



# *Australian Caver*

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

**Issue No. 140, March 1997**



*Garry K Smith Photographing "The Claw" in Codrington, Victoria*  
*Photo by Garry's son – Michael Smith*  
*January 1995*



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

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The views expressed in the  
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**AUSTRALIAN SPELEOLOGICAL  
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PO Box 388, Broadway, NSW 2007

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## Editorial

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# Editorial

## Lest we forget...



My, my, my - aren't we an ungrateful bunch! It's only my second issue of being ASF Editor, and being

involved with the ASF has already transformed me from being "Mr Happy", to "Mr Miserable Bastard"!

I don't know how many of you read last issues Editorial where I stated *".....I can use that as an excuse for this issue being a bit below par in the quality stakes, as it was slapped together in a couple of days....."*

Obviously not many of you. (My guess is about three...).

I didn't realise I was actually doing a desktop publishing exam - which I have obviously failed!

I knew that the last issue had many flaws in the layout and presentation, but I wasn't fussed about them for my first issue, as getting it out as soon as possible was foremost in my mind. It was all a very rushed affair, so layout wasn't high on my list of priorities at the time. The Australian Caver is supposed to be a quarterly journal, but it had been around 18 months since the last one!

The thing is, I thought that people would be more appreciative about just *receiving* an issue after such a long period, and they'd forgive me for not worrying about those flaws in that one hurried issue. *"Surely they'll all give me a couple of issues as a "run in " period before they start criticising me."* I thought to myself? Huh, not much chance of that!

I was quite amazed at how many people went to the effort of writing letters or emails to me bagging the last issue. Wow! If only they'd put the same amount of effort into *contributing* towards the ASF...

Its no wonder members don't want to be involved on the ASF Executive if this is the treatment they receive.

I'm the first to admit that there were a couple of good suggestions amongst the nitpicking - like widening the text columns, page widths and things like that. But 90% of it was just personal comments - like they didn't like the font I used, or where I used italics, or the way certain bit's were laid out and that sort of garbage.

Personally, I don't give a toss about that sort of stuff!

I even went out of my way to make it look different to older issues, and I got bagged for exactly that,

making it different to older issues! Jeez...wouldn't the world be a boring place if we all did everything the same way...

If you have a genuine comment about how to improve the Australian Caver, or a suggestion for future issues, then please - let please let me know. That's what I am keen to hear from people.

But...

If you "personally" don't like a certain aspect of the Australian Caver, or want it to stay the way it always has in the past - then tell someone who cares, not me!!!

Oh yeah, one final point before you start writing your letters bagging me about this issue as well...

All of the photos in this issue (*with the exception of Gary's cover shot*) were already scanned and then emailed to me by the authors of the relevant articles. The quality of the reproduced photo is dependent on how well it was scanned in the first place - and some of them have not turned out that well. That will explain why some of the photo's aren't that brilliant in quality - *So don't blame me for it!!!*

Enough said...

Dean Morgan  
(Temporary?) Editor

## Contributions to Australian Caver

can be sent to me via email at <deanm@netspace.net.au> or sent via 3 1/2 inch floppy disk.

Preferably Word for Windows, Excel, Publisher, RTF, or ASCII formats, but anything will probably do.

Pictures can be in virtually any format, but jpegs, gifs, bmp's, and tiff's work best for me.

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

If you have no computer, then that's fine. Just send typed, scribbled, hand written, carved in rock slabs, courier, carrier pigeon -

Who cares, as long as I get it! My address is:-

The ASF Editor

17 Belhaven Ave, Tarooma

Tasmania 7053

*"Sure, it's going to kill a lot of people, but they may be dying of something else anyway."*

-- Othal Brand, member of a Texas pesticide review board, on chlordane.



## A letter to the editor, In reply to last issues letter to the editor...

The Editor Australian Caver  
Mr. Dean Morgan

Thank you for taking up the editorship of our national magazine and bringing us up to date about what is happening in Tasmania. Referring to your first letter to the Editor (*issue 139*), mention was made about using a tourniquet on a person suffering from snakebite. This procedure went out with Condyl's crystal washing machine and slashing and sucking the wound many years ago. The correct treatment is to bandage an entire limb using compression immobilisation with the person lying on the ground. But I am sure that everyone knows all about this from their last first Aid course.

Yours Respectfully  
Heather Caswell (V.S.A.)

# ASF ISSUES



## AUSTRALIAN SPELEOLOGICAL FEDERATION INC.

21st Biennial Conference,  
40th Anniversary  
1997 FLINDERS CONFERENCE,  
QUORN - South Australia.  
29 March - 3 April, 1997

### Program

#### **Date:**

Saturday 29/3/97  
Sunday 30/3/97

Monday 31/3/97  
Tuesday 1/4/97  
Wednesday 2/4/97  
Thursday 3/4/97

#### **Daytime:**

Registration  
Brachina Geological Gorge Tour & Prusik Challenge  
Opening Plenary  
Workshops & Field Trips  
Conference Plenary  
Workshops & Field Trips  
Speleosports & Farewell BBQ

#### **Evening:**

Welcome BBQ  
  
Great Debate  
21st Cavers Dinner

[Continued over page...]



**ASF Member delegates will be required to attend the ASF Council meetings scheduled:**

Saturday 29/3/97 9:00 A.M. to 4:00 P.M.

Thursday 3/4/97 1:00 P.M. to 5:00 P.M.

## REGISTRATION DETAILS:

*[See Registration form on the back page]*

### **FULL REGISTRATION:** \$175.00

Includes:

Day Conference	Days Field / Activity inclusive	Flinders Ranges Field Guide
Conference Papers	Welcome BBQ	Speleo-sports
Prusik Challenge	Morning & Afternoon Teas	Brachina Geological Gorge Tour
Conference Badge		

Deduct \$15.00 if Conference Papers & Field Guide not required. = \$160.00

### **PART-TIME (DAY) REGISTRATION:**

Registration Fee: \$60.00 Plus \$20.00 per conference day / plus \$5.00 if Activity Day.

includes:

Events of the Day(s) chosen	Morning & Afternoon Tea	Conference Papers
Flinders Ranges Field Guide	Conference Badge	

**PAYMENTS: CHEQUE / POSTAL ORDER to: ASF 1997 Flinders Conference**

*[Editors note:-Presented below are the ASF's Cave Diving & Free diving Codes of practice. These have been around for a while, but have never before been published. Thanks to Keir Vaughan-Taylor for forwarding them for publication.]*

## Australian Speleological Federation CAVE DIVING - CODE OF PRACTICE (1988)

### **BREATHING SUPPLIES**

- 1.1.1 Self-contained
- 1.1.2 Surface supplied
- 1.2.1 Supplies - solo diver
- 1.2.2 Supplies - buddy diving
- 1.3.1 Breathing medium
- 1.3.2 Breathing mixtures
- 1.4.1 Supply fixings
- 1.4.2 Independent supplies
- 1.5.1 Valve - solo diver
- 1.5.2 Valve - buddy diving
- 1.6.1 Pressure relief device
- 1.7.1 Unvalved fittings
- 1.8.1 Buddy diving - definition

### **LIGHTING**

- 5.1.1 Regulation
- 5.2.1 Primary lights
- 5.2.2 Back-up lights
- 5.3.1 Use of

### **LINES, REELS**

- 6.1.1 Type
- 6.1.2 Type - severe conditions
- 6.2.1 Continuous line
- 6.2.2 Marking - junctions
- 6.3.1 Permanent line - main passage
- 6.3.2 Permanent line - other

*"Sure, it's going to kill a lot of people, but they may be dying of something else anyway."  
-- Othal Brand, member of a Texas pesticide review board, on chlordane.*



**BREATHING APPARATUS**

- 2.1.1 Ratings
- 2.2.1 Contents gauge
- 2.3.1 Hose lengths - buddy diving
- 2.3.2 Excess hose (from 2.3.1)
- 2.3.3 Demand valve
- 2.4.1 Performance

**CONSUMPTION RULES**

- 3.1.1 1/3 Rule
- 3.1.2 Inflow current
- 3.1.3 Diver propulsion vehicles
- 3.1.4 Silt and restrictions
- 3.1.5 Compound rule
- 3.2.1 Buddy diving

**BUOYANCY**

- 4.1.1 Neutral Buoyancy
- 4.2.1 Dry suit

- 6.3.3 'Jump line'
- 6.3.4 Fixing
- 6.3.5 Markers - other
- 6.4.1 Reels
- 6.4.2 Newly laid line
- 6.5.1 Safety reel

**HELMETS**

- 7.1.1 Use of

**DECOMPRESSION**

- 8.1.1 Instruments, tables
- 8.2.1 Breathing supplies

**DIVE LOCATIONS**

- 9.1.1 Protocol
- 9.1.2 Other organisations

**DIVER STANDARDS**

- 10.1.1 Competence
- 10.1.2 Certification
- 10.2.1 Experience
- 10.2.2 Caution

**1. BREATHING SUPPLIES**

- 1.1.1 To be self-contained: 'Scuba'; or
- 1.1.2 If using an alternative supply, the diver must have an immediately accessible self-contained supply in accordance with 1.2.1 or 1.2.2. This self-contained supply is to be at least twice the volume required to exit from the dive.
- 1.2.1 A solo diver must have at least two Independent volumes both fitted with breathing apparatus; or
- 1.2.2 If buddy diving, each diver must have at least one own volume. If using one volume, it is to have two Independent valved outlets fitted with breathing apparatus in accordance with 2.3.1
- 1.3.1 The breathing medium must be such to support life and not to be toxic or excessively narcotic at the intended depth of dive.
- 1.3.2 If using other than dry breathing air, only gasses or mixtures of known repute are to be used.
- 1.4.1 All breathing supplies must be fitted with pack or fittings so that they may be worn or attached to the diver.
- 1.4.2 If the breathing supply is Independent of the diver (*i.e. supplies attached to sled or diver propulsion vehicles, etc.*) the assembly must have a suitable BUOYANCY arrangement so as to be easily maneuverable by the diver.
- 1.5.1 A solo diver must be able to operate the valve handles of his breathing supplies; or
- 1.5.2 If buddy diving, the valve handles must be at least accessible to be operated by the buddy.
- 1.6.1 Valves designed with a pressure relief safety device must be used within the safe working pressure of that device.
- 1.7.1 No breathing supply volume will be fitted with a contents gauge, or external hose, which is unvalved (*other than the solid cross member of an ideal manifold*).
- 1.8.1 If using breathing apparatus in accordance with 1.2.2 (*buddy divers*) the divers must be in close proximity to each other at all times during the dive. If the passage is so confined or conditions are such as to make buddy breathing awkward, then the divers should use breathing apparatus in accordance with 1.2.1 (*solo diver*).



## 2. BREATHING APPARATUS

- 2.1.1 Valve to regulator fittings must not exceed the manufacture's ratings. If using tank pressures exceeding 25 mPa, a threaded assembly should be used (*i.e. European DIN standard is preferred*).
- 2.2.1 Every breathing supply volume so connected to breathing apparatus must have a contents gauge.
- 2.3.1 If buddy diving, at least one demand valve is to be quickly accessible to the buddy. This demand is to be fitted with a long hose as follows: open passage cave diving - 1.8 metres; restrictive/single file cave diving - 2.1 metres. Using diver propulsion vehicles - 2.4 metres.
- 2.3.2 Any excess hose length can be restrained, however it must be quickly accessible if required as in 2.3.1.
- 2.3.3 If the primary demand valve is fitted with the long hose, then the backup demand valve must be quickly accessible to the diver (*a demand valve neckstrap is preferred using this method*).
- 2.4.1 Breathing apparatus must have suitable performance to supply demand at intended depth of dive and at user supply pressures and temperatures.

## 3. CONSUMPTION RULES

- 3.1.1 The absolute maximum volume to be consumed for penetration is 1/3 of any volume. Ideally this would allow 1/3 for return, and 1/3 for reserve; however, in less than ideal conditions or if using diver propulsion vehicles, then the following should be considered the absolute maximum for penetration:
  - 3.1.2 Penetration with inflow current: 1/4 rule.
  - 3.1.3 Penetration with diver propulsion vehicles: 1/4 rule.
  - 3.1.4 Penetration with less than favorable conditions e.g. silt or restrictions: 1/4 rule.
  - 3.1.5 Penetration with more than one of the above (*e.g. 3.1.2 and 3.1.4*): 1/5 rule.
- 3.2.1 If buddy diving, where divers are using single volumes (1.2.2), then each diver must allow an adequate reserve for their buddy. (*Consider that the buddy may have a greater consumption rate than the diver.*)

## 4. BUOYANCY

- 4.1.1 Every diver must have a means by which neutral BUOYANCY can be achieved at any depth or time during the dive.
- 4.2.1 If divers are heavily laden and/or wearing a dry suit manufactured from a non-buoyant material, a second, Independent BUOYANCY device should be worn.

## 5. LIGHTING

- 5.1.1 At least one primary (5.2.1), and two back-up (5.2.2) lights should be carried.
- 5.2.1 Primary light sources must have adequate light intensity, greater than 10 watts, and have a burn time at least equal to 1.5 times the dive time.
- 5.2.2 Back-up light sources must be capable of good illumination of up to 5 metres in clear water, with a burn time at least 3 times the dive time. One back-up light source must be kept with fresh or fully charged batteries for emergency use, the second back-up light source can be used for general use, however it should not show signs of light deterioration prior to a dive.
- 5.3.1 All light sources should be arranged to allow for hands-free diving. (*Lights can be mounted from an arm or helmet, however, powerful primary sources mounted from a helmet can cause back scatter of light which can be an annoyance to the diver.*)

## 6. LINES, REELS

- 6.1.1 Line, whether permanently fixed or retrievable, (*or reels*), can be floating or non-floating, but must have a breaking strain of greater than 100 kg.
- 6.1.2 Some cave environments will require a more substantial line, and one must be used accordingly.

