisted by Stuart Nicholas, Attila Vrana and others. Over the course of numerous dives, a heavy duty fixed line was gradually installed further and further into the siphon. The effort finally paid off in 1982 when Nick located a small air-bell, and then shortly afterwards Rolan reached the end of the 220 metre long first siphon. A piece of the puzzle to the Junee Master Cave had at last been realised. A magnificently decorated section of river passage - named 'For Your Eyes Only' - was tantalisingly short before we encountered a second siphon. This siphon proved to be a major obstacle as it started to descend deeply, thus incurring serious decompression problems. Hume reached a depth of 30 metres, and then in 1985 Ron Allum and Peter Rogers got to 35 metres depth but found no apparent way on. Cavers meanwhile kept searching for an alternative route into the master cave via the deep, wet caves located on the mountain slopes above.



Chris Brown in *"For Your Eyes Only"* – Junee Resurgence

In 1992 I went into Junee for another look. Passing the previous limit of exploration I negotiated a minor restriction at a depth of 44 metres where the current was screaming past me like a freight train from hell - so much water had to force its way through somewhere. At this depth I was suffering from nitrogen narcosis, the effects exacerbated by the cold water and poor visibility. The tunnel continued on - enticing, deeper.

My elation at discovering the cave was still going was tempered by an incident on my way back out. One of my regulators began to free-flow - a pebble lodged in the valve causing rapid loss of air. I struggled unsuccessfully to clear the blockage, then attempted to turn off the valve to the tank when suddenly I got severe cramp in both legs. In a short period of time one of my air supplies was completely drained. I exited using the one-third reserve supply of air remaining in the other tank. This sobering episode reinforced a couple of the fundamental rules of cave diving - that is, always use at least two independent air supplies, and, keep at least two thirds air supply in each tank for the return from the point of furthest exploration. On my way back through the first siphon I was dealt one final humbling experience - the zip on my drysuit failed and the suit flooded with water. The cave seemed to be smirking at my futile, hollow victory - if Junee were to be personified its most enduring characteristic would be *Schadenfreude*.

The exploration had reached the limits of depth and decompression using air, so far as I was concerned anyway. To push further required the use of mixed-gas techniques to combat the narcosis, as well as pure oxygen to cut down the decompression times. Such technical diving demands considerable expertise and a serious approach, and it isn't cheap either. It wasn't until February 1998 that a team of divers with the appropriate credentials were lured into Junee - Cocklebiddy record holder Chris Brown, diving medicine expert Dr David Doolette, and rising 'top gun' Tim Payne.

David and Tim did the first push dive. They breathed a special gas mixture containing 40% helium, 12% oxygen and 48% nitrogen. The inert gas helium was used to reduce the percentage of nitrogen in the breathing mix (normal air is 78% nitrogen), thus reducing the effects of nitrogen narcosis - this would allow them to dive deep without experiencing narcosis symptoms more severe than those encountered at an equivalent air depth of about 40 metres. Helium however, aside from distorting your voice to sounding like that of Donald Duck, rapidly sucks the heat out of you because it has a high thermal conductivity - clearly not desirable in cold water. To combat this the divers inflated their drysuits from a pony tank containing argon gas, which has better thermal properties. The lowered oxygen concentration in the breathing mix (normal air is 21% oxygen) meant it would be hypoxic if breathed at shallow depths, so David and Tim also carried a tank of 'travel gas' containing normal air, which they would use between the surface and 35 metres depth.

The dive profile still required lengthy staged decompression stops, to allow the controlled removal of the nitrogen and helium absorbed by their tissues under pressure. If they ascended too rapidly they risked the formation of bubbles in their tissues causing decompression sickness - the 'bends'. The rate of off-gassing can be significantly enhanced, and hence deco times reduced, by breathing pure oxygen at the deco stops. Pure oxygen however, has its own physiological complications - it becomes toxic under pressure. The likelihood of suffering an oxygen convulsion above 9 metres depth is remote, but to increase their chances of survival in case of such a mishap, David and Tim had full face masks attached to their oxygen tanks. The full-face masks also helped to reduce the chilling effect of the cold water.

Tim and David got to the previous limit of exploration but were soon confronted by a daunting restriction - jagged blades of razor sharp rock hung from the roof like menacing teeth. They pushed through to a depth of 50 metres where the passage seemed to pinch out, but they noticed a possible alternative way on back at 'The Teeth'.

'It's a scary, narky place down there', David and Tim both commented afterwards.

It was Chris's and my turn next. We had a strict time schedule to keep if we weren't to violate our dive and decompression profile. The schedule had been carefully calculated by Tim and David using a clever computer program - both are experts in this field of diving. It boosted my confidence to know that we were doing this dive with a very high margin for safety. Needless to say, 'For Your Eyes Only' is not a good place to get hit by the bends.

I felt unexpectedly calm before my first mixed-gas dive. We dumped our oxygen cylinders at 6 metres and continued on to 35 metres where

we dumped our cylinders of 'travel gas' and switched to the deep mix carried on our backs. - We were on schedule. We got to 'The Teeth' and wended our way through, carefully positioning the line so we wouldn't get stuck whilst returning in zero visibility - we did this by anchoring the line to pieces of poly pipe shoved into the sediment like ice screws. Throughout the second siphon we took great care in positioning the line to prevent it being severed on sharp rocks during next winter's floods, and to prevent it being pulled into line traps.

Following Chris in the clouds of silt that billowed past me I got occasional glimpses of green water and blue rock as he disappeared down virgin tunnel. I was intoxicated by narcosis and adrenalin, but focused my attention on monitoring my gauges - at this depth both time and air supplies go very quickly. All too soon we had reached our turning point - the depth was 60 metres but the tunnel kept barrelling onwards. We groped our way upwards. For just 10 minutes of exploration time we incurred 60 minutes of decompression - by the time we finally surfaced I had stopped shivering.

The final push was done by Tim and David again. It had rained overnight and the Junee River was still rising as we wrestled our way upstream. Both divers were already chilled and a little unhappy with the situation even before they commenced their dive. After they surfaced they were even less impressed - they had got to the previous limit but were unable to swim any further against the strong current. In 1985, Hume and Vrana had also been spat out of Junee when a flood pulse came through. David and Tim conveyed their feelings to me, 'Stef, you can keep your bloody cave.'

Living up to character, it seemed that Junee had the last laugh once again. We'll be going back for more next summer.

References

Frauca, H. (1959) The cave divers. *People* September 2 1959: 17-19.

Frauca, H. (1960) Deep dark dive. *Australian Outdoors* May 1960: 12-14, 78-79.

Roberston, D. (1977) Twelve hundred feet under at Mole Creek. *Speleo Spiel* No. 128.

Stace, P. (1979) Cave diving in Tasmania. *ASF Newsletter* 84: 14-16.

