The WAY OUT

The Newsletter of the
West Brecon Cave Rescue Team

EDITION FOUR, MARCH 1998

Welcome, at long last, to Edition 4 of *The Way Out.* This one has taken so long to put together for the usual reason; the promised articles materialised in something of a slow trickle. There's no way round this and it's not intended as a criticism of contributors - everyone has more important priorities in their lives than writing for caving journals, after all - but the original intention was that this publication would appear at regular intervals and it hasn't happened quite like that. I'll do my best to get it back on course but from the team's point of view it makes poor economic sense to send out a newsletter with a small amount of material in it just to meet a previously-chosen publication date.

My thanks to everyone who has taken the trouble to write for this edition, and in particular to Gary Evans who does much of the co-ordination and chasing. The address for contributions remains: **26 Constable Way, College Green, Camberley, Surrey GU47 0FE.** My telephone number is 01276-609162 and there's an answering machine on there all the time. Alternatively you can send me a fax, clearly marked for my attention, c/o *Classic and Sports Car* magazine on 0181-943-5844. I look forward to hearing from you. **Tony Baker.**

South Wales Cave Rescue Organisation (SWCRO) AGM
by Gary Evans

The SWCRO executive consists of eight representatives, four from each rescue team. There are three officers and the current reps. (as elected at the SWCRO AGM on 22nd February and in position until the February '99 AGM) are :

WBCRT - Gary Evans (Chairman, SWCRO)
Brian Bowell (Treasurer, SWCRO)
Claire Hicks
Kevin Munn
GCRT - Vaisey Bramley (Secretary, SWCRO)
Chris Brady
Phil Jayne
Malcolm Reid

It is hoped that the SWCRO committee will be able to build on the good work done during 1997/1998 to further strengthen the two teams and the relationship between them, the police and other rescue organisations.

Team News
by Gary Evans

Fundraising initiatives continue to dominate the team's thinking with many members of both the Executive Committee and the team coming up with ideas and inputs. Jopo as ever continues to put in great efforts in this area with the sponsored walk being his latest project to raise money for the team. (See later item.) Pat Hall is continuing to work towards the completion of the main grant application and the "matched funding" grant applications that we get annually. Of course, many many thanks to all of you who have donated money or worked to secure donations and funding. It is greatly appreciated.

Sale of Equipment

There are still a number of items of equipment for sale from rescue, these items include: ammunition boxes - various sizes, site helmets, catering equipment, space blankets, nearly-new Suretred wellies, Rescon T-shirts, lighters, and other various assorted peculiarities. Contact Gary on 01639-730806 if you are interested.

1st Aid Training and Dates

1. Cave Rescue First Aid Course

This is the new advanced first aid training course that for us replaces the old "First Aid in Mountaineering" course that Bob Hall ran for many years. The new course is aimed specifically at caving and cave rescue and covers the relevant techniques and equipment. To undertake this course, you must either hold a current First Aid at Work certificate or equivalent or have held one recently.

If your First Aid qualification is due to expire, or you feel the need to have more relevant training, then this is an ideal opportunity for you. The next course is 8th to 10th May 1998, followed by one in early July. If you would like a place on any of these courses or on courses to be run later in 1998, please contact Bob Hall as soon as possible on 01422-343121. (See also later item in this newsletter.)

2. Basic First Aid Training

By popular demand, we intend to run a basic first aid training course in April for people that either want to progress to the Cave Rescue First Aid course, or would just like to have the basic training. It will be an approved, accredited and certificated course. If you would like to attend a basic first aid course during 1998, please contact Gary Evans on 01639 730806.

Training Dates

Upcoming rescue training events are as follows:

April 4th -	Black Mountain Caves and Digs - Route Cards. A chance to try out the new route cards for the Black Mountain.
June 20th/21st -	Mid-Wales Mines Practice - A weekend in Mid-Wales practising mines rescue techniques.
September -	To be decided
November 28th -	War Game and Rock Falls. Another war game with a parallel practice on rock falls, boulder chokes, jacking and use of explosives in rescue.