*"Sure, it's going to kill a lot of people, but they may be dying of something else anyway."  
 -- Othal Brand, member of a Texas pesticide review board, on chlordane.*



**[Lines, reels continued...]**

- 6.2.1 Every diver or diving group must have a continuous line leading back to the commencement of the dive.
- 6.2.2 A mark must be placed at every junction so as to define the exit direction of the dive.
- 6.3.1 All permanent lines should be single continuous lines. The main line should follow the most accessible route through the cave system.
- 6.3.2 Alternate routes to 6.3.1, or side passages should also be single continuous lines, and not be connected to the main permanent line or other lines.
- 6.3.3 A 'jump line' should be used to provide a continuous line for the diver if using alternative routes or side passages. The 'jump line' is to be a retrievable line and must be removed when the diver returns to exit from the cave. (*Note the use of markers 6.2.2.*)
- 6.3.4 All lines whether permanently fixed or retrievable must be secured within the cave at regular intervals, and definitely as follows: a. just inside the entrance cavern of the dive; b. where there is risk of the line being swept or pulled into narrow fissures; c. distinct changes in the passage direction; d. where there is risk of the line fraying due to abrasion from sharp or rough rock, especially where there is strong flow.
- 6.3.5 Markers should be used as necessary to indicate the exit direction of the cave, usually near alternative routes or side passages.
- 6.4.1 Reels must be used as necessary to connect:
  - a. entrance of a cave dive to the start of the permanent line;
  - b. bridging a gap between permanent lines (*see 'jump line' 6.3.3*);
  - c. any other diving or exploration where there is no permanent line.
- 6.4.2 Any newly laid line must not be left as a permanent line unless the cave passage has been surveyed, or there is intent to survey it.
- 6.5.1 A reel containing approx. 30 metres of line should be carried as a safety reel capable of performing the following functions: a. as a line to search for a buddy who has strayed from a permanent line; b. as a line to search for the permanent line if for any reason the diver has become separated from it; c. as a source of line so that a repair to a permanent line can be made.

**7. HELMETS**

- 7.1.1 Helmets should be worn for all cave diving, and must be worn when using diver propulsion vehicles. Note that lights or brackets mounted on helmets should be so designed as to minimise line snagging.

**8. DECOMPRESSION**

- 8.1.1 Suitable elapsed time measuring device, depth gauge, and decompression schedules must be carried whilst diving. The decompression schedules must be strictly adhered to.
- 8.2.1 An adequate breathing supply must be available for 2 times the decompression schedule.

**9. DIVE LOCATIONS**

- 9.1.1 Divers must use correct protocol to the landowner or authority, so as to gain permission for access and diving. Refer also to the ASF Code of Ethics.
- 9.1.2 If necessary, an authority or certification from an organisation should be sought if the dive location is so controlled.

**10. DIVER STANDARDS**

- 10.1.1 Cave diving should only be attempted by competent and suitably certified divers with a minimum of 100 dives and who are also competent cavers with a minimum of 100 hours underground.



**[Diver standards continued...]**

- 10.1.2 It is highly recommended that a cave diving certification be gained from an appropriate organisation
- a) CDAA Cave Divers Association of Australia
    - 1. Experienced "Cave Diver"
    - 2. Penetration Diver
  - b) IANTD International Association of Nitrox and Technical Divers
    - 1. Experienced "Cave Diver"
    - 2. Sump Diver
- 10.2.1 Where recent cave diving experience is minimal or new equipment is to be used, all skills pertaining to cave diving must be thoroughly practiced at a safe open underwater environment.
- 10.2.2 If undertaking a cave dive into territory you have not previously dived, extreme caution must be exercised so that the dive is well within your own personal limits.#

XX

## Australian Speleological Federation

# FREE DIVING - CODE OF PRACTICE

(DRAFT)

Ron Allum

(12-4-1989)

Amended (31-12-92)

**DEFINITIONS**

- 1.1.1 Free diving
- 1.1.2 Supplied air diving
- 4.2.1 Masks

**METHODS & CAUTIONS**

- 2.1.1 Lines
- 2.1.2 High water levels
- 2.2.1 Trapped air pockets
- 2.2.2 Pressurised air pockets
- 2.2.3 Foul air pockets
- 2.3.1 Hyperventilation
- 2.4.1 Zero visibility
- 2.5.1 Equipment aids
- 2.5.2 Attaching equipment
- 5.2.1 Additional signals

**LINES**

- 3.1.1 Line strength
- 3.1.2 Lines to suit environment
- 3.1.3 Line replacement
- 3.2.1 One line per passage
- 3.2.2 Lines in divided passages
- 3.2.3 Securing lines

**EQUIPMENT**

- 4.1.1 Lights
- 4.1.2 Second light source
- 4.2.2 Goggles
- 4.2.3 Snorkels
- 4.3.1 Fins
- 4.4.1 Wetsuits
- 4.4.2 Weight belts
- 4.5.1 Dry suits

**SIGNALS**

- 5.1.1 Agreed signals
- 5.1.2 Suggested signals

**COMPETENCE & EXPERIENCE**

- 6.1.1 Treat with respect
- 6.1.2 Rescue call-outs
- 6.2.1 Competence in water
- 6.3.1 Prior training
- 6.3.2 Dive skills

*"Sure, it's going to kill a lot of people, but they may be dying of something else anyway."*  
 -- Othal Brand, member of a Texas pesticide review board, on chlordane.



- |       |                          |       |                           |
|-------|--------------------------|-------|---------------------------|
| 3.2.4 | Intermediate tie-offs    | 6.4.1 | Consider party experience |
| 3.2.5 | Secure line-ends         | 6.4.2 | Silting of sumps          |
| 3.3.1 | Laying new line          |       |                           |
| 3.3.2 | Secure new line to diver |       |                           |

## 1. DEFINITIONS

- 1.1.1 The use of breath-held free diving techniques to pass through (*sumps*) or into (*syphons*) waterfilled passages that do not have vertical access to an air surface overhead.
- 1.1.2 Cave diving using SCUBA or other supplied breathing apparatus is covered in a separate code, '*ASF Cave Diving Code of Practice*'.

## 2. METHODS AND CAUTIONS

- 2.1.1 Every free diver must use a line in accordance with Section 3 of this Code.
- 2.1.2 Caution must be exercised in the event of higher than normal water level, as a dive may become considerably longer than expected or the line may end before an air space is reached.
- 2.2.1 Air trapped in roof pockets should not be breathed or relied upon (*see 2.2.2 and 2.2.3*).
- 2.2.2 Air trapped in roof pockets can be at higher than surface pressures. If this air is breathed and held during ascent, the free diver risks barotrauma of the respiratory system.
- 2.2.3 Again, air trapped in roof pockets may be foul air.
- 2.3.1 Hyperventilation, to increase the free diver's breath holding capacity, is discouraged. The risk of drowning if the free diver were to black out from this practice is much greater in this environment.
- 2.4.1 The intending free diver must be prepared to encounter zero visibility when contemplating such a dive, even if the water at first appears clear.
- 2.5.1 The use of equipment to aid a free dive into an underwater passage should be considered if practical (*see Section 4*).
- 2.5.2 Hooks, opening clips or karabiners without screw-gates must not be used to attach equipment to the free diver as they increase the risk of entanglement.

## 3. LINES

- 3.1.1 Lines, whether permanently fixed or temporary, may be floating or non-floating. However, they must have a breaking strain exceeding 500 kg.
- 3.1.2 Some cave environments will require a more substantial line, which must be used accordingly and/or replaced more frequently.
- 3.1.3 Lines used by cave divers are usually lighter and should be replaced with one of an appropriate strength.
- 3.2.1 Only one fixed line should be used or left through any water-filled passage (*see also 3.2.2*).
- 3.2.2 In the case of a divided passage where both sections are negotiable, then a second line, well separated from the first line leading from the closest air space, is preferred rather than to use an underwater junction in the lines.
- 3.2.3 Any line must be firmly secured at each end above normal water level and well clear of any overhead projections.
- 3.2.4 Any intermediate tie-off that is used to avoid the line pulling into narrow restrictions must be easy to negotiate so as to avoid loss of direction or entanglement in zero visibility conditions.
- 3.2.5 Under no circumstances is a free end of line to be left unsecured.
- 3.3.1 Free diving into unknown sumps and/or sumps with no fixed lines must be done with a continuous line from the free diver leading back to the start of the dive.
- 3.3.2 A line can be laid by a free diver using a reel or it can be paid out by a surface party. Using either method, the line or reel must be made secure to the diver.



#### 4. EQUIPMENT

- 4.1.1 Lights must be of a type to be reliable in operation when submerged, preferably waterproof to the intended depth of the dive.
- 4.1.2 A second source of light should also be carried by free divers.
- 4.2.1 A mask is considered to be a beneficial aid - unless the free diver is reasonably experienced, a mask should be used for cave diving.
- 4.2.2 Goggles should only be used in the place of a mask for very shallow ducks or dives, as the diver cannot fully compensate for the change of pressure that occurs with increased depth.
- 4.2.3 A snorkel should not be used or attached to the face mask strap for free diving. It may have an application for moving along water-filled passage only where there is overhead air space.
- 4.3.1 Fins are also considered to be a beneficial aid as they increase the diver's stability and propulsion whilst underwater. They may be omitted for short and/or restrictive free dives.
- 4.4.1 Wetsuits can also be used to provide insulation to reduce body heat loss when immersed in water (*see also 4.4.2*).
- 4.4.2 A weight belt should be considered if using a wetsuit (*or other buoyant device*), so that the diver can maintain neutral buoyancy for the dive - this is especially important if full wetsuits are used.
- 4.5.1 Dry or semi-dry suits may be used in place of a wetsuit, as in 4.4.1.

#### 5. SIGNALS

- 5.1.1 A method of signaling the next diver should be determined if a party of cavers is to pass through a sump.
- 5.1.2 If no other signaling method is to be used, the following line signals should be adopted:
  - 1. One tug - repeated every 10 seconds until acknowledged. To be used to signal 'sump clear' or in reply, 'I'm ready to enter sump'.
  - 2. Two tugs - repeated every 10 seconds until acknowledged. To be used to signal 'stay put - I am returning' or in reply 'I will stay put'.
  - 3. Three or more tugs - 'I need help'.
- 5.2.1 If paying a line out to a free diver, the following signals are to be used in addition to 5.1.2:
  - 1. Continuous pull - 'pay line out'.
  - 2. Slack line - 'take line in'.

#### 6. COMPETENCE AND EXPERIENCE

- 6.1.1 Free diving is a potentially dangerous activity and must be treated with respect.
- 6.1.2 Consideration must be given to a call-out procedure to properly trained and equipped cave divers in the event that overdue free divers do not return or are trapped by increased water levels.
- 6.2.1 No person should attempt to free dive in a cave unless reasonably competent in water with another water-related activity or sport e.g. snorkel diving, surfing, etc.
- 6.3.1 If a person has no previous free diving in caves experience, then a training program should precede their first dive (*see 6.3.2*).
- 6.3.2 The following should be handled with ease before considering your first free dive into a cave:
  - 1. Follow line through underwater obstacle course.
  - 2. Using blackouts to simulate silting.
  - 3. Practice using and not using aids, as in Section 4.
  - 4. Practice use of signals, as in Section 5.
- 6.4.1 Consider the experience or inexperience of others if in a caving party about to attempt a free dive.
- 6.4.2 Remember, a clear sump will silt when the water is disturbed eg. by a free diver entering or moving through the water. This will make a return or a subsequent free diver's pass much more difficult.#

XX



# The ASF's budget report

Compiled by Chris Riley (your faithful ASF Treasurer)

## INCOME:

Members	Number	Insurance	Fees	Revenue
ordinary	445	\$1,335.00	\$4,227.50	\$5,562.50
family	136	\$408.00	\$2,312.00	\$2,720.00
student	81	\$243.00	\$486.00	\$729.00
<b>Total</b>	<b>662</b>	<b>\$1,986.00</b>	<b>\$7,025.50</b>	<b>\$9,011.50</b>
associate clubs	9			\$495.00
individual	10			\$350.00
<b>Total</b>				<b>\$9,856.50</b>

## Insurance Number Revenue Corporate

individual	362	\$2,534.00	
family	106	\$1,484.00	

others

<b>Totals</b>		<b>\$4,018.00</b>	<b>\$1,986.00</b>	<b>\$6,004.00</b>
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**GRAND TOTAL** **\$13,874.50**

Revenue - Expenditure \$24.50

## EXPENDITURE:

item	unit price	No off	cost
Newsletter <sub>1</sub>	\$3,600.00	2	\$7,200.00
Executive Teleconference	\$250.00	2	\$500.00
Executive Expenses	\$850.00	1	\$950.00
Insurance <sub>2</sub>	\$4,200.00	1	\$4,200.00
Commision Expenses	1000	1	\$1,000.00
<b>Total</b>			<b>\$13,850.00</b>

Membership Fee Table				
Corporate		Fee	Discount	Payable
	individual	\$19.00	\$6.50	\$12.50
	Family	\$30.40	\$10.50	\$20.00
	Student	\$13.30	\$4.75	\$9.00
Individual		\$35.00		\$35.00
Associate		\$55.00		\$55.00

Discount available if paid before 30th June

Insurance Option - Table		
Corporate	New	
	Individual	\$7.00
	Family	\$14.00
	Continuing	
	Individual	\$5.00
	Family	\$10.00

The budget presented here is the projected budget for the financial year 97-98.