Daniel Eberhard in Junee Resurgence

CAVE FAUNA

By Stefan Eberhard
[All photos by Stefan Eberhard]

There is a surprising variety of life which dwells underground. The underground cavities inhabited by animals include both air and water-filled spaces, and range in size from minute pores and cracks only a few millimetres across, to huge caverns tens of metres in diameter. The range of subterranean habitats includes for example, the deep layers of the soil and the spaces between sand grains in the beds of rivers, as well as the cavities formed underneath boulders on mountain slopes. The subterranean fauna we are most familiar with however, is that which occurs in caves which are large enough for people to enter. Large caves may form in sea cliffs, basalt, granite, dolerite, and other types of rock. The most extensive caves tend to be formed in carbonate rocks such as limestone and dolomite, because these rocks are more soluble in natural waters. The sinkholes, springs, cave systems, and other distinctive erosion features which tend to develop in carbonate rocks are known as *karst*. The special nature of karst environments means that particular care must be taken to prevent degradation occurring.

Large Bent-Wing Bat. *Minopterus schreibersii*.
Sea Cave at Madgee NSW

The cave environment

Cave environments are strongly buffered against the daily, seasonal, and longer term climatic changes occurring on the surface. Cave environments provide stable, sheltered and moist refuges for animals which otherwise might not survive on the surface.

The cave environment can be divided into a number of distinct zones. The *entrance zone* is where the surface and underground environments meet each other. The *twilight zone* is where light progressively diminishes to zero. Beyond the twilight zone is *the transition zone*, where light is absent but the environmental effects from the surface are still felt. Remote from entrances, the deep zone is characterised by complete darkness, a near constant temperature (usually approximating the mean annual surface temperature), a high relative humidity, and a low rate of evaporation.

Food supply for cave ecosystems

Because green plants cannot grow in the complete darkness of caves, the food supply for cave dwelling animals must ultimately come from the surface. The food supply consists of plant material carried in by streams or which falls in under gravity, bat guano, and other animals which wander, fall, or are swept underground. Usually only small quantities of food reach the deep cave zone.

Because cave ecosystems are directly dependent upon the surface environmental conditions, changes occurring above the ground may also affect the underground environment and fauna. Thus it is important to maintain the natural conditions of soil, vegetation, and water quality on the surface above caves, and in the water catchment draining into caves.

Cave fauna habitats

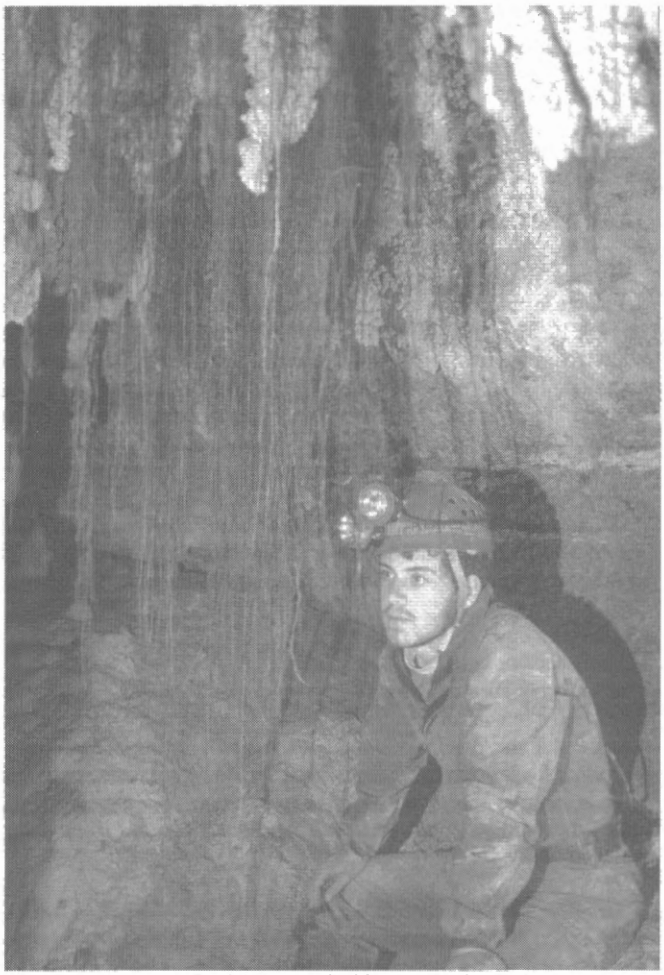
There are a number of distinct habitats in caves where particular species occur, although some species range widely across several habitat types. Aquatic habitats include streams and pools. Examples of terrestrial habitats include sediment banks, particularly those alongside streamways, tree roots, fungi, and organic material such as leaves and wood, animal droppings (especially bat guano) and carcasses.

Troglobites

Some species have become highly specialised to underground life. These species are known as *troglobites* (troglodytes are people inhabiting caves). Troglobites display a number of characteristic modifications which suit them to underground life. These modifications include the gradual reduction or complete loss of eyes and body pigment. To compensate for the absence of vision, troglobites have evolved longer legs and antennae than their surface dwelling counterparts, as well as other sensory structures such as hairs and an enhanced sense of smell. Generally confined to the deep zone of caves, troglobites have a lowered metabolic rate and are able to withstand long periods of starvation.

Troglobites are entirely dependent upon caves for their survival. They have evolved over long periods of isolation from their surface dwelling ancestors which have either long since become extinct, or migrated elsewhere because of changing conditions on the surface.

Many troglobites have a very restricted distribution, often being

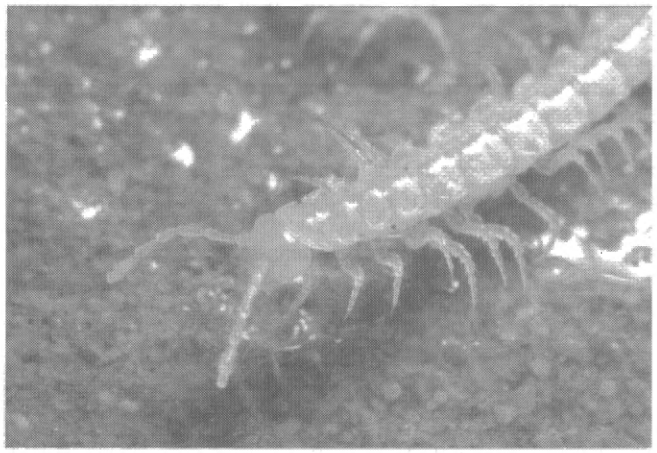


Daniel Eberhard with tree roots in
Bradley Chestermans Cave, Ida Bay

confined to a single cave system or karst area. The relative constancy of the cave environment means that they have a reduced capacity to withstand environmental fluctuations. These characteristics make them vulnerable to extinction from a range of threats.