WBCRT AGM

The AGM of the West Brecon Cave Rescue Team is on June 28th at the Copper Beech in Abercraf at 10.00am. This is your chance to bring up any issues, ask questions and an opportunity to be involved with the selection of Executive Committee members for the 1998/1999 year. Please attend and support your rescue team.

Acknowledgements

This issue of *The Way Out* has been possible thanks to the following: ***Abertawe Desktop***, based in Llansamlet, Swansea, who provided the printing of this issue for free and ***Dragon Caving Gear*** in Abercraf, who paid for the paper and distribution of this edition, continuing their ongoing support for the West Brecon Cave Rescue Team.

The Edward Aslett Race/Walk

This is your chance to raise some much-needed money for WBCRT and enjoy a challenge. For many years SWCC have organised a run from Brecon to the club's HQ at Penwyllt, a distance of some 19 miles. This year it's a WBCRT fund-raiser, and is open to all-comers, not just SWCC members. It takes place on **Sunday 3rd May** and you can either take part in the race or just enjoy the walk, but either way the idea is that you'll secure sponsorship. There is a telescope awarded as a trophy for the first SWCC member to finish but non-members can compete for a separate trophy. The plan is that there will be a bit of a do at Penwyllt after the event, so please, please take the trouble to get involved. Entry/sponsor forms are available from Brian Jopling at 31 Holbeche Road, Sutton Coldfield, West Midlands B75 7LL (0121-378-1936), or from those kindly folk at Dragon Caving Gear in Abercrave.

A "Thank You" from WBCRT

by Kevin Davies, WBCRT Treasurer

In the last edition of *The Way Out*, we appealed for donations towards the WBCRT funds to help with the purchase of new equipment. On behalf of the team, I would like to take this opportunity to thank you for your donations so far, whether it be in events, personal donations, sales or donation boxes. I have included a brief summary of monies collected so far:

Sales -	£30.00
Events -	£330.00
Donations -	£390.00
Donation Boxes -	£110.00

Thank you for your support, and keep up the good work.

Call Out Database

by Ali Garman

The WBCRT Call Out Database (COD) is reaching maturity. It is now under the umbrella of The South Wales Cave Rescue Organisation (SWCRO) and holds data for both WBCRT and Gwent Cave Rescue Team (GCRT). There are over 150 names in the database, the majority of which are WBCRT. Another new feature is that it now stores attendance of cavers at rescue practices and training evenings. This information is used to prioritise cavers in reports and queries generated from the database. This will help Controllers, in the heat of the action, to call out the best available cavers for any particular task.

As many of you will know a pilot set of reports generated from COD has been available at Penwyllt for several months. With the feedback from this pilot and the new features, we are now ready to generate the first set of reports for distribution to wardens. However, these paper-based reports demonstrate only a fraction of the full capabilities of COD and are not the end of the development in any way. COD, which is written in Access 7.0, has an easy-to-use query interface which allows moderately trained users to enter search criteria for a particular job and instantly receive information on the nearest, best trained, suitable people available. In the fullness of time a portable laptop computer will be available. There are currently two copies of the database, in addition to the reports which will be circulated to wardens shortly. However, COD will only be as good as the data it holds. This means that whenever you change address, buy a mobile phone, change job, get a first aid certificate etc. you should let me know. Means of contact is preferably via e-mail (ali@rwa-net.co.uk) or alternatively by post to 147 Moorland Road, Splott, Cardiff, CF2 2LG.

REPORTS ON INCIDENTS/PRACTICES

Pant Mawr Rescue, January 1998

by Gary Evans

On Saturday 31st January 1998 there was a rescue incident involving a party who had been caving in Pant Mawr. This incident involved the West Brecon Cave Rescue Team, the Bridgend Mountain Rescue Team, the Police, an RAF helicopter, 25 WBCRT members, 15 MRC members and a 10-hour call-out time. This significant rescue effort could have been easily avoided.