Figures for the membership are taken from 1996 membership and should not change dramatically.

Newsletters/journal printing will be regular and reliable. Costing for the newsletters are the cost of the last edition and the editor does not think this will decrease.

Yes we do have some extra cash as the last few years have been dry of print, this issue (No. 140) and the last issue (No. 139) will cost over \$7 000 and will eat a hole in that extra cash.

### Note: 1.

- There are only 2 editions of Australian caver allowed in this budget. A budget for the provision of 4 issues is presented as budget 2

"Living on Earth may be expensive, but it includes an annual free trip around the Sun.

-- Anonymous



•Some ideas to think about:

- Have a mixture of newsletter and smaller news bulletins
  - Waive the discount for paying 6 months in arrears
2. •Insurance could rise to the value of \$10 000 or more this would mean an increase in the fee component of \$3 and to individuals for club insurance of \$3. This brings the non discounted ordinary membership to \$22 and \$10 for club insurance.
- This scenario will only occur if there is a rise in the cost of insurance. Remember - it has to happen soon.

## BUDGET 2

### INCOME:

Members	Number	Insurance	Fees	Revenue
ordinary	445	\$1,335.00	\$8,455.00	\$9,790.00
family	136	\$408.00	\$4,352.00	\$4,760.00
student	81	\$243.00	\$972.00	\$1,215.00
<b>Total</b>	<b>662</b>	<b>\$1,986.00</b>	<b>\$13,779.00</b>	<b>\$15,765.00</b>
associate clubs	9			\$585.00
individual	10			\$450.00
<b>Total</b>				<b>\$16,800.00</b>

Insurance Number	Revenue	Corporate
individual	362	\$2,896.00
family	106	\$1,696.00

others			
<b>Totals</b>	<b>\$4,592.00</b>	<b>\$1,986.00</b>	<b>\$6,578.00</b>

**GRAND TOTAL** \$21,392.00

Revenue - Expenditure \$442.00

### EXPENDITURE:

item	unit price	No off	cost
Newsletter <sub>1</sub>	\$3,600.00	4	\$14,400.00
Executive Teleconference	\$250.00	2	\$500.00
Executive Expenses	\$950.00	1	\$950.00
Insurance <sub>2</sub>	\$4,200.00	1	\$4,200.00
Commision Expense	\$900.00	1	\$900.00
			<u>\$20,950.00</u>

Membership Fee Table				
Corporate		Fee	Discount	Payable
	individual	\$28.50	\$6.50	\$22.00
	Family	\$45.60	\$10.60	\$35.00
	Student	\$19.95	\$4.95	\$15.00
Individual		\$35.00		\$45.00
Associate		\$55.00		\$65.00

Discount available if paid before 30th June

Insurance Option - Table		
Corporate	New	
	Individual	\$8.00
	Family	\$16.00
	Continuing	
	Individual	\$5.00
	Family	\$10.00

"Sure, it's going to kill a lot of people, but they may be dying of something else anyway."  
 -- Othal Brand, member of a Texas pesticide review board, on chlordane.



# ARTICLES

## Cave Vandalism by Cavers

by Rauleigh Webb  
ASF Conservation Officer (WA)

*The ASF adopted a Minimal Impact Caving Code (MICC) in 1992 and one of the major suggestions in that code is the use of track/route markers in sensitive caves that are likely to be easily damaged by cavers*

### Why Use Track Markers

The concept is very simple. If you have a low energy cave system that is virtually unchanged for thousands of years and the cave is not inundated with water, and/or has no active waterflows or external energy placed into the system; then it is VERY easily damaged by cavers simply walking in the cave. If a path/route is marked in a cave and you stay on the route, then your impact on the remainder of the cave is negligible. Without the route/track cavers walk all over the floor and search everywhere for the way on through the cave. This leads to damage in all parts of the cave. With a single path all of the damage is confined to the path.

In very sensitive areas with fragile decoration, easily disturbed sediments, significant cave life etc, etc, the impact of cave visitors is minimised by using a path.

Already a number of caves on the Nullarbor Plain have been track/route marked to minimise the damage that could occur to these caves in the future. In the case of Gorange Cave, persons unknown removed a considerable quantity of the track marking. On my last visit to the cave considerable damage had occurred as a result of the lack of track marking. Cavers had severely damaged virgin sediments and in crawling unnecessarily amongst heavy decoration, a number of formations had been damaged.

In the case of Old Homestead Cave, significant quantities of cracked mud floors still exist throughout the "main drag" in the north cave. If the track marking were not present this magnificent floor would almost certainly have been destroyed.

Sentinel Cave was found within the last two years and the survey team from the Speleological Research Group of WA (SRGWA) route marked the cave (5/2/96) to minimise the spread of considerable quantities of bat guano in the cave. Unfortunately, once again persons unknown have now (*by Easter 1996*) COMPLETELY removed all route markers from the cave. This is an act of cave vandalism, for which those responsible will have to live with the knowledge that they deliberately damaged the cave. Already the cave has suffered, as the "track" within its large passages is not at all obvious, leading to cavers walking all over the floor and spreading bat guano across the calcite decoration. I can only implore cavers not to remove track/route marking but rather to maintain such marking to minimise our impact on the cave.

Another cave, Anzac Cave, has also had track marking removed. This cave was track marked by the survey team (7/2/96) from SRGWA. A loop was placed in the cave so that visitors could see the majority of the delicate decoration while minimising the risk to the cave floor and the decoration.

If someone would like explaining to me why the markers were removed, I would be very interested to listen to the explanation.

### What are the Disadvantages of Track Markers

Many cavers complain about the visual pollution of track/route markers in a cave. "I can see the damn things everywhere disappearing in the distance". **I cannot agree more!!** As visual pollution they are terrible!! HOWEVER, this visual pollution is ensuring that if cavers are able to stick to the trail or



route, then the majority of the cave remains undamaged. Surely the visual pollution is nothing if the physical damage to the cave is reduced from 90% (*the entire floor*) to 10% (*the track*)? If the track is that heavily worn then eventually the track markers may be removed - impact on the cave - ZERO!! Think about it.

Another potential impact on the cave is the use of metal track markers. The aluminium disks manufactured by SRGWA are great in "dry" caves when attached to plastic. In Old Homestead Cave a number of them have been nailed onto rocks and the reaction of the nail with the aluminium produces a gooey mess that is polluting the cave. If track markers made completely of plastic are used, then the impact of the track marker on the cave is considered negligible.

### **What is the Cost of Track Marking**

Purchasing track markers is not a very expensive exercise. With about \$70 of track markers almost any of the medium sized caves of the Nullarbor could be track marked. However, if you consider the cost of getting the track markers to the Nullarbor, and then cavers time in installing the markers, the cost suddenly escalates. In order to reduce the impact of surveying on Carlisle Cave, a considerable number of track markers were used to keep feet from the coffee and cream. Furthermore - a high quality distance measuring device was hired (\$500) to ensure that splays to walls did not require anyone to walk to the walls. If a lead was possible then a single caver

examined the lead via the least sensitive route to the lead. This is called minimising impact!

What did it cost to track mark Sentinel and Anzac caves? Estimated cost \$600. Now with the track marking removed that cost doubles to replace it. If cavers continue to remove track markers then the cost/time wasted track marking in vain is likely to have considerable management implications.

### **Management Implications**

Cave managers are responsible for your actions underground. If we as cavers take ill considered actions and damage a cave, then ultimately the cave manager is at fault for allowing us access to the cave they manage. If cavers cannot even manage to stay on a marked trail, let alone removing it and thereby causing damage to the cave - how can cave managers continue to give them access to these extremely fragile NON-RENEWABLE resources?

If I were a manager viewing these actions, I would be removing all access privileges (*and yes it is a privilege - not a right!*) to caves within my control. It would then take a powerful argument to convince me that cavers previously damaging the caves had reformed and should have access privileges restored.

Let's think long and hard about this issue. Cave managers are watching and await our future actions. Let's show some responsibility and abide by the Codes of Ethics and Minimal Impact that our Federation prescribes.

Rauleigh Webb  
ASF Conservation Officer (WA)  
21/2/97

# **CAVE GATING**

## **An integral part of a cave management plan**

*Heather Jefferies*

*Speleological Research Group of Western Australia*

### **1. INTRODUCTION**

The question of whether or not to gate a cave has historically proven to be a contentious issue, and one that concerns both cave users and cave managers.

- 1.1** Visitation pressures on most well-known caves have increased over recent years, and this trend is expected to increase as the public's attention is focused upon caving through cave

*"Sure, it's going to kill a lot of people, but they may be dying of something else anyway."  
-- Othal Brand, member of a Texas pesticide review board, on chlordane.*



education program's set up by various land managers (*such as the Caveworks "Ecomuseum" at Margaret River, W.A.*)

- 1.2 "Adventure Caving" by both commercial and non-commercial groups is an activity which has also seen a great increase in the last 10 years. This also focuses public awareness upon caving experiences outside of the range of guided trips presently offered by Land Managers.
- 1.3 Cave gating must be seen as only one part of an integrated cave management plan. Gating may be undertaken for a variety of reasons. Prior to the formulation of any cave management plan involving the gating of a specific cave, equal consideration must be given to both side of the cave gating argument;

## 2. WHY GATE CAVES?

- 2.1 Principally, cave entrances are gated to limit the intentional and the unintentional damage that inevitably occurs when there are no limitations on visitation of a site. "Intentional" damage considers acts of both vandalism and indifference. "Unintentional" damage considers the damage that occurs by accident and by those uninformed about cave environments and requirements. Accidental damage is an inherent quality of even the most cautious and experienced of caving groups.

Damage within a cave may occur to;

- i) formations
- ii) specific fauna and their associated ecosystems
- iii) the cave environment itself.

The unique nature of caves presents special problems with respect to any potential or actual damage that may occur;

- i) Formations sometimes take many thousands of years to form; damage may therefore be irreparable, at least on human time scales.
- ii) Fauna and their ecosystems survive within caves at a tenuous level; even trivial damage may upset the fine balance, disrupting ecosystems and endangering fauna.
- iii) The cave environment is the sum interaction of a number of different factors (*including air and water flow, humidity, temperature, etc*). Even the most innocent disruption to one aspect of the cave environment (*such as the gating of a cave interfering with cave airflow, or the excessive tramping of a mud floor*) may potentially result in a devastating and widespread effect upon the whole cave environment.

- 2.2 The gating of a cave (*or cave section*) may be a logical step in the management of a specific cave. Accordingly, gating of a cave (*or section of a cave*) may be appropriate if the cave;

- i) possesses significant decoration or features, which are vulnerable to damage from open visitation.
- ii) possesses fauna deemed significant, and which are vulnerable to damage from open visitation.
- iii) environment is assessed as fragile, and vulnerable to damage from open visitation.

In these cases, the gating of a cave or section may be appropriate, and should be considered if other cave management procedures would not, or have not been successful in preventing such damage.

Caves may be deemed capable of supporting limited visitation. Implementation of concurrent alternative cave management processes (*for example, track-marking, interpretive sign posting etc.*) can facilitate minimisation of the impact of limited visitation. In these situations, the gating of a cave may present a sound means by which visitation numbers can



be limited. Gating will facilitate cave use in "a manner and quantity consistent with the preservation of the resource".<sup>(1)</sup> Regular assessment of the impact of such visitation should then be implemented (*see sections 4.6, 5.4*), the results of which may enable alteration of visitation numbers accordingly.

These following reasons for gating caves are secondary arguments;

- 2.3** Caves, by their nature, present a potentially dangerous environment. The very nature of the features within a cave present risks to cave users. Mazes, vertical pitches, water, loose rocks, and CO<sub>2</sub> present potential hazards. It then follows that cave gating (*as one aspect of an integrated management plan*) may then be advisable in order to decrease the risks presented to inexperienced cave users.

Cave gating, and the regulation of visitation through, for example, the permit system already in place in the Leeuwin - Naturaliste National Park is one method by which to ensure that groups entering a cave possess the specific skills required for each individual cave. (For example; possession of vertical roping skills, an appropriate degree of caving experience, etc). In this manner, gating allows regulation of the "**quality**" of the cave user.

- 2.4** Gating of caves which may present a potential risk to cave users, and the land managers may see the regulation of access to these caves as a form of risk-minimisation or risk-prevention. As such, they may in some part decrease their liability should a caving accident occur.
- 2.5** The gating of caves, and the regulation of access would allow archaeological/scientific research to be conducted relatively uninterrupted, and without intentional or unintentional interference.
- 2.6** Cave gating facilitates and enhances the effectiveness of a "user-pays" access system, which is capable of generating funds. All funds from the Permit System currently in place within the Leeuwin-Naturaliste National Park are utilised specifically for cave restoration and management.