Troglophiles, trogloxenes, accidentals, and guanophiles

There are four other categories of cave dwelling animals, depending upon their degree of ecological/evolutionary association with the cave environment. Some cave dwelling animals spend their entire life cycle underground, but they can also survive successfully in above ground habitats - these species are termed *troglophiles*. Other cave dwelling animals spend only a part of their life cycle within caves - these species are termed *trogloxenes*. Another category are *accidentals* - these are species that are not normally found in caves but which may accidentally wander, fall, or be washed underground. Accidentals are an important food source for the permanent cave inhabitants. Bat guano supports a distinctive community of invertebrates which feed directly on the guano, or the micro-flora which grows on it - these species are termed *guanophiles*.



Troglobitic Millipede, Exit Cave, Ida Bay

Tasmanian Cave Fauna

The cave fauna of Tasmania is amongst the most diverse and abundant in the temperate climate region of Australia (Eberhard *et al.* 1991). The fauna is composed almost entirely of invertebrates, although platypus, wombats, devils, possums and rodents occasionally utilise caves. Bats rarely dwell in Tasmanian caves. The prominent groups of invertebrates present are spiders, crickets, beetles, harvestmen, millipedes, glowworms, molluscs, and crustaceans. Other invertebrate groups present include segmented worms, flatworms, pseudoscorpions, mites, symphylids, springtails, and various types of insects. The invertebrate cave fauna is incompletely known and new species are still being discovered. Some of the more commonly encountered species are described.

Tasmanian cave spider (Fig 2)
Hickmania troglodytes

This endemic species is the largest spider in Tasmania. A troglophile, this species is common in the entrance, twilight and transition zone of caves, but it also dwells in suitably dark, sheltered surface habitats such as hollow logs, or underneath buildings and bridges. The spider spins a large horizontal sheet web which may be more than a metre across. In caves the spider's main prey are cave crickets. *H. troglodytes* is believed to live for many years.

H. troglodytes belongs to an ancient group of spiders which are believed to be ancestral to the modern spiders. This group is characterised by the possession of two pairs of book lungs which are visible as brown patches on the underside of the abdomen. Modern spiders have lost one pair of the book lungs. The ancestry of *H. troglodytes* dates back to before the break-up of the supercontinent Pangea. The species nearest relatives live in Chile, with other more distant relatives in China and the USA (Forster *et al.* 1987).

The reproductive history of *H. troglodytes* has been studied by Niall Doran at the University of Tasmania (Doran *et al.* in prep.). Mating involves a prolonged courtship routine which begins with the male signalling his approach to the female by gently plucking the silk strands of her web. The male then carefully approaches the female whilst gently and repeatedly tapping the female with his front legs, a definite signal which seems to deter the female from attacking. Eventually the male and female may join together. The male possesses a special notch on his second pair of legs which he uses to restrain the female while he transfers his sperm. During mating, venom may be seen dripping from the fangs of the female, and some males end up becoming a post nuptial snack!

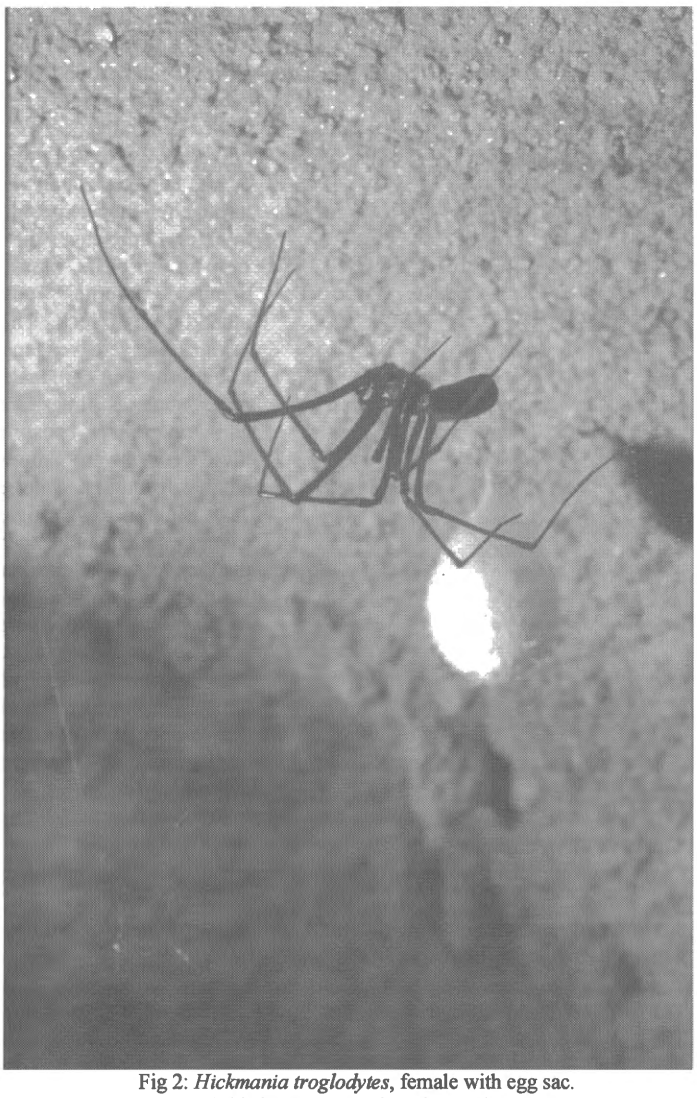


Fig 2: *Hickmania troglodytes*, female with egg sac.
[This issues cover photo is a male]

The female constructs a pear-shaped egg sac, which is suspended from a single thread. The egg sac is closely guarded by the female for up to 9 months, a period which is considerably longer than the one to two months typical of most other species of spider (Doran *et al.* in prep.). The silk of the egg sac has properties which make it very resistant to fungal attack. After emergence, the many hundreds of young spiderlings stay close to the parental web for a few weeks before dispersing to other parts of the cave - few survive to adulthood.

H. troglodytes is not aggressive or dangerous toward humans. Their webs constructed near cave entrances are easily broken by people entering caves.