The party of three, on exiting the cave found themselves running a little later than expected. Two of the three decided that they would run back to SWCC Headquarters and hence prevent a rescue call-out. The third member, who was feeling tired, said that he would rest awhile and then follow them. It was 5.30pm and just getting dark. It was this third member who, when setting off to follow the others, got hopelessly lost on Pant Mawr in the dark.

The main problem for the rescue team was that the Duty Officer at SWCC was not informed by the two companions that the third person had not returned until 8.30pm, three hours later. They had gone to look for him themselves without success and delayed reporting him missing in the hope that he would turn up.

What happened next is complicated but, to cut it short, WBCRT made immediate searches of Pant Mawr, the pot itself, all connecting tracks and roads and particularly Coelbren where people have turned up before. Having found no trace of the missing person by 11.30pm, the mountain rescue team (who were already on standby) were called in. A joint search ensued with cavers and MRT members working together to search the immediate area from SWCC to Pant Mawr Pot and the most likely parts of Pant Mawr. The WBCRT Land-Rover was driven to the highest point at the centre of Pant Mawr as both a beacon and a message relay station between the search teams on foot and the control at SWCC. The mountain rescue Land-Rover was dispatched to search the Sarn Helen Road, but could make only limited progress due to deep ice-filled ruts on the Sarn Helen Road.

As it was a cold night and the missing person had not been seen since 5.30pm, an RAF helicopter with thermal imaging equipment and night-vision capability was requested in case the missing person was injured and immobilised. At 3.30am, just as the helicopter was about to arrive, the police reported via control that the missing person had been found. The helicopter was re-directed to base and all rescuers were called back to SWCC.

Our "invisible man" had stumbled into the Farm Café at Henrhyd near Coelbren and was picked up by the police and brought from there to SWCC. The café owners would not let him in and had called the police (would you let an incoherent man in a yellow suit into your home at 3.30 in the morning?). He was taken from SWCC to hospital suffering from a combination of exhaustion and mild hypothermia. We were unable to ascertain what exactly happened to him, and he was unable to tell us, as he had no memory of most of the ten hours that he was missing.

For my own part, I was extremely pleased (apart from not getting home until 6.00am) with the way things worked out. The missing person turned out to be uninjured, both rescue teams worked well together and the joint communications were outstanding. Sue Mabbett did an excellent job of Control for WBCRT and liaison

with the MRT leaders and members of our team involved were calm and efficient. We had not called out people generally as we had more than 20 WBCRT members present including five wardens. On reviewing our decisions and actions throughout the following week, we felt that we had done everything that we could have done.

The main lessons were :
* The party should never have split up. Better to be a little late all together and have a 30-minute call-out involving five rescuers than a ten-hour call-out involving more than 40.
* The ticket should not have been removed from the SWCC board until all members of the party had returned. This is difficult for a Duty Officer to control as people often take their own ticket off without the D/O knowing. However, it can be stressed before a party leaves.
* The Sarn Helen track has become almost impassable, even to a Land-Rover, due to the continual damage done by weekend off-roaders.
* Finally, once again, someone lost on Pant Mawr has turned up in Coelbren. This is worth remembering for future reference (yes Bob Radcliffe, that is what you said would happen).

We have received letters of thanks and apologies from both the unfortunate "missing person" and one of the party who left him and following a recent telephone conversation, we now have a better understanding of the reasons behind what happened that night.

Cave Rescue Practice - Bridge Cave/Little Neath River Cave, 13/9/97.
by Steve Thomas
The original intention was to pull a supposedly injured diver from the New World area of LNRC but this fell apart at the last minute as two of our divers had work commitments remove them from availability a couple of days before the event. As it turned out, this was quite beneficial as we learned a lot with our scaled down affair and we have prepared the way for a full-scale practice from New World. The day was divided into a number of segments, two of which involved cave diving. From our point of view, this was to be very important as a major advance was made in the one-diver-to-one-casualty approach to things.