### 3. WHY NOT GATE CAVES?

- 3.1** Cave gating may be unnecessary. Gating will not significantly decrease the risk to cave or cave user if;
- i) the cave does not possess valuable or vulnerable decorations/ fauna/ ecosystems/ environment.
  - ii) the cave does not currently receive significant visitation. (*This may be a function of the location of a cave, how conspicuous the cave entrance is -including the degree of bush cover present, and the degree of public knowledge concerning the cave*).
  - iii) the cave does not possess a significant risk to cave users.
- 3.2** Effective gating of a cave may be too costly. Gating the entrances of many caves could be expensive exercises in logistics. The limited management funds available may be better used implementing other cave management strategies.
- 3.3** Gating the entrance to a cave may potentially restrict airflow within the cave system. This can result in a marked change in cave temperature pattern and in this manner alter the cave environment. Ecosystems may accordingly be altered.
- 3.4** The gating of a cave may be counter-productive. It may sufficiently provoke some individuals as to encourage them to vandalise or remove the gate. The cave may be liable to suffer as a result of these actions. In this form, gating may serve to **increase** visitation to a cave, and therefore in itself, gating presents a potential risk to a cave.

*"Sure, it's going to kill a lot of people, but they may be dying of something else anyway."*

*-- Othal Brand, member of a Texas pesticide review board, on chlordane.*



- 3.5 Gating may be considered to limit the rights of the individual to visitation of specific caves. *(In actuality, as in the Leeuwin-Naturaliste National Park, this right is limited by Permit Systems already in place.)*
- 3.6 A cave gate is by its nature an unnatural structure; thus gating can be seen as an intentional "vandalism" of a cave; an act which may potentially damage the cave entrance, as well as the fauna and flora resident there.
- 3.7 Cave gating will limit (*unofficial?*) group access to a cave. Commercial groups may consider that they may suffer financially as a result of this action.
- 3.8 Gating may potentially limit access to part-time cave occupants such as birds and bats.

#### 4. CAVE GATING AS AN INTEGRATED PART OF A CAVE MANAGEMENT PLAN

Cave gating is certainly not the only, and often not the most appropriate form of management strategy which can be implemented to protect a cave and its environment. There are many alternative management options available that indeed may be more effective. Gating is viewed by some individuals as prohibitive, and as such, alternatives to gating may be considered more "user-friendly".

- 4.1 Appropriately based interpretive signs are essential in any cave management plan. Placement of these signs is just as important as their content. Placement inside a cave can serve to produce a "conspiratorial" attitude of caring for the cave. Inside placement also ensures information is supplied to caving parties at relevant points in the cave, and thus maximises the effectiveness of such signs. Conversely, interpretive signs outside a cave may be detrimental in that they;
  - i) draw unnecessary public attention to the cave
  - ii) may be inadequately read in the rush to "get in"
  - iii) may be forgotten in the course of the trip
  - iv) may provide a challenge to some individuals (*the vandals*)

As mentioned previously, alternative management strategies may be *more* effective than gating, as is the experience in Hollow Hill cave in New Zealand. In this cave, rather than gate the entrance - interpretive signs have been placed at a position a considerable distance into the cave, but at a position immediately prior to a section where mud poses a risk to formation. This sign alone has proven extremely effective in co-opting cave users to protect the valued decoration from the effects of the mud.

- 4.2 Appropriate track marking, which is informative yet aesthetic can reduce or prevent visitation to sensitive areas, whilst not detracting from the cave experience.
- 4.3 Some form of regulation of access (*numbers and quality of cave users*) may be essential in a Cave Management Plan. This system of regulation can be on a small scale, for example, the controlling of a single cave, or on a large scale; for example, the Permit System of the Leeuwin-Naturaliste National Park.
- 4.4 Proximity relays at the entrance of a cave may be an effective and less costly alternative to gating. However, unless these relays are set to provide only a visual +/- sound deterrent to the undesired cave user, such a system would require the proximity of some form of supervision.
- 4.5 Gating of a cave cannot be seen as a management strategy in itself. Rather, it needs to be conducted as part of an integrated management plan. Furthermore, once gated, a cave inevitably requires further management measures be implemented, for example, to direct traffic away from vulnerable areas. Gated caves still require some system in place to decide who, and how many people gain access to the cave.



Experience in other parts of the country suggests that gated caves are most effective when they are in close proximity to some form of supervision (*for example, in the Jenolan Caves region*). This serves as a deterrent to individuals to dismantle/remove/vandalise any gate (*such as has occurred at Tantanoole Lake Cave, S.A., a rather isolated cave where vandals drove off with gate attached*), and also allows a degree of supervision of the sites.

- 4.6 Once gated, the management plan for a cave must include regular Limits of Change surveys in order to assess the effectiveness of gating and other management plans. According to the results of such surveys, strategies may be altered, discontinued, or commenced as required. Visitation numbers may be altered in accordance with results.

It goes without saying that in order for a Limits of Change survey to be relevant, the appropriate cave inventory and survey must be conducted prior to gating, in order to provide baseline data.

## 5. CONSIDERATIONS PRIOR TO THE GATING OF A CAVE

Each cave must be considered on an individual basis; furthermore, the gating of a cave must be considered for its effects upon other caves within the region- for example, how the gating of a particular cave may effect visitation patterns to other nearby caves.

In any region considering an overall management plan which includes the gating of some caves, gating priorities must be set:

### 5.1 SETTING PRIORITIES

- Which caves are the most valuable, and which of these are most vulnerable to visitation? (*Cave surveys and inventories will provide this data*)
- Which of these caves receive the highest rate of casual visitation? (*Visitation surveys will provide this data*)
- Which caves are already somewhat protected by their location, or their inconspicuous nature?
- Which caves in the region provide the most significant risks to cave users.

### 5.2 CONSIDERING INDIVIDUAL CAVES

- Is it logistically possible to gate the cave?
- What are the management objectives for this cave, and will gating meet these objectives?
- Would other management strategies be more effective for this cave?
- If gated, what additional management strategies will need to be implemented?
- Will gating adversely affect the cave environment or ecosystems?
- Will installation cause significant damage to the cave in any way? (*And will the benefits of a gate outweigh this damage?*)

### 5.3 GENERAL CONSIDERATIONS

- Is there enough money to gate the cave(s) required?
- Are the gating priorities for the region clear?
- Has the management body (*in this case, CMAC*) approved the gating procedure?
- Who will construct and install the gate?
- Who will conduct maintenance once the gate is installed?



#### 5.4 FOLLOW-UP

As mentioned previously, regular Limits of Change surveys will be required after a gate has been installed in order to assess the effectiveness of that specific intervention, as well as they other strategies implemented within a particular cave.

#### 6. PROCEDURE FOR THE LOCKING OF A CAVE

- i) Gather all available data on the cave, then if necessary
- ii) Conduct a cave inventory and survey, and a casual visitation survey
- iii) Formulate clear management objectives for gating the cave
- iv) Outline the expected gating impact upon the cave
- v) Submit a written application (*outlining i & ii*) to the local cave management authority, (+/- *interested parties such as Caving Clubs*)
- vi) Parties such as Caving Clubs may then make relevant proposals to the appropriate management authority
- vii) The management authority recommendations are then submitted and acted upon.

#### ALTERNATIVE PROCEDURE FOR THE LOCKING OF A CAVE

- i) The management authority canvasses clubs for suggestions on gating priorities, or concerning the gating of a specific cave.
- ii) These suggestions are brought back to management authority and the decision is made at this time.

#### RECOMMENDATIONS

1. Before considering the gating of a particular cave or the setting of gating priorities by the management authority, background data with which to work must be obtained. It is strongly recommended that the management authority consider obtaining the services of groups or individuals, paid or unpaid, to conduct the necessary surveys ie.;

- i) casual visitation survey
- ii) cave survey and inventory

Without this data forming the basis of decision making, any action with respect to cave gating will be uneducated and amateurish, and may result in unintentionally causing *more* damage to a cave(s) within the region.

2. By the very act of gating a cave, it is suggested that to breach a gate is trespass of some form. It would also be an act of vandalism. Without the appropriate penalties for such actions, gating may be ineffective. Provision of some form of supervision for the gated caves of the region would potentially increase both the effectiveness of cave management strategies, and decrease the incidences of vandalism (*both to gates and to caves themselves*). Therefore, it is strongly recommended that prior to considering further gating in the region, the management authority initiate appropriate penalties for cave / gate vandalism, and also strongly consider appointing a full time ranger whose duties are dedicated specifically to caves.
3. An entrance impact study must be conducted before gating any cave, in order to assess the impact of the gating not only to the cave in question, but also *to all the other caves within the region*.

#### REFERENCES

Hunt, G., Stitt, R.R. (1981) *Cave Gating : A Handbook*  
National Speleological Society: Huntsville, Alabama (p.1)



## ACKNOWLEDGMENTS

N. Poulter (SRGWA)  
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E. Hamilton-Smith  
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# CAVER LOST at YARRANGOBILLY

Written by Garry K. Smith.

As published in *NEWCAVES CHRONICLES* No. 7, July 1996

*Details of the search and rescue as told to me by John Bonwick, which he recalled from conversations with Fred Stewart. Also, some details were supplied by Henry Fairlie-Cunninghame. It appears that this true story has never been fully documented apart from a few sketchy newspaper reports. Many thanks to staff of the Newcastle City Library for supplying newspaper articles from their archives.*

References:-Sydney Morning Herald (16-12-1953, P.1), (17-12-1953 P.1),  
(18-12-1953 P.1), (Canberra Times, 18-12-1953)

## The year was 1953.

Frederick Stewart and Brian O'Brien, had just finished their university exams before embarking on a Yarrangobilly caving trip, designed to help them unwind from the stresses of the academic year. They were members of Sydney University Speleo Society (SUSS) at the time, and were considered experienced cavers by their colleagues. During Monday the 15th Dec 1953 they explored the West Deep Creek Cave. Emerging late in the afternoon, they began the walk back to camp. On the way they passed the entrance to East Deep Creek Cave. Fred said to Brian, "lets have a quick look through this cave". Fred knew the cave reasonably well, so he led Brian down into the depths of the cave till they reached the sump. Realising that their carbide lamps would be running low and there was no spare carbide, they began hurrying back through the cave toward the entrance. Fred led the way,

occasionally glancing over his shoulder to check that Brian was keeping up. As they climbed the last section above the river passage, Brian lagged behind. Fred continued on thinking his companion was close at his heels.

Realising that he was getting a bit behind, Brian began to hurry and missed a crucial turn in the exit route. The passage he was following lead further away from the exit, but he pushed on at an even faster pace believing he would catch up to Fred. Brian had squeezed through a foot square gap in some rocks and entered an unknown section of the cave. He later said, "I saw an opening and walked further into the cave to find a way out".

Upon reaching the entrance, Fred waited expecting his companion to appear shortly. Time passed but there was no sign of Brian. Fred then went back into the cave

looking for his companion. There was no sign of Brian even past the point where they had previously been together. This puzzled Fred so he went back to the entrance.

Meanwhile Brian had pushed on at a faster pace until his only light source (a carbide helmet lamp) failed, so he took off his woollen beanie and lit it. With this makeshift torch he moved on further into the previously unknown section of cave. Eventually his beanie was all burnt, so he sat down in the dark, listening to the eerie sound of water drops echoing in the total blackness. (*The Sydney Morning Herald reported that O'Brien used only a battery lamp on his helmet as a carbide lamp hindered him while climbing, but the Canberra Times quotes O'Brien as having an Acetylene light.*)

Fred once again went back into the cave, pushing further this time in search of his mate. He yelled out on

*"Sure, it's going to kill a lot of people, but they may be dying of something else anyway."*

*-- Othal Brand, member of a Texas pesticide review board, on chlordane.*



many occasions but there was no reply. Once again he climbed back to the entrance. By now Fred was in a real quandary as to what should be done. He decided that the best course of action would be to get help. He wrote a note telling Brian to wait at the entrance if he came out, then Fred tramped over the plateau to Yarrangobilly tourist cave complex. A rescue group made up of Cave Guides was dispatched. They searched the cave but could not find any sign of Brian, so the police were informed. Next morning reports of "Student Lost While Exploring Cave" were splattered over the front page of Newspapers. Assumptions, possible scenarios, exaggerations and ignorance were sensationalised in media reports of the time. "Sergeant W. McDougall, of Adaminaby police, who is in charge of the search, said there was a 160 ft deep fissure in the floor of the cave. We think he may have climbed out through one of many fissures, which lead to the surface. Once at the surface he could have got bushed...or become delirious, wandered to the road and was picked up by a passing car. "A Sydney scientist who had explored the caves with Fred and Brian a few months prior was quoted in the Sydney Morning Herald (17-12-53) as saying, "In one place, the whole ceiling, about 40 feet above us, looked ready to come down at any minute. We slithered past the spot as smartly as we could and didn't raise our voices above a whisper. A shout could have set up a vibration which would have brought the lot down on top of us." Henry Fairlie-Cunningham (*then President of SUSS*) and Peter McGregor (*SUSS*) arrived that morning after driving through the night from Sydney. They thoroughly searched the extent of the known cave down to its sump and into the side passage up to and around the rockpile. They discounted any chance that Brian

could have even gone up into this section as it was dry and dusty, completely different to the clean rocks and mud sections of the exit route which more-or-less followed the underground stream. During Tuesday and Wednesday, Police, Snowy Mountains Authority workmen and members of the Speleological Society carried out extensive searches of the cave and surrounding area.

The real problem arose when rescue groups considered the strong possibility that while Fred was away getting help, Brian may have come out of the cave in a delirious state, collapsed on the plateau or fallen into another cave. For three (3) days rescuers searched the surrounding countryside and numerous caves.

Fred later talked about the police of the day being under equipped and not adequately trained for cave search and rescue emergencies.