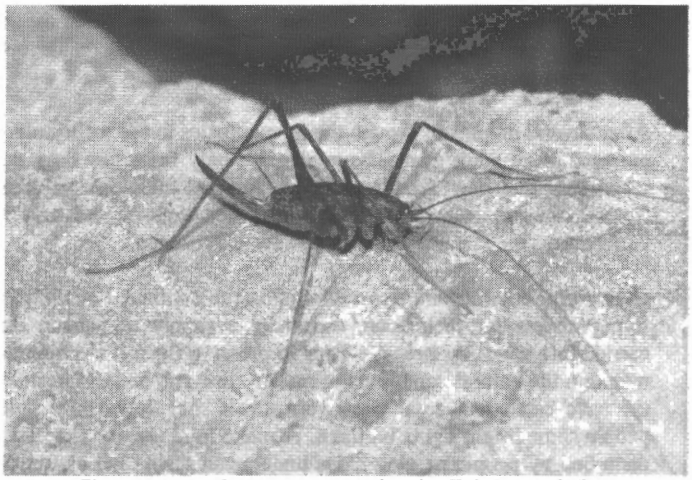


Fig 1: *Micropathus tasmaniensis*, female, Exit Cave, Ida Bay

Cave crickets *Micropathus* species
(Figure 2)

Cave crickets dwell mostly in the transition zone, where they form dense colonies on the walls and ceiling. These insects are prone to drying-out so they tend to congregate in nooks and crannies away from air currents. Cave crickets possess very long antennae which help them to navigate, and detect prey and enemies in the darkness. In Tasmania, there are a number of species of cave crickets belonging to the genus *Micropathus* (Richards 1972). These species are not confined to caves but also occur in suitably dark and moist surface habitats. They are classified as trogloxenes because on certain nights, when weather conditions are favourable, they emerge from the cave to seek food. Cave crickets are omnivorous scavengers, browsing on mosses but also scavenging other invertebrates. They are also cannibalistic.

Female cave crickets are readily identifiable by the long egg-laying structure (ovipositor) which projects from the rear of the abdomen. The female uses the ovipositor to push a hole into a suitably soft and moist mudbank, into which she deposits a single egg. Juvenile cave crickets, like other arthropods, must go through a series of moults before reaching adulthood. Each moult involves the laborious task of shedding the old exoskeleton, then growing as rapidly as possible in the short time before the new exoskeleton hardens.

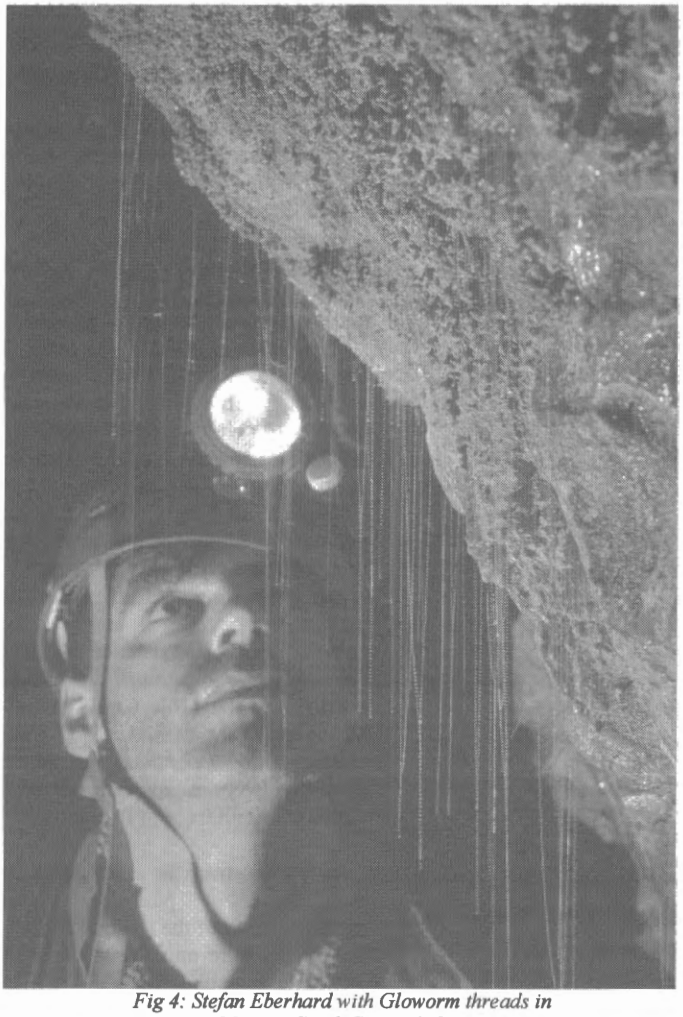


Fig 4: Stefan Eberhard with Gloworm threads in Mystery Creek Cave, Ida bay

Fig 3: *Arachnocampa tasmaniensis*, with -prey

Cave crickets are easily disturbed and may panic when people pass close by, or shine lights on them, so care must be taken not to unduly disturb them. The soft moist mudbanks where they deposit their eggs are vulnerable to trampling and compaction - these sites can be recognised by the small elliptical pock-marks made by the ovipositor.

Glowworms *Arachnocampa tasmaniensis*

Glowworms **(Fig 3 & 4)** are one of the most spectacular of underground sights. In a few caves they are found clustered on the walls and ceilings in their thousands - their myriad twinkling blue lights resembling stars in the night sky. Glowworms are troglophiles because they also occur in moist and sheltered surface habitats such as gullies in rainforest.

Glowworms are not really worms, but the luminous larval stage of a fungus gnat. The cold blue light of the glowworm is produced by a chemical reaction in a special organ in the abdomen. The insects are able to switch-on and douse their lights at will.

The life history of the New Zealand glowworm, which is closely related to Australian species, has been studied by Pugsley (1984). The larva builds a hollow, tubular nest of silk and mucous from which it

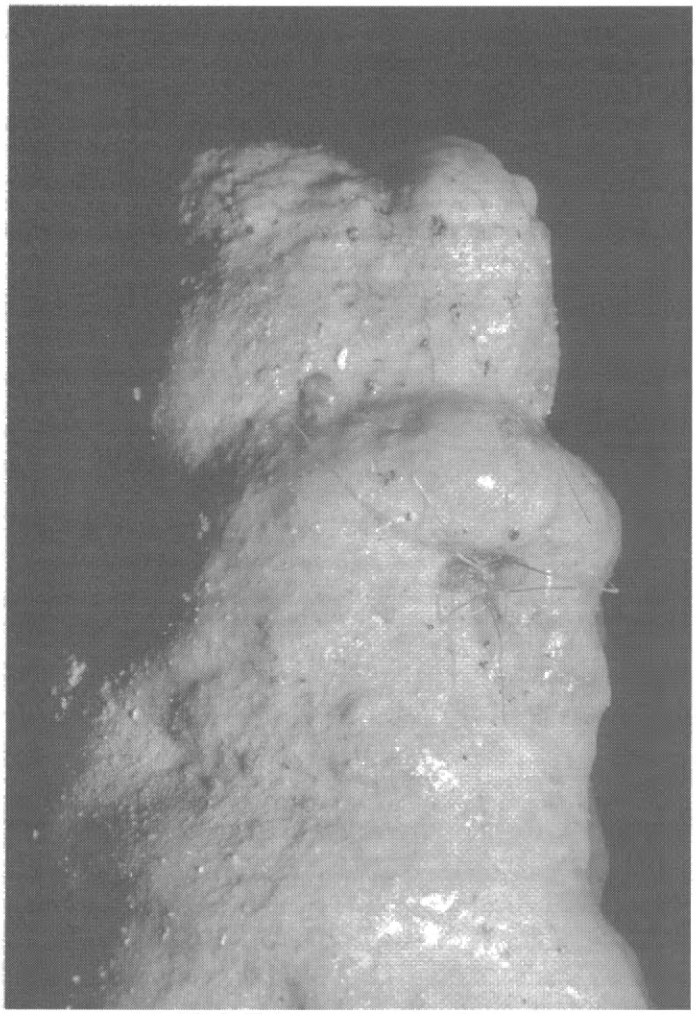


Fig 5: *Hickmanoxyomma cavaticium*

suspends long sticky threads up to 30 cm long. Their food supply consists of flying insects which are attracted to the glowworms light. In stream caves the glowworms main food supply are insects such as stoneflies, caddisflies and mayflies, whose aquatic immature stages are carried underground by the stream. The immature stages then emerge from the water and change into adult flies, whereupon they fly upwards attracted by the light of the glowworm and may become entangled in the sticky threads. When prey is snared the glowworm quickly hauls up the appropriate thread and consumes its victim.