Phil Short and myself were to be the only divers as any more would have been a boring affair for all as we got the nitty gritty out of the way today. The first thing we both wanted to experience was to take a non-diving trained casualty through a short easy sump without them assisting themselves. This was regarded by us as being relatively safe through a very simple sump but at no point were our two volunteers to be pushed to do anything they didn't want to. We entered Bridge Cave and went to LNRC through the sump. Here we established communications with the party in Bridge Cave and on the surface using the 'phone line that runs through the sump. We then got the first of our casualties (Brian Bowell), who had come in through Flood Entrance, and went through all the kit and a basic tutorial. After kitting him up we entered the water, went through basic submersion, established that he was happy with what was to happen and sorted out all underwater communications. As we were a mask short, Phil dived without one. He was on the heavy-duty line with his left arm firmly under Brian's armpit. On Brian's left side I firmly held his other armpit. As a three-wide unit we went through the sump to Bridge Cave. We then returned and repeated the exercise again with our second casualty. There were no problems and both obviously enjoyed themselves.

Next, we put Phil into Jopo's new torso stretcher. The spinal splint was attached first and then the stretcher whilst Phil was fully kitted in 4-litre bottles and a standard British harness. The object was to get him through the sump with just one diver. The original idea was to haul by the top of the stretcher and a short lanyard was attached for this purpose. Phil was face down with his arms free (as is always the case for our rescue practices) and a number of different techniques were tried during the journey through the sump, but it ended up with me finding it easiest having my arm around the stretcher. On the return I basically swam through the sump with Phil tucked under my left arm. It was comfortable, relatively easy and safe and was very encouraging. If one diver is to attempt a rescue through a difficult sump then this has to be a technique to consider. There was no real depth involved, or any obstacles, so it needs to be tried in a variable-depth sump which will involve adjusting buoyancy which will obviously complicate things somewhat. Nevertheless we are optimistic that it could be quite successful. A diver in a drysuit might solve this problem quite easily. We were intending to swap roles but it was quite obvious that I would not get into the stretcher as I was using larger (7-litre) tanks and the "American system" of harness so we need to modify the stretcher so that it will work with all (or most) diving set-ups. Jopo has done a fine job with this new stretcher and we look forward to future developments.

Many thanks to WBCRT again for their invaluable support, especially to Gary Evans and Brian Bowell for their endless enthusiasm and effort.

Combined WBCRT & Gwent CRT Ogof Draenen Familiarisation day, 26.6.97
by Ian Wilton-Jones, GCRT Training Officer

28 members of GCRT and WBCRT met at the Lamb and Fox car park. The objectives were:

1. To familiarise members of WBCRT (in particular) with Ogof Draenen and to consider the problems relating any rescue from it.
2. To radio-locate various points within the cave, thereby saving the effort in laying cables underground between the entrance and these points.
3. To conduct a small scale practice rescue if enough cavers attend.

The Day's Activities:
25 members went underground in groups of between three and six, each with a leader who was sufficiently familiar with the area of the cave between the entrance and the Nunnery. One group was assigned the task of attempting to communicate with the surface using a Molephone. Three members remained on the surface in order to carry a similar molephone and attempt to contact those underground.

Debrief
* The major concern raised was the serious number of boulders almost all the way, making a stretcher carry very arduous. It is possible that rescuers would suffer ankle injuries during an evacuation since the momentum developed by the stretcher could cause members to overbalance. WBCRT members suggested that the stretcher be passed from one group to the next, and then the back group move forward to the front in order to have the stretcher

passed to them. This system has been adopted in OFD in certain places, and works well. A controller should be appointed (NOT the medic) who should stand outside the group and view the proceedings, as s/he will have a better view from there.

* Some work may be necessary in the route out from the Chapel if an evacuation required the temporary re-opening of the so-called "Pirate Entrance".

* Indiana Highway is not the obstacle which was feared. At least one group made a journey along the bottom, which was quite navigable except for the odd pile of boulders.