Canberra Speleos came to help. They decided to start with a thorough systematic search of East Deep Creek Cave. They eventually began searching the dusty side passage and rockpile where Brian had taken the wrong turn. They found a footprint on the rocks and began following this trail. Upon penetrating a twisted path through the boulders, they broke through into the previously unknown section of cave. Continuing on through several chambers and sections of passage they stumbled upon Brian, sitting, waiting. He was in a fit and healthy state, having survived the three days atop of a large rock in a spacious cavern. His first words were reported to have been, "I'm sorry for the fuss I've caused, but I think I have found a new cave". He later told rescuers, "I was very cold and had to keep moving about to keep warm. I only had about half an hours sleep during the whole time because of

the cold." Rescuers had only an orange and piece of chocolate with them when Brian was found. Strangely Brian had thought only two (2) days had elapsed.

At 4:30 pm on the third day (17th Dec 1953), O'Brien was found by rescuers, he was able to walk, crawl and climb unaided back through the cave to the entrance. Emerging at 5:30 pm, none the worst for his ordeal, short of a good meal.

A group of SUSS members were on their way to help in the rescue, however upon reaching Goulburn and seeking out the local Police, they were informed that Brian had been found safe and well.

So what do we learn from this misadventure!

- Always cave with a minimum group of 4 people.
- Always carry sufficient light sources. (3 separate sources).
- Always stay together as a group, either in voice or eye contact of each other.
- You can survive on cave water for some time, provided you protect against hypothermia.
- Don't assume that everyone has the same agility or climbing abilities as yourself.
- Don't believe everything you hear or read in the media.

In hindsight, it would have been wise for Fred to place a number of lightweight sticks over the entrance before going back into the cave or leaving to get help. If Brian had emerged at the entrance the sticks would have been disturbed, thus indicating that he was out of the cave.



## Speleological Research Group of Western Australia Inc.

### A Standing Ovation to **NORMAN POULTER**



**Norm receives his certificate from SRGWA President, Heather Jefferies.**

*Photograph by Wayne Tyson*

In July 1996, SRG held its annual club dinner. But unlike other club functions, this one was special. Unbeknown to the man of the evening, the dinner was planned as a surprise tribute to a long-term member of the club, and someone who has spent many years working solidly in the best interests of caves. The history of SRG is integrally involved with Norm, and so the evening was a good opportunity to recall a little of the history of the club, before moving on to the real issue at hand. I'll reproduce a little of the dinner speech, for members of the ASF who know Norm, and

share our clubs best wishes and thanks to him.

SRG has evolved over the years, growing rapidly over the last few years in particular. I'm very proud to have been a part of some of those changes, but I can't forget my introduction to the club. When I was taken to my first meeting, I was rather surprised at how few people were at the meeting. In fact, I think there were only four of us -Norm, myself, Kim (*Beardsell*) and Paul (*Drew*) as I remember! At this time, SRG was a very small club, much smaller than it is today. But if we go back right to the start, SRG

was formed as a breakaway club from WASG (*the "other" main caving group in West Australia*), in the early 1970's. As occurs in any club, conflicts had arisen, between the two Peters - Peter Bridge and Peter Henley. Peter Henley went on to leave WASG and was instrumental in forming SRG. In fact, he happens to be one of SRG's life members, but he departed for the UK many years ago, never to be heard of again.

It was about this time that Norm Poulter came on the scene, fresh-faced and full of enthusiasm, from Sydney.

*"Sure, it's going to kill a lot of people, but they may be dying of something else anyway."*

*-- Othal Brand, member of a Texas pesticide review board, on chlordane.*



For many years Norm has held the unlucky role of "SRG convenor", which is what we called the club president, after the club constitution was suspended. The sole reason that SRG is here today is thanks to Norm's efforts over the years. Notably, over the years, Norm himself has put in huge amounts of work into the club, and to caving itself, when not many others were willing to make such a commitment.

Over the years Norm has been involved in many projects including: huge amounts of conservation work in the South West, most notably, his work in the Christmas Star extension of Crystal, a testament to how well cavers can manage caves, and also in Calgardup, Mill Cave, and many others. He has also been active in conservation work on the Nullarbor, notably being instrumental in helping to clean up the lake at Weebubbe, as well as many other projects. Norm is responsible for much of the work on the infamous Giants Dig in the South-West of the state. This is now one of the few ongoing cave digs, with a history which runs back decades! New club members remember "The Dig" with fondness; it's sort of our clubs idea of "paying your dues" for the newcomers - I'll never forget my first CO<sub>2</sub> headache there! Over the years, Norm has represented SRG on many committees, including CMAC (*Cave Management Advisory Committee*), which oversees the caves of the Leewin-Naturaliste Ridge. There, Norm was (*and still is*) involved in much of the early work in both setting up the committee, and also the management protocols for down South, and he has weathered many

a heated meeting on behalf of the club. For many years, until only recently, Norm has been the editor of the club journal, "The Chronicle". Norm's expertise in cave photography is known Australia-wide, and over the years he has won numerous awards and prizes for his photographs. I don't think there is a caver in Australia who hasn't seen one of Norms "water-drop photos" - just check out the cover of the old Karst Index! For many years, Norm has been an



**Norm Poulter, always a fashion statement, on his way in to clean up Weebubbe Lake, Early '80's**

avid Speleo-bug-collector, and to his credit, he has had several new species of crawlies named after him. In the last few years, Norm has developed a standardised method of track-marking which is currently being accepted Australia wide. In the early days of his caving with SRG, he was involved in work establishing the "quaint stone hut" at Margaret River that our club members all call home. And for many years, Norm has been

the club representative to the ASF. It is also important to remember that even prior to Norm arriving in WA, he was an extremely experienced caver, having done much of the early exploration of Khazad Dum in Tasmania, by ladder, and he's also done extensive work in NSW and other caving regions.

WASG (*the "other" club*), in a tribute to Norm, mentions that he was the principle organiser of Cave Awareness Tours in the South-West, to provide education to the general public about the sensitive nature of caves. WASG also go on to make note of his "Cave Rights for Troglobites" paper delivered to an ASF conference, in which he drew cavers attention to the plight of many rare and endangered cave animals. Norm also initiated the voluntary ban on visitation to "The Dome" at Mullamullang for just these reasons.

In fact, Norm has even been recognised by the National caving body - the ASF, for all of his efforts, but sadly, he has never ever been recognised by his own club, which is what SRG sought to rectify at our dinner.

Norm was duly presented with a Certificate of Appreciation, which states "in grateful acknowledgment of cave conservation work done over many years within the Leewin-Naturaliste National Park" on behalf of the committee of CMAC and CALM at Margaret River.

Furthermore, Norm was presented with a written tribute from WASG. They pointed out the enormous debt that SRG and many West



Australian caves owe to Norm, and passed on their "salute".

Lastly, on behalf of SRG, Norm was presented with a Certificate of Appreciation, "in recognition of

your wealth of speleological knowledge and experience, as well as for your past and future guidance and contributions to the caving fraternity in general, and to the SRG in particular". SRG

congratulates and thanks Norm Poulter ... for really making a difference.

Heather Jefferies  
Chairperson, SRGWA Inc.

# New Extension in Drum Cave, Bungonia

by Sherry Mayo

In late 1995, just before the close of the cave for the bat breeding season, cavers from NUCC spent a few trips poking around in Drum cave looking for new passage. Looking in such a well trodden cave in such a well trodden area as Bungonia might sound like a poor way to find new stuff, but sometimes even well known caves can have a few surprises in store, and this was one of them.

During a "tourist" trip down Drum, the assembled masses spent quite a while peering at holes in the roof which seemed to indicate a roof tube running from above the second pitch and along the railway tunnel ending in a large dark hole above the third pitch. Another hole was also spotted near the sump. Envisaging the measureless caverns that these holes would surely lead to, we vowed to return!

Six scaling poles were ferreted out from the bowels of the NUCC hut for our next visit to Drum. They were duly carried down the cave and initially a short length was assembled to insert Andrew into the hole near the sump, which sadly didn't go. Next we poked John Hellstrom up into what seemed to be the start of the roof tube above

the second pitch. Clad only in shorts and wellies, he waded around in deep guano ooze but made little progress. Meanwhile, all six poles lengths were assembled into a long wobbly maypole with ladder attached, which was maneuvered

Not to be defeated, we returned some days later armed for bolt climbing. Starting some way back from the hole where the angle of the wall was only slightly overhanging, Mark bolt climbed about half way up to the hole by the time we called

it a day. Time was pressing as there were only a couple of weeks left before the cave was due to close for the bats to have their babies, so our next visit was a mid-week evening trip. I belayed Mark and then Lyle on the climb, whilst John (*more suitably attired this time*) revisited his guano swamp tube and managed to reach a window overlooking the Railway tunnel where he had a fine

view of the proceedings. Lyle finally got into the hole at some heinous wee hour of the morning when all good cavers should be in their beds. He disappeared into what we could now see was a tunnel for a surprisingly long time (*i.e. longer than 10 seconds!*). He was remarkably restrained and had just gone part way along the passage when he came back to tell us it went. As we were all exhausted we decided to head for home and explore it properly at the weekend. We got back to



*View back into the big chamber from the passage leading to the terminal grovel with Sherry Mayo in the distance*

toward the lip of the big black hole we'd been eyeing up above the third pitch. Unfortunately the pole only just reached the lip, and the ladies and gentlemen of science present could see that applying weight to the attached ladder would be dangerous and foolhardy. Little did we know that we were re-enacting a trip of 20 years previously, when Neil Anderson and friends of CSS (*possibly using the very same poles*) sagely came to the same decision!

*"Sure, it's going to kill a lot of people, but they may be dying of something else anyway."*

*-- Othal Brand, member of a Texas pesticide review board, on chlordane.*



Canberra exhausted but elated at 4 am.

At the weekend a keen team hurried down the cave and scooted up the rope left hanging down the climb on the previous trip to see what we had found. A classic phreatic tunnel of stooping height, floored with guano, led round a few bends before opening out into much larger sloping phreatic passage with big scallops on the roof. The uphill

chamber) reappears - having presumably followed a route under the flowstone. There are some interesting mud and gravel deposits on the sides of the stream and the passage can be followed downstream for a short distance until the roof gets too low to go any further.

The cave was photographed and surveyed, (*see survey over page*) and on a later trip (the last before the cave was closed for the season),

rope linking the bolt at the top to two others chemsets so you can get up the steep rubbly slope at the top of the pitch and into the passage proper.

\*\*\* **THE RIGGING IS  
AWKWARD - THIS ISN'T FOR  
SRT NOVICES** \*\*\*

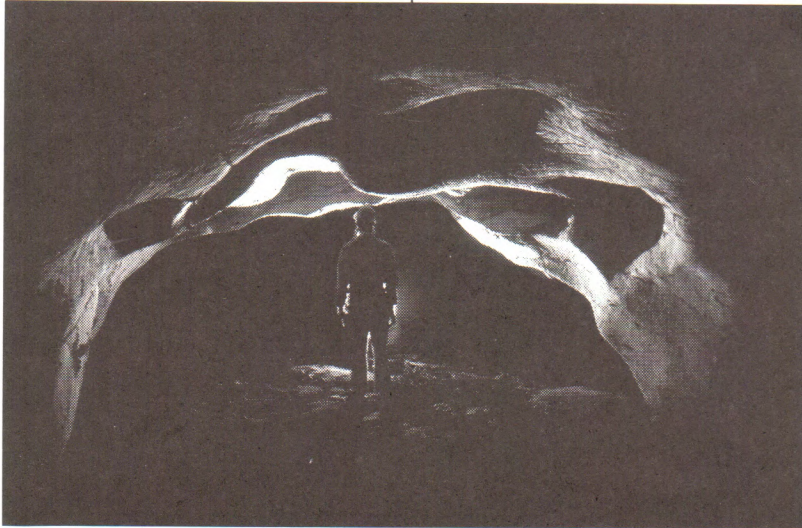
**RIGGING HINTS:**

See Al Warild's book "Vertical" if you don't know what a cordelette is, and then the following will make more sense.

Get the nylon loop sorted out to start with to make sure it isn't tangled and is running freely. Attach your rope to the tail of cord coming off the loop with a prusik knot or similar, and use some insulating tape wrapped around it to form a smooth cone along the transition between your thick rope and the nylon cord. This will help it pull through more easily. Flexible rope works best, but it has been done successfully with stiff rope (*it may need a bit of a tug*). Once your rope is in place, use a rock to hold the nylon cord taut out to one side, so it won't tangle with the rope or the prussiking caver.

You will need a rope protector to protect your rope where it hangs over the obvious lip. You also need to changeover onto the other (*permanent*) rope to get up the rubble slope and into the passage which is quite awkward. It is similar to a wide rebelay or pendule changeover, but you may find it preferable to transfer your foot -ascender rather than chest-ascender first depending on your rig. It is also advisable to NOT go to the very top of your rope, but instead to change onto the other rope as soon as you can - cowstails are needed.

The rubble slope section at the top of the pitch is very loose, and cavers climbing up it will almost



**"Andy Wall standing in phreatic passage  
leading to the big chamber"**

direction was closed off by flowstone, but downhill led to some fine mud covered gours followed by a flowstone cascade and a large chamber. Holes on the floor of the large chamber led to a small sumpy chamber plastered with dead bats.

It seems likely (*from our survey*) that this sump connects with the terminal sump on the known part of Drum. There is also flowing water entering the sump that appears to come from a side passage off the main chamber. This has more water than is seen in Drum and bits of caver-type debris in the stream suggest that it comes from a well traveled cave, most likely Grill.