After several months of growth the larva pupates inside a chrysalis then emerges as an adult gnat. The adults live only for a few days during which time they don't feed because they have no functional mouthparts. Instead, they mate and the female lays her eggs on the cave wall. Glowworms may be preyed upon by cave harvestmen.

Glowworm colonies are dependent upon the continued availability of flying insects for their food, especially a supply of aquatic insects carried into caves by streams. Thus to preserve them it is important to maintain the natural conditions of stream flow and native forest within the cave catchment area. Glowworms will shut down their lights if people shine bright lights on them, or make loud noises. They are also disturbed by people passing close underneath them, and care must be taken not to brush against and entangle the long threads.

Cave harvestmen *Hickmanoxyomma* species [Fig 5]

Harvestmen are not spiders. Although they closely resemble spiders they do not possess poisonous fangs or silk organs. Instead they possess a pair of large grasping palps which they use to grapple with their prey.

The long and spindly legged, straw-coloured harvestmen (juveniles are pale) of the genus *Hickmanoxyomma* include a number of troglobitic species (Hunt 1990). Like most troglobitic species, each species of *Hickmanoxyomma* is more or less confined to a single small area of karst. *H. gibbergunyar* for example, is confined to the Mole Creek caves whilst *H. cavaticum* occurs at Ida Bay and Hastings.

Harvestmen dwell on the cave floor and walls throughout the transition and deep zone of caves. Care must be taken not to trample them underfoot.

Cave beetles [Fig 6]

There are a number of species of cave adapted beetles belonging to the family Carabidae. The troglobitic species are recognised by their reddish-brown coloration indicating loss of pigment. Each troglobitic species is confined to a single karst area, for example *Idacarbus troglodytes* occurs only at Ida Bay whilst *Idacarabus cordicollis* is endemic to Hastings Caves despite these two areas being only a few kilometres apart (Moore 1972). No surface dwelling forms of *Idacarabus* are known today, and it is likely that a once widespread ancestor of both these species originally colonised caves from the ground litter of cool, moist forest habitats. It is likely that climatic changes associated with several periods of glaciation and retreat of the forest cover during the Quaternary Era caused extinction of the ancestral surface populations - this would have allowed each of the cave populations to evolve separately in isolation from each other.

Fig 6: Ida bay cave beetle, *Idacarabus troglodytes*

Other cave beetles include *Tasmanotrechus cockerilli* which is restricted to the Mole Creek caves, and the very rare Blind Cave Beetle *Goedetrechus mendumae* at Ida Bay. This highly cave adapted species has virtually lost all trace of it's eyes.

Cave beetles may be seen on the walls and floors of passages, including streamways, from the twilight zone to the deep zone. Care must be taken to avoid trampling them underfoot.

Mountain shrimp *Anaspides tasmaniae* [Fig 7]
The Mountain shrimp *Anaspides tasmaniae* is commonly encountered in streams and pools in caves. A troglophile, this species is also common in surface waters above 300 metres elevation. The cave populations show some loss of pigment as a result of living in complete darkness.

A. tasmaniae belongs to an ancient group of crustaceans known as the Syncarida. Living syncarids appear very similar to fossils found in Triassic rocks, and they are believed by scientists to be related to the ancestors of many other modern crustaceans, such as yabbies and crayfish (Williams 1980).

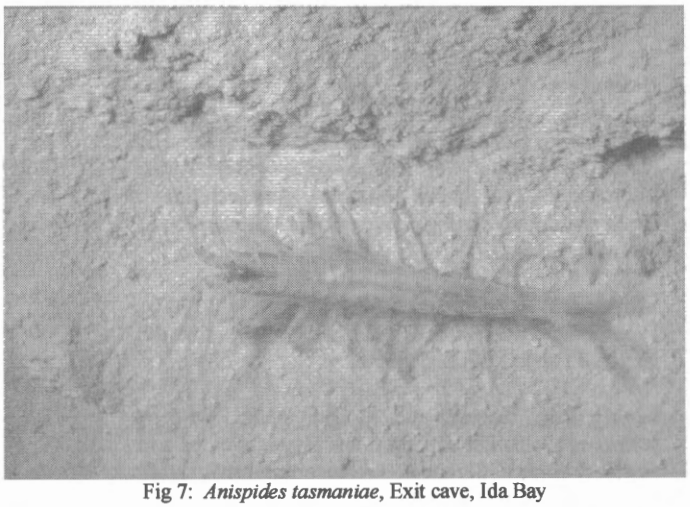


Fig 7: *Anispides tasmaniae*, Exit cave, Ida Bay

Significance
Cave fauna constitutes a distinctive and significant part of Australia's natural heritage and biodiversity. Cave invertebrates play an essential role in underground ecosystems by decomposing organic matter and recycling nutrients through the food web. Many cave species are very rare, and include ancient and primitive forms which are no longer found on the surface. Cave species are important for studies in evolution and ecology.

Threats
There are a number of threatening processes which may affect the survival of cave fauna. These include limestone quarrying, dam construction, land clearance, forestry, agricultural activities, and water pollution. Any of these processes may cause the degradation or loss of habitat and populations by altering cave environments and underground food supplies. Another threat to cave fauna is human visitors to caves who may cause disturbance to, or accidentally trample underfoot, sensitive species and their habitats.

Conservation
To help conserve cave fauna and cave ecosystems it is important to maintain the natural processes which operate above ground in karst areas. This involves maintaining the native vegetation overlying cave systems, especially the vegetation around cave entrances and alongside streams which drain into caves. It also involves protecting water quality in karst areas. Thus it is important to manage the entire water catchment area to maintain the natural processes linked to cave ecosystems. Visitors to caves must take care to avoid disturbing cave fauna, and avoid trampling sensitive habitats underfoot.

Troglobtic cave pseudoscorpion, *Pseudotyrannochthonious*

All fauna occurring in caves in State Reserves is protected. In Tasmania, a number of cave dwelling species are wholly protected under the *National Parks & Wildlife Act 1970.* These species include glowworms, cave crickets, harvestmen, pseudoscorpions, and beetles. It is an offence to take, harm, or kill any of these species without a permit.