From the big chamber, the main passage continues along a fault over a dry gour and flowstone covered floor. It finally drops down into a gravel streambed where the flowing water (*last seen in the sumpy*

more photos were taken, and a route marked to help keep at least some of the floor undisturbed. A chemset bolt was installed with a nylon loop to enable others to pull up a rope and visit the extension

A return trip was made after the cave reopened to check out a couple of leads in the extension: a climb up from the big chamber, and the terminal grovel, neither of which went. We know of at least a few visits from other cavers, and the route marking seems to be holding up well.

**Rigging Hints**

We have placed a chemset bolt at the top of the climb and have left a loop of 4mm cord in place running through it so people can pull up their own rope cordelette-style to get into the new section. There is also a permanent piece of 11mm

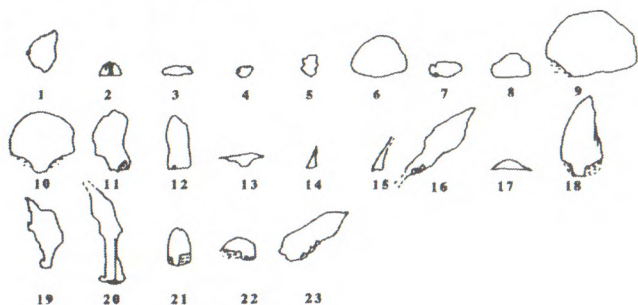


# Drum Cave Extension

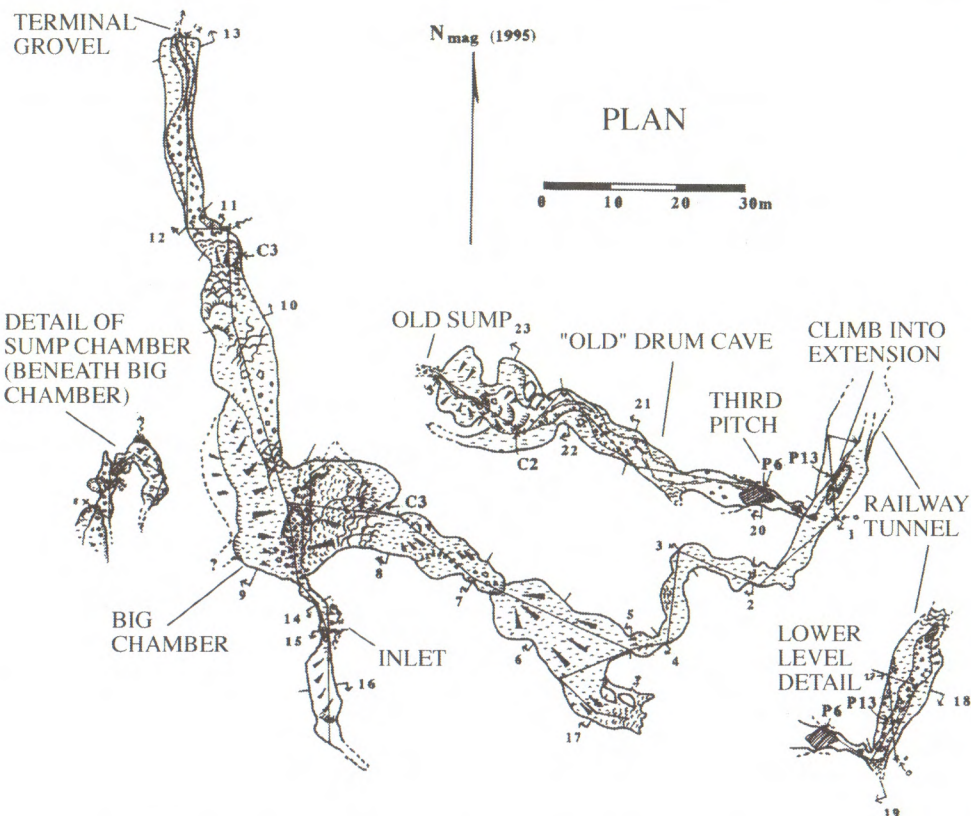
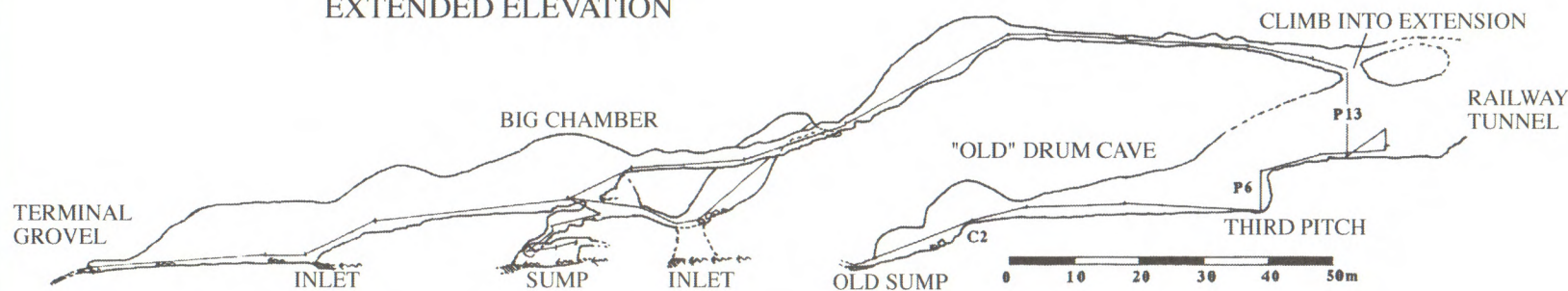
Explored and Surveyed to  
BCRA Grade 5b by NUCC

Drawn by Sherry Mayo

## CROSS SECTIONS



## EXTENDED ELEVATION



"Sure, it's going to kill a lot of people, but they may be dying of something else anyway."  
-- Othal Brand, member of a Texas pesticide review board, on chlordane.



certainly dislodge some guano and rubble, so don't stand underneath the pitch while others are climbing.

### Route Marking

We've marked a route through the new section to minimise disturbance to the mud and gours, please stick to it where possible.

### Survey Notes

The survey includes all of the extension as well as a re-survey of part of "old" Drum from the lower part of the Railway tunnel to just before the sump (high water prevented us from surveying through the sumpy passage). The survey starts in the Railway tunnel, P13 is the climb up into the extension and P6 is the third pitch

in the "old" part of the cave. The survey is BCRA grade 5b.

Bungonia fans may be interested to know that the new Bungonia Guide "Bungonia Underground" will have a complete new survey of Drum, including both the extension and the link with Mendip Cave.

## Some useful (but undocumented) features of GPS devices

### By Peter Ackroyd

Now that global positioning system (GPS) devices are readily available at an affordable price, there will no doubt be more and more cavers buying them for their day to day caving activities, especially in remote locations. In early 1994 my then rather pricey Garmin 75 GPS was an invaluable aid in navigation, logging of new karst features and relocating known features in the vast expanse of the Nullarbor Plain. The current model Garmin 38 comes in a much less expensive, neat, rugged package no bigger than a moderately sized mobile phone. The performance provided by these devices, and their predecessors, can be enhanced by some not readily identifiable "tricks of the trade". Of course, I'm assuming you have already optimised your GPS to output data on the correct geoid and in the best format. Not to carry out this essential first step could give you readings which err by over 200 metres.

### Positional averaging

Due to the deliberate degradation (by the US Department of Defence) of the GPS satellite signals available to civilians (a process they quaintly call "selective availability") position averaging is one of the most potent weapons in the GPS user's armory. Selective availability can add an error of up to 100 metres to a positional "fix" carried out by an inexperienced GPS user. Regrettably, the low cost GPS devices usually favored by cavers do not support automatic position averaging. However, there is a work-around.

The means by which I achieve a semi-automatic averaging of any one fix is to utilise the Garmin (and other brands) "track" function. Simply put, this function traces out the apparent path taken by the GPS device as you move about the earth's surface. By turning this function on when you are stationary, the device traces out the apparent movement induced by the

selective availability "error". Therefore, if you remain in one position for an hour or more (*while you are having lunch, say*) you get a kind of blobby trace around the true position of your GPS device. The centre of this "blob" is your average position.

### Dilution of precision

Dilution of precision (DOP), or a related function, estimated position error (EPE), are often standard features of common GPS devices. Garmin devices have both these functions. Either of these measures can be used by the experienced user to assess the ultimate precision of a single (*i.e. un-averaged*) fix. The lower the DOP (*or EPE*) the better. The actual figures depend on how well the satellite signals are being received by your device and the geometry of the satellites in the sky at any one time, but a DOP of less than 1.0 is very good (*equivalent to an EPE of 15*

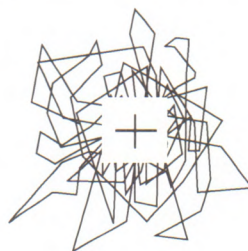


Figure 1  
Typical track plot when  
GPS is at a fixed location.  
The centre of the plot is the  
average position.

metres). To this figure must be added the effect of selective availability to allow you to calculate the very best precision that can be squeezed out of a single fix. So far, these are documented features but the concept of DOP is a little more versatile when applied to low cost units.

Such devices have a single, or at most two or three, satellite signal receivers in them. Thus they work by fast switching between satellites. It is only after the device has switched between, and assessed the data from, all available satellites that you will get your best fix. How does one know when this has happened? If you watch the DOP reading from the first moment the



device provides a position, or "fix", you will note that the DOP suddenly jumps up a whole digit or two before settling back to a (*usually*) slightly better figure. You have just observed one "switch" whereby the device has updated its position data by checking another satellite. Once there are no more such jumps in DOP it is a safe bet that you have the best fix currently available. Now is the time to log your figures. This process can take anywhere between 2 to 20 minutes depending on how clear a "picture" you have of the sky, how recent the last fix was and how far you have moved in the meantime.

#### Using the "altitude" reading to your advantage

Garmin units, and many others, have an option that allows the user to view the calculated altitude. This figure is not very accurate — the satellites are quite high and consequently vertical position geometry is poor. Altitude estimates, therefore, are up to three times less accurate than plan position estimates.

However, most of the time, you will have a fairly good idea of your altitude anyway and this information can be used to your advantage. If, while you are checking

the DOP, you switch the view to altitude every so often, you can be sure you are getting a better fix if the estimated altitude is within (*say*) 75 metres of the true altitude than otherwise. Once the DOP has settled down, the altitude can be checked and the position logged only when it is within an acceptable range of the true figure.

#### Conclusion

As a minimum I would recommend that you always take at least three readings, separated by three-minute intervals, for any position fix, unless the feature being logged is of fleeting interest only. In this way you will have three reasonably accurate figures from which you can obtain an average position and so reduce, to some extent, the selective availability effect.

However, for best results, you should apply the techniques of semi-automatic position averaging, DOP interpretation and altitude checks so that you will always be able to get better than usual performance from your low cost GPS for the recording of new cave or karst feature positions.

## WEEBUBBIE CAVE (6N2)- WHEN WAS THIS DISCOVERED BY EUROPEANS?

Max G Meth.

This cave is located on the Nullarbor Plain, near Eucla. Some history of the cave is given in an article<sup>1</sup> by Norman Poulter 'The clean up of Weebubbie Cave'.

The monthly newspaper *EUCLA RECORDER* mentioned the 'discovery' of this cave in 3 consecutive issues, 23 June, 21 July and 18 August 1900. The 18 Aug 1900 was, coincidentally, the last issue produced before the paper became defunct.

First account: 23 June 1900 issue page 2, is untitled and anonymous, and is in effect, an editorial. It does not state in simple terms that a cave with a lake was found, but does so almost as an aside, in a rather rambling fashion. The article commences thus: "As evidence of the fact of the extremely casual way in which the surrounding districts have been prospected

for water, above the cliffs, the find made by several<sup>2</sup> gentlemen of Eucla, whilst on a hunting trip stands out very prominently. The landslip at which is situated the entrance to the cave<sup>3</sup>, which contains a tremendous supply of water<sup>4</sup>, lies about 7 miles north west of Eucla.<sup>5</sup> Though the ground around it was taken up more than 20 years<sup>6</sup> ago, and stocked largely with sheep, no evidence was ever found as to the water<sup>7</sup> concealed beneath the ground".

<sup>2</sup>We are later told that there were only 2 men involved

<sup>3</sup>This is the very first mention in the 'Eucla Recorder' of the landslip or a cave at Weebubbie. It is here unnamed, but it is Weebubbie.

<sup>4</sup>And this is the first mention of the lake.

<sup>5</sup>This is a fairly accurate location. They were definitely not trying to conceal the location.

<sup>6</sup>'Taken up' implies that a pastoral lease was granted, and 20 years ago means 1880.

<sup>7</sup>The article here refers to the lake, and did not say, "No evidence was ever found as to the existence of the landslip". It seems the landslip was already known.

<sup>1</sup>Helictite 25(2) 1987 pages 43,44, and also Australian Caver 114 1987 pages 6,7.

"Sure, it's going to kill a lot of people, but they may be dying of something else anyway."

-- Othal Brand, member of a Texas pesticide review board, on chlordane.



The article goes on to say: "a great quantity . . . of fertile country lying far north and west of Eucla . . . was taken up by English speculators, when news<sup>8</sup> of the splendid qualities of this country for stock raising was first given out to the capitalist world. (These) remained unprofitable investments, through lack of water".

The date of the article gives a clue to the date of finding the cave, and lake. It must be prior to 23 June 1900, and may be in the period since the previous issue of the newspaper, ie 26.May.1900 to 23.Jun.1900. This is based on the fact that the cave is not mentioned in the previous edition.

However, it may be a good deal prior to June 1900. The finders of the water Clayer and Juncken, who were telegraph employees, realised the value of the water to the sheep industry. They took out a lease on the surrounding land. But there would already have been a leaseholder, because leases in this area were taken out in about 1880. Possibly, the lease on the land containing the cave had expired. In either case, they would have had to write to Perth to take over the lease? (*Perhaps this could have been done in Eucla?*) And this may well have taken months.

It would likely have been AFTER they took over the lease, that information about the water was released to the public, though this is speculation on my part. It will be necessary to check the records of lease holders to gain more insight into this.

The *EUCLA RECORDER* continues: "The country in the vicinity of Eucla has been eagerly sought after, and within a radius of about 15 miles, there are only, at present, about 1 or 2 small blocks not taken up".

Clearly, impetus to take up blocks around Eucla had already occurred by 23 June 1900.

The other 2 issues of the *EUCLA RECORDER* contain Part 1 and 2 of an article titled, "SUBTERRANEAN LAKES", also anonymous. This actually states that the 'landslip' was already known:

21 July 1900 page 4: "As 2 officers of the SA department (telegraph) Mr A L Clayer and Mr F Juncken were out for a day's shooting recently, it was a great surprise for them to come . . . to the verge of a tremendous landslip 7 miles north west of Eucla. The presence of which has never even been suspected by whites, though found on inspection to have been known to the natives".

This statement, makes it clear that natives knew of the landslip, but that whites were unaware of it. However, it was negated in the following issue, 18 Aug 1900,

<sup>8</sup>Referring to the overly optimistic report by John Forrest in 1870, eg 'beautifully well grassed' and 'as grazing country, far surpasses anything I have ever seen'.

page 8: "Correction - *Recorder* 21/7/00, in connection with the discovery, substitute "cave" for "landslip", as the presence of the slip was known to whites. *Not so that of the cave.* Ed."

This therefore confirms that the landslip of Weebubbie was known previous to June 1900, but that the cave and lake were not<sup>9</sup>. Sadly, the article has no more to say on the subject, and there were no further editions of the newspaper.

So it seems that the doline had previously been known, but that it had not been explored, and so the existence of the cave (*and lake*) was unknown. The cave is very difficult to access, because the doline is vertical to overhanging on all sides with heights of up to 30m, except for one point, where there is now a fixed ladder. But even there the sides are very steep, and the appearance is, that it is not free climbable.

And there was the precedence of the two similar large dolines, Chowilla and Abrakurrie, which were known not to contain water. These were further from Eucla than Weebubbie, but lay close to the coach route, and thus had been found earlier. So why even bother to explore Weebubbie? The pastoralist was no doubt busy raising sheep, and was not a rock climber. At least this is my explanation for the lack of interest prior to this time.

I believe Weebubbie would have been known of as soon as the area around it was fenced and stocked with sheep (1880 or earlier). Two of the old fences run close to the doline, though I do not know when these fences were built.

An account of Clayer and Juncken's discovery is given in the 21 July 1900 issue<sup>10</sup>: "finding a place sufficiently less steep than the rest of the almost perpendicular walls, . . . after an abrupt descent of about 100 feet...the bottom, opened into a huge cave (but) they were without any light. On the Sunday following ... this time (with) Mr F Simmonds ... the cave was reached and entered. If it had not been for a lucky splash of a stone which one of them threw ahead, they would, without doubt, have walked straight into 15 feet of water. Nothing but water was to be seen on all sides".

It seems that on this trip, none of the 3 was prepared to go for a swim on the lake. "It was determined the next effort be made by swimming and ... another trip was arranged for the following Sunday".

18 August 1900 issue: "the following Sunday Mr J A W Hillman volunteered to swim as far as possible. The

<sup>9</sup>And this makes it unlikely that there will be any mention of the cave in earlier writings, but the landslip may possibly be mentioned. The Landslip would not be named as 'Weebubbie' as this name was first used much later.

<sup>10</sup>No date is given for any of these 4 trips.



end of the big cave was reached by the swimmer, but it narrowed down and opened into a smaller cavern. There was a suspicion of an undercurrent, (so) he decided (to) return. Another visit to the cave, when a raft was lowered. Mr Hillman again ... exploring. The body (of water) is 250 yards long by 35 broad with a depth at the edge of 16 feet, 50 yards on, 31 feet".

The date of discovery of the landslip itself remains a mystery, but as stated above, I believe it to be 1880 or perhaps earlier. In fact it is possible it was known as early as 1872, the year the Moopina sheep station commenced. Two brothers, John and Andrew Muir established Moopina Station at Eucla on 5 March 1872.

**Further reading / bibliography:**

Dunkley J R & Wigley T M L, 1967, *Caves of the Nullarbor*, Speleo Research Council, Sydney.

*Eucla Recorder*, 1898-1900, various articles.

Forrest John, 1870, *Explorations in Australia*, Sampson & others, London, pp112-118.

Muir family, collection of letters and memorabilia, held in Eucla Museum, Eucla (and Battye Library Perth).

## APPEAL FOR HISTORICAL INFORMATION - NULLARBOR PLAIN.

Details relating to the following topics are sought.

- 1) Specific to the history of Weebubbie Cave.
- 2) Specific to a mail coach service that operated from about 1876 from Eucla. One coach ran east to SA, another (entirely separate) ran west into WA.
- 3) Relating to accounts of persons crossing the Nullarbor, particularly during the last century. I would also be interested in accounts right up to the present date. These accounts may have been published in newspapers or magazines, or may be in unpublished notes and memoirs etc.
- 4) Any other historic information pertaining to the Nullarbor.

**The writer would be delighted to discuss these matters with interested persons.**

**Persons who can help could contact the writer:**

**Max Meth, PO box 622, Ceduna SA 5690,  
Phone - 08 8625 2700.**

XX

## *Quorn ASF Conference Post Conference Nullarbor trip 4 April to 11 Apr 1997*

***Persons interested must provide their own transport.***

***Contact Max Meth for details on 08 8625 2700***

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# STUFF...

## 12th ACKMA Conference

The bi-annual conference of the Australian Cave and Karst Association is being held at Waitomo Caves, New Zealand this year at the end of April. ACKMA Conferences are held in a different area each time, the last in Tasmania two years ago. In 1985 the conference was at Waitomo Caves, with thirty-five participants.

A varied program has been arranged for the six days of the conference this year with field trips, cave visits and presentations of papers.

*"Sure, it's going to kill a lot of people, but they may be dying of something else anyway."*

*-- Othal Brand, member of a Texas pesticide review board, on chlordane.*



Brief details of the program follows:-

<b>Saturday</b>	<b>26th April</b>	Arrival Day
<b>Sunday</b>	<b>27th April</b>	Introduction to Waitomo. Official Welcome and opening. Adventure Caving and keynote Speaker-Professor Paul Williams.
<b>Monday</b>	<b>28th April</b>	Karst Areas field trips - all day
<b>Tuesday</b>	<b>29th April</b>	Tourist Caves and papers
<b>Wednesday</b>	<b>30th April</b>	Tourist Caves and papers
<b>Thursday</b>	<b>1st May</b>	Karst Study, forestry, ACKMA AGM
<b>Friday</b>	<b>2nd May</b>	Field trip, natural bridge, caves, Conference Dinner

#### *End of formal Conference*

<b>Saturday</b>	<b>3rd May</b>	Day trip to Rotorua Thermal area
<b>Sunday</b>	<b>4th May - 8th May</b>	Post conference study tour to Nelson Karst and Cave areas. (In the South Island)

Approximately eighty participants are expected, with a good number from Australia. The cost of the conference is \$NZ550.00, which covers all transport, meals, publications and air port transfers.

Accommodation is a separate cost ranging from budget @ \$NZ19.00 per night to premium @ \$NZ90.00 per night.

There will be opportunities for wild caving trips and commercial adventure caving trips, such as Black Water Rafting. While the conference is getting close there should be room for late registrations, although accommodation may be tight.

For Further information, contact.

**Peter Dimond**

**Conference Organizer**

**PO Box 30**

**Waitomo Caves**

**Telephone.** 64.7.8787640

**Fax** 64.7.8786184

**Email** waitomomuseum@xtra.co.nz

## Contributions to Wild Magazine

Stephen Bunton

I have been the caving correspondent for Wild Magazine for more than 10 years now. During that time I have tried to keep the general outdoors enthusiast briefed about the nature and extent of Australian caving endeavors. This mainly involves details of explorations and overseas expeditions, longest and deepest caves, conservation battles and other stuff that is of interest to non-cavers without giving away sensitive information. However, I am not always able to keep up to date and include everything worthwhile. I actually prefer and encourage cavers to give their own submissions to Wild. This alleviates any problems of inaccuracy and also gives credit where credit is due.

I see the role of Wild as to document significant achievements of Australian Speleos for the general outdoors public and I have been somewhat proud of my efforts in the past. To continue this historical record I'd like your help. If you think that your

endeavors fit that category then please write directly to;

**Chris Baxter Managing Editor**  
**Wild Publications**  
**PO Box 415**  
**Prahran VIC 3181**

or

E-mail to  
**Dave Burnett**  
**Editor Wild**  
[davenic@netwide.com.au](mailto:davenic@netwide.com.au)

or

if you would like me to compose something

**Stephen Bunton**  
**P.O. Box 198**  
**North Hobart, Tas. 7002**

*"Living on Earth may be expensive, but it includes an annual free trip around the Sun.*

*-- Anonymous*



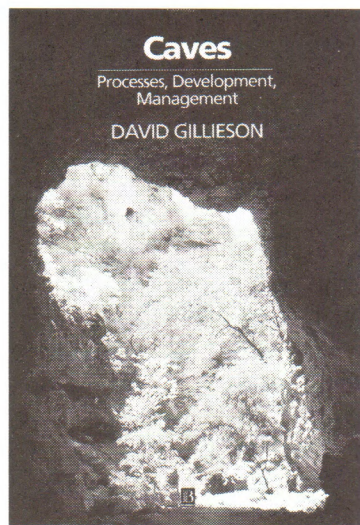
# BOOK REVIEWS

## Caves: Processes, Development and Management,

David Gillieson,

1996. Oxford: Blackwell Publishers Ltd; ISBN 0-631-19175-5; paperback, 324 pages, rrp \$45.

By Peter Ackroyd



In a book that should be mandatory reading for all managers of karst areas, Dave Gillieson has provided us with an opportunity to enhance the knowledge that experienced cavers already have and to set budding cavers on the right track for a fuller understanding of caves and karst. I do have a few criticisms (*yes, I'll come to those*) but overall this is a must-buy book.

In an introductory chapter, that promises a little more for the book than we ultimately get, Gillieson makes plain his forté with a passage on page 5: "... once deposited, it is very difficult to erode cave sediments. Thus, caves can be regarded as natural museums in which evidence of past climate, past geomorphic processes, past vegetation, past animals and past people will be found by those who are persistent and know how to read the pages of earth history displayed for them."

On page 7 of the same chapter Gillieson sets out his other strength with the simple but telling sentence: "Thus we cannot consider caves and karst as geomorphic systems in isolation from biological processes." If all cave and karst managers fully understood this simple concept — one that experienced cavers have been trying to get across for years — then karst landscapes in Australia would be in a far healthier state than they are at the moment. It is in these two under-researched areas that this book shines like a caplamp through the stygian darkness.

Gillieson's book is well structured and is clearly laid out with many useful illustrations. One drawing in particular — his "carbon dioxide cascade" — stands out (see Fig 3.7 on page 72). This image gives such a clear idea of the close interaction between the biosphere and karst that it should be enlarged and stuck on the wall in front of each cave manager's desk. It clearly shows how caves and karst areas depend for their "health" on the retention (or replacement) of the original plant cover above them. It also goes a long way towards explaining why experienced cavers involve themselves in such apparent "non-caving" activities as revegetation projects. In the book Gillieson takes us through cave hydrology in a chapter which is marred by a style not in keeping with the majority of the book. The chapter draws on the excellent work of Steve Worthington but does not fully expound his exciting theories on

karst hydrology as they relate to cave development. The chapter also contains several typographical errors in a not particularly well explained series of mathematical equations, which would make for very confusing and heavy going for most readers.

In marked contrast, this chapter is followed by a good chapter on cave development, explaining the progress of a cave's growth from its beginnings as tiny fissures and tubes to well decorated passages. Speleothems and cave minerals (*which in this book are jointly referred to by the ambiguous term "formations"*) are covered perfunctorily in the next chapter (*with, mercifully, only one speleothem photo printed other than the right way up*) before the book gets really interesting.

In rapid succession we learn about cave sediments and the techniques used for their dating before being led into a discussion on the use of this information to deduce past climates. This "natural museum" theme is continued with a look at cave ecology, including a plea for cave habitat conservation. We then reach the last two chapters which, to my knowledge, cover topics never before dealt with in the caving literature.

These two chapters discuss cave management and, just as important, catchment management in karst areas. The author has drawn on his own experiences and uses case studies effectively in both these excellent chapters.