Some species are also listed as rare or vulnerable under *the Threatened Species Protection Act 1995.* These species include for example, the Mole Creek cave beetle, Mole Creek harvestman, and Mole Creek pseudoscorpion, as well as the blind cave beetle at Ida Bay.

Minimum Impact Caving
Visitors to caves can minimise disturbance to cave fauna and their habitats by adhering to the Minimal Impact Caving Code of the Australian Speleological Federation (1995). The points listed below are especially relevant to cave fauna:

- Keeping to a single path throughout the cave, especially any routes defined by stringlines or other markers. Do not wander about the place.
- Move slowly and deliberately at all times - take care where you place your hands and feet, whilst looking out for small animals.
- Avoid sensitive habitats such as small pools and watercourses, tree roots, sediment banks, and deposits of organic material (bat guano, leaf litter, wood, dead animals).
- Avoid disturbing bat colonies, spider's webs and glowworm's snares.
- Avoid making loud noises and shining lights directly on animals.
- Do not leave any foreign material in the cave. If you must eat underground, shed your crumbs into a bag for removal. Spent carbide is poisonous to cave life.

Remember, Cave **S.A.F.E.**

S. - cave SLOWLY, cave SOFTLY at all times.
A. - be AWARE of sensitive features, including fauna and their habitats, sediments, bones, cave formations.
F. - be FIT for your recreation. Fitness enables you to move through the cave easily and efficiently, so you can better appreciate the environment and the caving experience. Tiredness and lack of fitness contribute to cave degradation.

E. - cave with EXPERIENCE by joining a caving club - you can learn a lot this way.

References

Doran, N.E., Richardson, A.M.M., & Swain, R. The reproductive history of *Hickmania troglodytes*, the Tasmanian Cave Spider (Araneae, Austrochilidae). [In preparation, Zoology Department, University of Tasmania].

Eberhard, S., Richardson, A. & Swain, R. (1991) The invertebrate cave fauna of Tasmania. Report to the National Estate Office, Canberra.

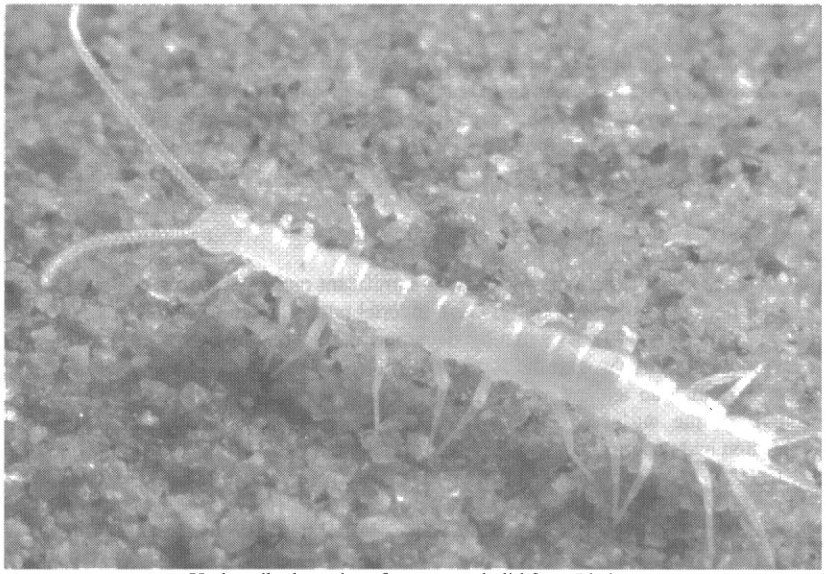
Forster, R.R., Platnick, N.I. & Gray, M.R. (1987) A review of the spider superfamilies Hypochiloidea and Austrochiloidea (Araneae, Araneomorphae). Bull. Amer. Mus. Nat. Hist. 185: 1-116.

Hunt, G.S. (1990) *Hickmanoxyomma*, a new genus of cavernicolous harvestmen from Tasmania (Opiliones: Triaenonychidae*). Rec. Aust. Mus.* 42: 45-68.

Moore, B. (1972) Southern cave beetle fauna in perspective. *Proceedings 8th Biennial Conference Australian Speleological Federation.* ASF, NSW. pp. 81-84.

Pugsley, C. (1984) Ecology of the New Zealand glowworm, *Arachnocampa luminosa* (Diptera: Keroplatidae), in the Glowworm Cave, Waitomo. Journal Royal Society New Zealand 14 (4): 387-407.

Richards, A.M. (1971) The Rhaphidophoridae (Orthoptera) of Australia. Part 9. The distribution and possible origins of Tasmanian Rhaphidophoridae, with descriptions of two new species. *Pacific Insects* 13(3-4): 575-587.



Undescribed species of cave symphalid from Ida bay

Williams, W.D. (1980) *Australian freshwater life: the invertebrates of Australian inland waters.* Macmillan Co Australia.

"DOWN UNDER ALL OVER" *(Parts 1 & 2)*

Speleological Research Group of Western Australia

By Norman Poulter

Part 1

Since our last contribution, SRGWA has taken delivery of two dedicated data loggers as part of a grant from the Gordon Reid Foundation for Conservation. The TSI loggers record temperature, humidity and CO2 [up to 0.5%]. The first use of the loggers was in Ngilgi [tourist] and Crystal Caves on the Leeuwin-Naturaliste Ridge. The dig in the eastern side of the Giants Cave doline continues, as does restoration/photographic work in Calgardup Cave.

During the Christmas/New Year period [1997-98], another expedition to the Nullarbor did not go according to plan. The primary purpose was to gate two "research caves" opened up earlier in 1997. Partial funding had been obtained from the Australian Geographic Society, publishers of the Australian Geographic magazine.

The purpose of the gates is threefold:

1. return the cave's environment to their pre-discovery status,
2. protect the cave's fauna from surface predators,
3. 3. protect the cave's fauna from habitat disturbance by restricting access to authorised researchers and assistants.

During the expedition, only one cave - 6N327 on Mundrabilla Station, had its gate fitted. While the gate was under construction, the data loggers were set up in two locations in the cave and gave very interesting results, which vindicated the reasons for fitting the gate. The other cave, on Madura Station's Roe Plain will have its gate fitted during a special trip over the 1998 Easter period.

There were two reasons that prevented the second gate being constructed. One was that the amount of cement required for the foundations being underestimated. The other was the 24 hour disappearance of one of our members within a couple of hours of arriving on Mundrabilla Station. The resulting search and aftermath, which involved the Police, local community and SES [up to 50 people by Police estimations] "burnt" everyone out and disrupted the schedule too much.

One "highlight" of the Expedition was during an excursion to Thampanna Cave on a 43.C day, measuring the wind speed coming out of the entrance at 123.96kph. A world record?

A one-sided war has erupted on the Leeuwin-Naturaliste Ridge between land managers Augusta-Margaret River Tourist Bureau [A-MRTB] and the Dept. of Conservation and Land Management [CALM]. The A-MRTB objected to the perceived competition it would receive from CALM's development of Calgardup and Giants Caves into commercial "adventure caves". A lot of this development was being done with voluntary labour and as a result of the Gracetown [cliff collapse] tragedy of 1996.

Unfortunately, the belligerence of the A-MRTB may be successful, inasmuch as the caves may soon be put out to private tender. CALM and its supporters [caving community included] are resisting the move. A dangerous precedent could be set for all [potentially] "commercially valuable" areas of CALM territory throughout the state.

Part 2

Following on from SRG's December/January Nullarbor Expedition where a sealed gate over the entrance to the [Mundrabilla] Research Cave 6N327 was fitted, a special Easter trip was staged to fit the gate to the other Research Cave on Madura Station. A party of five from SRG and CEGSA constructed the gate across the entrance of 6N1327 over a period of 3 days.

A party of three entered the Easter Extn. of Mullamullang Cave to carry out some

restoration in the Salt Cellars to protect the "famous" hooked halite decoration seen in numerous speleo-publications. A string-line barricade was installed, blocking off a wide crawl-path that had been created close to the delicate decoration. This barricade in no way impedes progress past the feature - merely diverts traffic to an older adjacent, but more circuitous and less damaging route nearby that lengthens the crawlway by about two metres. This action was suggested by Bart Jansen [CEGSA] during 1997.

Prompted by rain, the party retired to a dryer Mundrabilla Station to inspect any changes that may have taken place in the Research Cave 6N327 in the 3.5 months since its environmental gate had been fitted. The party found most passages "blocked" by active Tartarus webs. A bypass was found past one "obstruction" giving access to the lower level sediment beds. SRG member Michael Bradley noticed a different type of spider on the floor of the cave and called Norman Poulter's attention to it. Norman identified the spider as *Troglodiplura lowryi*, described from body parts collected from Roaches Rest Cave by Jackie and David Lowryi in 1966. A living colony is known to exist in South Australia NE of Nullarbor Station but this discovery in 6N327 is probably the first sighting of a living specimen in Western Australia although body parts have been recovered from several caves over the years, mainly from the adjoining Madura Station. Both the Tartarus and Troglodiplura spiders were placed on the Western Australian Government's "Wildlife Conservation (Protected Invertebrate Fauna) Notice" in 1994.

Rain accompanied the party's withdrawal from Mundrabilla Station to a temporarily dryer Nullarbor National Park in South Australia. They met up with District Manager Brett Dalzell who accompanied them for the next few days. They spent two nights lodged in the partially restored Koonalda Homestead. A fauna survey was conducted in 5N15, 21, 223 and 882. A surprising find was a harvestman spider from 5N15! Caves 5N882 and 15 were also mapped. One vehicle suffered an oil pump failure which necessitated an 800km tow back to Norseman.

NSW SPELEO COUNCIL "SPELEOSPORTS"

By Lucinda Coates

As some of you know, SUSS hosted the recent (Saturday 18th April) Speleosports obstacle course, and I'm pleased to report that it was excruciatingly excellent and an unmitigated success.

The gymnasium grounds associated with MUCG's sports association has for many years been the venue for this activity undertaken by frustrated cavers. MUCG has also been the host/organiser for the past 2 years (prior to 1998) but, before then, many different NSW clubs organised the course. Never,however, in the history of this prestigious event, has so much been required of so determined a club executive for so little reason.

For those of us (un?)fortunate enough to subscribe to ozcavers, a continuing saga of bureaucratic bollocksing-about unfolded almost daily, as the SUSS Committee went in to battle for the rights of cavers to make absolute fools of themselves and get really wet.

Keir and his crew of engineering geniuses took the art of voluntary contortion to new heights - or do I mean depths? - as the form of the 1998 NSWSC Speleosports emerged even as the chrysalis from his back yard. However, the chrysalis NEVER had to contend with such obstacles in its search for a new life...

Some of the incredible things SUSS had to do to satisfy management:

- fence the entire area
- provide a $3000 bond to cover any grass damage
- have the area electronically scanned for u/g cable
- NOT use a vehicle to transport the obstacles to the site... etc

Keir's construction team included Matthew Hole, Don Matthews and I'm not sure who else.

As per tradition, the course started off with the team getting totally wet in the bathtubs - which numbered 4 instead of the usual
2. (One of them had very nice claw-foot legs.) The next was "find the key" - which was located in one of 4 buckets full of rather nicely pastel-coloured porridge... rinsing was required before the "gate" could be unlocked. Then came a short rope traverse between 2 trees before the "rope tangle". This was a masterpiece of awkwardness as the teams squeeze down a wooden tunnel in between a veritable tangle of rope (which became easier later in the day as some ropes came adrift due to continual abseil-device abrasion). 3 tyres were tossed into the remaining space for fun.

Then came the "mysterious Bermuda triangle of fear". From the outside, it just looked like a short, easily negotiable wooden triangular "tunnel". However, I'm pretty sure that competitors, once in, suffered an almost instantaneous and therefore practically undetectable bodily transition to Someplace Else. Because anyone who goes in a speleosports course is crazy anyway, no personality disorders were noticeable in those affected.

A "flowstone slide", requiring teamwork in some rather unusual positions in order to climb up it, led to "the doors": a series of doors with a small window cut in each, layered horizontally to form a continuous vertical Mammoth Squeeze (for those familiar with Jenolan). This led directly down into the "pet bottles", which was a cruel contraption indeed. It consisted of a large box with chicken-wire sides and wooden beams dividing the top into squeezable squares, the box internally divided by a wooden sheet vertically down the middle that started at the top but had a gap under which competitors crawled, from one side to the other. Not so hard? Try doing it when the box is half filled with empty pet bottles!

Next came "smash the stals", possibly as one of these student protests of large persons against the discrimination inherent in the notorious Bonwick helictite crawl. After some spirited smashing came the ladder climb (on belay) and abseil, followed by 1/4 of the team being hoisted up to sign the Visitors' Book, necessitating a descent through the "Tube of Terror" to the ground.

The "milk crate puzzle" held up many otherwise fast teams but, once through, it was a sprint to Keir's engineering marvel - the "flying fox". This took an inordinate amount of effort to construct for an efficient and safe trip, but I think it was much appreciated by the participants - or at least by the general and photographing public.

Team Results:

1st: *"Brian Henderson and the hair replacements"* - a mixed HCG/SUSS team of Jason Moule, Chris Norton, Rachelene ?? and Phil Maynard. Time - 11.01mins

2nd: *"Spirit of Pol Pot"* - a SUSS team of Matt, Carol, Russell and Christen. Time - 12.05 mins

3rd: *"Son of MUCG-Raker"* - a MUCG team of Jason Miller, Brad, Aggie and ring-in Jason Moule. Time - 14.39mins

SUSS also had the honour of the longest time at 29.09mins. However, Keir's team "True Heroes" (with Matthew Hole, Don Matthews and Carol Layton) came a respectable 4th.