*"Sure, it's going to kill a lot of people, but they may be dying of something else anyway."*

*-- Othal Brand, member of a Texas pesticide review board, on chlordane.*



Despite the author's slightly uneven style - from the rather terse chapter on hydrology - through the open and informative style of the chapters on sediments and dating, to the more didactic style of the chapters on management — and the minor irritations experienced when one discovers errors in equations and the use of ambiguous terms like "formation", this is without doubt, one of the great books on karst. The

author, based in Australia, is fulsome in his payment of his debt to other workers in his field — a practice not universally followed by every karst researcher in Australia. He has a detailed list of references at the end of each chapter making the book more useful as a research tool. There is, in addition, a good glossary of terms used in the book.

Caving clubs usually have a library, into which this book should instantly go. Serious cavers who value caves as being something more than underground gymnasiums may consider a few books for their own shelves. If you can afford only two books I'd recommend this book and Joe Jennings' *Karst Geomorphology*. If you can afford only one of these, Gillieson's is the one to buy.

## **SPELEO SYNOPSIS No 22**

**October 1995 - April 1996**

*by Peter Ackroyd*

## **AUSTRALIA**

### **SUSS Bull 35 (3) (Jan-Mar 1996)**

In this issue Keir Vaughan-Taylor gives a rundown on the Wellington Caves Diving Project. A map of the underwater cave, McCavity, is included. The cave contains underwater speleothems, several species of Syncarid (a kind of water beetle) and the remains of an Eastern Quoll - now believed to be extinct except in Tasmania.

### **MSS Journal 35 (1995)**

This is a special 30th anniversary edition recording the history of the Metropolitan Speleological Society (Sydney) from its inception in 1965 to the present.

## **NEW ZEALAND**

### **NZ Speleo Bulletin 171 (Sep 1994)**

This issue contains several articles on cave diving dating from 1982 through to 1992. Elsewhere, the history and Maori significance of Fields Cave on the West Coast and the discovery of Greystoke at Mahoenui is described.

### **NZ Speleo Bulletin 172 (Dec 1994)**

Noel Johnson gives his reminiscences as the 10th member to join the New Zealand Speleological Society in 1952. Many early discoveries and amusing pranks are recalled. Mark Bodt provides a report on the 1992 International Cave Rescue Conference held in Wales,

UK. Later in the issue Kieran McKay records his discovery of Daylate Cave at Te Reinga and then joins with Cathy Worthy to describe the Ellis Basin trips of 1992 and 1993. Finally Danielle Geminis gives us her thoughts on good patient management in a cave rescue.

### **NZ Speleo Bulletin 173 (Mar 1995)**

This issue contains stories of extensions in the Te Reinga Cave system (Whakapunake), a proposed classification of caves in the Ruakuri and Waitomo Caves scenic reserves and diving in Gorge Creek Cave.

## **EUROPE**

### **International Caver 14 (1995)**

This issue opens with two articles describing the large river caves of Slovenia and the caves of Hungary. This is followed by a description, with map, of the Cater Magera, a 7.3 kilometre long gypsum cave in Syria and

a fascinating article summarising the contributions to speleology made by E A Martel (1859-1938).

### **Caves & Caving 69 (Autumn 1995)**

This issue contains updates on the various digs and discoveries in the UK. There is an article by a French



team describing their impressions of caving in the UK and a 1988 report on a cave dive in an unnamed country (probably Norway). Bill Gascoine gives us a summary of his discoveries in and around the 26 kilometre long Ogof Draenen (South Wales) using dye tracing methods. Other items include a description of the five "Special Interest Groups" in the UK (cave radio, explosives, hydrology, speleo-history and surveying) and a summary of caving in New Zealand.

#### **Stalactite 1/94, 2/94 & 1/95**

This national caving journal of Switzerland is well produced and has excellent photos. Issue 1/94 has exploration reports on A2-Loubenegg (in the Sieben Hengste Region, Central Switzerland) requiring underground camping in 5-degree temperatures. It also describes a new blasting technique using easily acquired Hilti (or Ramset) cartridges, as used by builders. Issue 2/94 has an article on a paleontological dig in a small animal trap cave in NW Switzerland and a detailed description of the exploration of B.,renschacht (Sieben Hengste Region). This required caving more than 36 kilometres beyond a sump and so it was characterised by many long camping trips, spread over an eight year period. The discovery and exploration of the 1,060 metre deep Muttseeh"hle in Central East Switzerland is described and illustrated by several good photos. In issue 1/95, we are shown methods for minimising survey errors, a linguistic analysis of the word "mondmilch" (moonmilk), sediment analysis of a cave in NE Switzerland, the cave bear sites in NE Switzerland (on the Austrian border), expedition reports from "Cuba '95" and "Cerro Rabon '93" (Mexico), how to reduce accidents and an introduction to the creation of works of art in caves.

#### **Grottan 4-94 (Dec 1994)**

*[In Swedish - English summaries]*

This issue describes a mineral, 'vaterit', found growing as small tubes from piles of spent carbide left in caves! There is also an article on a method of constructing 3-dimensional models of caves.

#### **Grottan 1-95 (Mar 1994)**

This issue contains information on caves in Tenerife and has statistics on caves in Sweden.

#### **Grottan 4-95 (Dec 1995)**

There are not many limestone caves in Sweden therefore it is not surprising to find this issue given over to a story about an ongoing dig into a vertical cave completely filled with mud. It is called Upphetsningen ("Excitement Cave") and is now 18 metres deep after excavating 20 tonnes of mud!

#### **Grottan 1-96 (Mar 1996)**

The results of an interesting survey are in this issue. The survey was conducted via the Internet seeking cavers' opinions on a definition of the true length of a cave.

#### **Cave and Karst Science 22(1) (Aug 1995)**

This issue has articles on the caves of South Nordland, Norway, an analysis of sediments in Scottish caves, pal'oenvIRONMENTAL and pseudokarst studies at Western Cape, South Africa and late pal'ozoic karstification in SE Australia.

#### **La Nosta Speleologia (1994)**

This issue of "Our Caves" (Italian) covers some artificial cavities (underground forts) in Italy.

#### **Descent 126 (Oct/Nov 1995)**

Sid Perou, well known underground film maker, tells how he came to make the film "Rescue at Sunset Pot" where he recorded an actual cave rescue attempt. This issue also describes a new extension in Scotland's biggest cave Uamph an Claonaite.

#### **Descent 127 (Dec 1995/Jan 1996)**

A famous English caver, George Cornes, has died. He was 85 years old. George discovered Great Britain's longest cave, Lancaster Hole (Ease Gill System), in 1946 and was a major driving force in the years of exploration that followed. Jim Eyre pays tribute to him in this issue.

#### **Descent 128 (Feb/Mar 1996)**

The news section of this issue mentions that Ogof Draenen, the current 'hot' discovery in South Wales, is now 38 kilometres long and is still growing. Elsewhere, a small (5.5 kg) petrol driven drill is reviewed for caving, some of Linda Heslop's cave drawings are displayed as a centrefold, Gavin Newman writes about being paid to go caving in Faustlock (*Switzerland*) as an expedition photographer, Sid Perou describes what it is like to be on a cave rescue during which the patient dies and Pete Francis becomes lyrical in his short description of caving in Hei Long Dong (*Sichuan Province, China*).

#### **Caves & Caving 70 (Winter 1995)**

The main stories in this issue are about caves in Mexico, where floods made discovering around 3 kilometres of passages in the Cuetzalen Region quite a challenge, and expeditions to the Matienzo Region of Spain.

#### **International Caver 15 (1995)**

In another great issue we learn of the caves of North-Eastern India. Then we hear the fascinating tale of a long term cave dig that everyone thought was not worth it until a young team dug their way into Ogof Draenen in South Wales. At more than 35 [now 38] kilometres to date this is the third longest cave in the UK and it is still growing! There is a report from an American team who visited North-Eastern Sarawak and finally a huge article entitled Caving in France Included is a list of deepest and longest French caves.

*"Sure, it's going to kill a lot of people, but they may be dying of something else anyway."*

*-- Othal Brand, member of a Texas pesticide review board, on chlordane.*



**Proceedings of University of Bristol Speleological Society 20(2) (1995)**

This issue contains items concerning the relationship between cave development and the adjacent Avon River at Bath (UK), drift deposits east of Bath (UK), and expedition to Slovenia in 1994, possibly the first recorded use of a telephone in a cave (Lamb Leer) in the early to mid 1880s and a summary of excavations carried out in the Wye Valley (UK).

**Ipoantropo 7 (1995)**

This is the Bulletin of the Emilia Region Speleo Group (in Italian). It contains a summary of discoveries and explorations carried out by the group during 1995.

**International Caver 16 (1996)**

News from around the world in this issue includes an update on the caves of Tanzania (Africa), prehistoric art found in Kopova Cave (Russia), cave fauna of Malaysia, the caves of the Forest of Dean region in the UK, a reconnaissance trip to Vietnam and

Laos and a 1995 expedition to Mexico. There is also a list of the longest and deepest caves in the world.

**Descent 129 (Apr/May 1996)**

In this issue we see the return of the reminiscences of Len Cook. This time Len talks about early free diving exploits in Britain's Boreham Cave around 1950. There is more detail on the latest finds, some well decorated, in Ogof Draenen (South Wales) including discussion of its geomorphology. Two articles on cave digging each use current dig projects to examine, in their own ways, the ethos of cave diggers. The new Petzl "Explorer" electric/carbide helmet mounted light is reviewed in this issue - generally an improvement on the old "Lazer" system but expensive to buy and requires factory fitting.

**Cave and Karst Science 22 (2) (Oct 1995)**

This entire issue is taken up with a report on the British expedition to China's Yangtze Gorge karst area in 1994. It contains some stunning colour photos of karst landscapes.

***Editors note:-** Apologies to Peter Ackroyd & readers, but the USA component of Speleo Synopsis No 22 will have to wait until next issue. A couple of late contributions have zapped all available space in this issue, and we don't want to go over the Australia Post weight limit and have to pay the extra \$400 for postage like last issue, do we?*

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## MAGAZINE REVIEW

### Underground Photographer Issue 3 & 4

BY DAVID GWILLIM

Underground Photographer is a quarterly publication from the United Kingdom covering photography, video, lighting and art underground. Subscriptions and further information can be obtained from Kym ap Rhys, Underground Photographer, 40 Buckingham Road, Petersfield, Hants, GU32 3AZ, United Kingdom (email: kym@dhios.demon.co.uk; web site: <http://www.dhios.demon.co.uk>).

Underground Photographer Issue 3 (September 1996): Yet another excellent magazine for all cave photographers. This issue includes a Q&A section for first time cave photographers and two articles on various types of tripods and tripod alternatives. The folio section features portrait photos while the photo gallery features composition. Technical articles include the use of

ultra bright LED's as a focusing aid, use of dichroic lamps for photographic lighting and a very DIY approach to video lighting using 50W bulbs in jam jars. There is also a major article on selection of a video camera for underground use covering the features to look out for and those to avoid. An unexpected benefit of subscribing to Underground Photographer is access to the classifieds which gives information and addresses for obtaining specialist photographic products especially infra-red slave units designed especially for caving.

**Underground Photographer Issue 4 (January 1997):**

This issue contains an interesting article by Mike Bedford encouraging underground photographers to go beyond the two

classic images of a caver in a passageway or caver admiring cave decoration, this is backed up by a folio of photos depicting surveying, underground radio and other non "standard" photos. There is an article on how to prepare photos for exhibition, Chris Howes the editor of Descent explains what is required if you want your work to feature on the cover of a magazine and issues surrounding choice of film are discussed. For those with a hi-tec bent there is a review of printers for digital photographic output and a review of commercial CD-ROM's featuring caves. Mines are featured in the photo gallery. I am also pleased to report that image quality has improved greatly on the first few issues.



# 1997 FLINDERS CONFERENCE QUORN South Australia. REGISTRATION FORM:

Australian Speleological Federation Inc.  
29 March - 3 April, 1997

(Non-conference attendees complete section below)

(1) FAMILY NAME: \_\_\_\_\_ PREFERRED FIRSTNAME \_\_\_\_\_ (M / F)

(2) FAMILY NAME: \_\_\_\_\_ PREFERRED FIRSTNAME \_\_\_\_\_ (M / F)

ADDRESS: .. \_\_\_\_\_ Phone No: (AH) \_\_\_\_\_

\_\_\_\_\_, State: . \_\_\_\_\_ PC: \_\_\_\_\_ Phone No: (BH) \_\_\_\_\_

Email: . \_\_\_\_\_ Phone No: (Fax) \_\_\_\_\_

Non-Conference Attendees:

List names of non-conference going partner and / or children

FAMILY NAME	GIVEN NAME	Male / Female	CHILDS AGE	CHILD CARE
-------------	------------	---------------	------------	------------

Y/N

Child Care cost will be  
advised dependant on  
numbers.

## DIETARY REQUIREMENTS:

Caving Dinner (Tuesday 1/4/97) please state:

\_\_\_\_\_

## WORKSHOPS

Please indicate your preference for attending workshop sessions: 1 = Highest

Survey Techniques _____	Search & Rescue _____	Electronics _____	Track Marking _____
Cave Photography _____	Cave Diving _____	Caving Equipment _____	Cave Restoration/ _____
	Techniques _____		Cleaning _____
Mapping Techniques _____	Other: _____	Other: _____	Other: _____

## FIELD DAY & POST CONFERENCE WEEKEND:

I will require TRANSPORT on the Conference Field Day YES / NO

I am interested in attending POST conference trips for the weekend of 4 - 6 April, 1997 YES / NO

*"Sure, it's going to kill a lot of people, but they may be dying of something else anyway."*

-- Othal Brand, member of a Texas pesticide review board, on chlordane.