Individual Events:

Jason Moule once again took out the honours in 5.38m minutes, closely followed by Chris Norton who came in 7 seconds behind Chris. There should be a law against it.

In an equally strong female field of 7 competitors, Carol Layton triumphed in the

time of 7.11 (I think). My source told me, in some surprise, that only the top three guys were quicker than she was. However, I feel that this is a perfectly natural phenomenon. Good onya, Carol!

Sponsors who donated prizes were:

- Wild Stuff
- Outdoor Life Group (Southern Cross, Mountain Equipment, Wildsports)
- Eastwood Camping Centre
- Sydney University Sports Union

Cave Rescue Squad provided (transported, set up and cleaned up) marquees and catering (from muffins to hotdogs). They expect, as usual, to make a small loss. As Chris wrote in a recent email, we should all be grateful that this volunteer organisation cares enough about the caving community to take part in this event.

But what about next year? MUCG are happy to secure the area around the Macquarie University gymnasium and look after any associated details, and several of the obstacles used in this year's event will be left at MUCG's cottage for use next year. So next year's event shouldn't be NEARLY as traumatic... What we need is a club (or a combined effort) to actually run Speleosports next year. Please give this your consideration, and let the NSW Speleo Council know. Thankyou!

[I apologise for any inaccuracies contained within, as this article was written in the space of 1/2 hr with no supporting shorts - Lucinda]

ASF MEMBER CLUBS ADDRESS LIST

[redacted]

Australasian Cave & Karst Management
[redacted]
kent@mail.austasia.net
Associate of ASF
National organisation

Australian Speleological Federation Inc.
(ASF)
PO BOX 388

[redacted]

Philip Holberton, (02) 6567 126
Corporate Member of ASF
[redacted]

Metropolitan Speleological Society Inc.
(MSS)
PO BOX 178
Thornleigh NSW 2120

[redacted]

Orange Speleological Society (OSS)

[redacted]

3911

[redacted]

Illawarra Speleological Society Inc. (ISS
PO Box 94
Unanderra NSW 2526
Corporate Member of ASF

[redacted]

8, (03) 633

[redacted]

Corporate Member of ASF

[redacted]

neers (STC)

[redacted]

THE ASF EXECUTIVE – 1998 / 1999

President
Peter Berrill

Senior Vice President
John Dunkley

Treasurer
Chris Riley

Secretary
Peter Dykes

Executive Secretary
Phillip Lardner

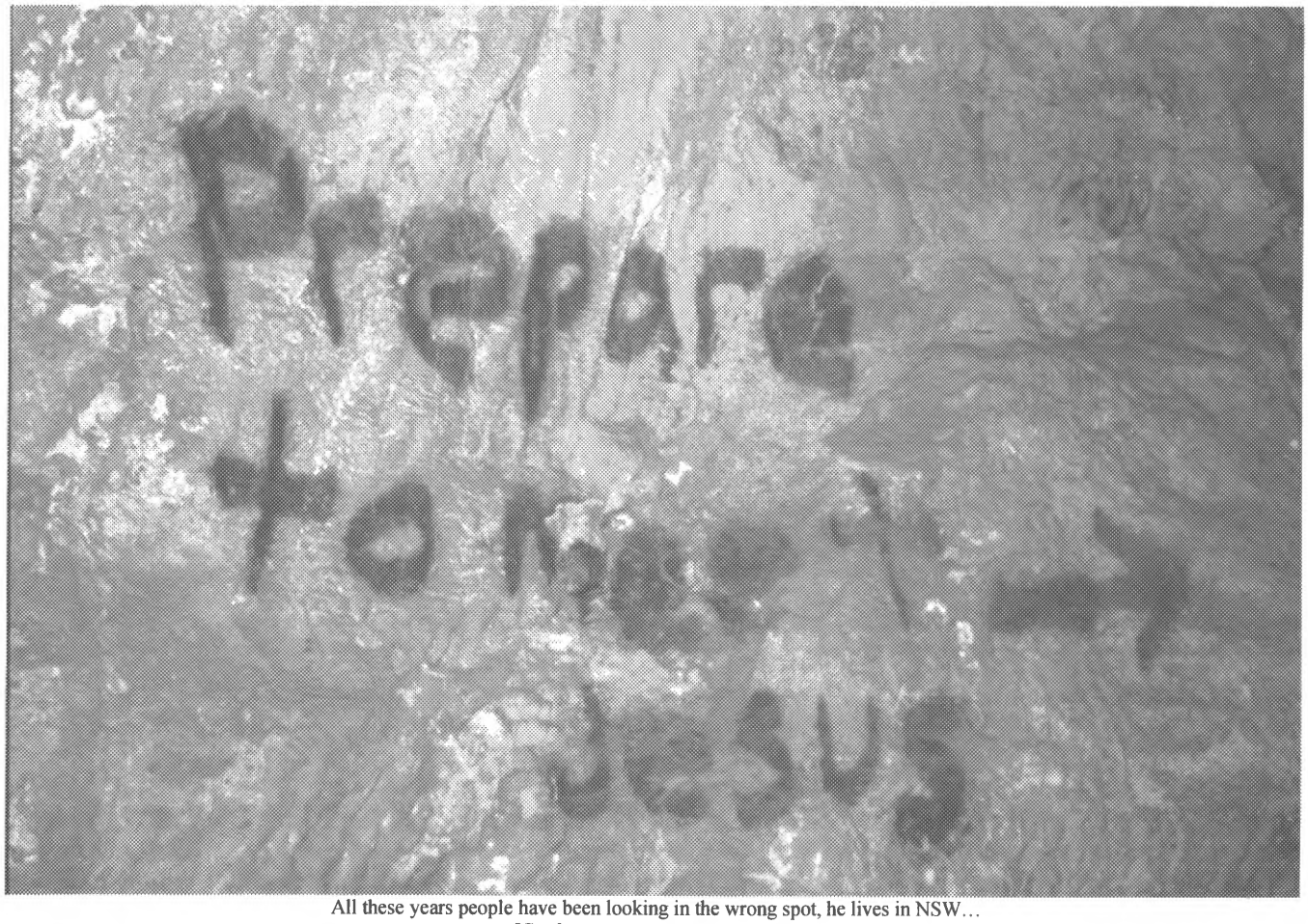
Membership Secretary
Angus Macoun

Vice President
Jill Rowling

Vice President
Arthur Clarke

Vice President
Harry Nagle

Ex-Officio Vice President
Kath Rowsell



All these years people have been looking in the wrong spot, he lives in NSW…
[Grafitti in Moore creek cave, NSW
Photo by Stefan Eberhard]