* The streamway in the entrance could provide a severe obstacle for a casualty with even very minor injuries. The successful diversion of the stream using "laid-flat tubing" would be an immense benefit and this should be purchased.

* The idea of bringing a casualty with a broken neck/back up through the entrance series without a stretcher had been suggested but the idea was rejected unreservedly by the medics in the room. If the entrance series cannot be enlarged, the only exit for this kind of casualty would be via the Nunnery.

* The BAC streamway is an obvious place for using a floating stretcher (or a couple of airbeds). The exit from the cave using this method could be accelerated greatly in BAC and sections of Agent Blorenge.

* It was suggested that Beer Challenge Crawl was a better exit route than the main route from T-junction if the casualty were being evacuated via White Arch. This would involve digging out the mud floor of the crawl and should be a comparatively quick and easy activity, at the time.

* In such a large cave, many of the helpers would not necessarily be sufficiently *au fait* with all the routes. A suggestion was made that (conservation) tapes be used to guide rescuers at awkward junctions.

* With such large numbers required for any serious rescue, using the techniques described above, feeding of the rescuers could become a serious issue. It was felt that personnel from the Cwrt-y-Gollen army camp would be able to help organise it.

* The exercise with the Molephones established good voice connections between the surface and beyond the Chapel, and also with two places within Arms Park. Communications deteriorated as the drizzle increased, with the equipment becoming more and more damp. In reality, it could be set up inside a tent in poor conditions. The discussion extended to means of retaining communications in the event of a Molephone failure. Wire with amplifiers was one suggestion. Also, bat entrances are expected to be built in due course and it would be possible to run wires through any pipes, run through from the outside, thus enabling "hard" communications.

Actions
* Purchase of laid flat tubing.
* Molephone positioning points should be properly marked within the cave.
* Building of an action plan for rescue within Draenen, using the points outlined above

Take Your Partners Please for the Lifeline Shuffle

by Clark Friend

As Saturday 18th January dawned a typical, early Welsh Spring day following a modest deluge, it was unanimously agreed by the 20 participants that the practice should take place underground. We were prompted to consider carrying a stretcher along Bolt Traverse in Ogof Ffynnon Ddu I on the basis that we could only use the "Escape Route" for an evacuation due to high water. This had two advantages: it had never been done, and the site would also serve as a test of the method for use at other locations. A short brainstorming session (indoors) considered several possibilities, but set the proviso that no new bolting could take place. We came up with a "lifeline shuffle" as a potential method, where the two ropes attached to the stretcher (and casualty) are alternately the haul rope and lifeline. The rigging would be via pulleys which would utilise the Rawlbolts holding the steel traverse wire. The concept is that the stretcher is lowered on the furthest rope, the nearest acting as a lifeline, until a V-hang is obtained. The furthest rope then becomes static and the nearest rope becomes the haul rope to raise the stretcher to the pulley. At this point it is then locked off and the further pulley moved forward, re-engaged and the process starts again.

The police were alerted to the practice commencing and the Land-Rover began the transfer of personnel to the entrance. On arrival at the cave it was decided to lay a 'phone line from the Land-Rover to the entrance and thence to the haul site. A reel of cable was taken in to commence laying from the haul site out, in order to cut down the time that information started to be returned to the Club HQ via radio. Thanks to Claire Hicks for volunteering to stay with the Land-Rover and supporting us by manning the communications relay whilst the rest of us kept warm underground.

Once at the site it took a relatively short time to decide what to do regarding the haul. It was obvious that the chosen method would not be that used at this particular location during a real incident because the ledge is wide enough to move the stretcher by other methods. However, it was accepted that we would carry out the shuffle to see exactly how it worked. An additional safety line was rigged through the traverse first, from Helter Skelter Passage round to the Maypole Traverse. The pulleys were attached to two of the bolts nearest the ladder at the upstream end of the traverse. A willing casualty, Rocky Stone, was made comfortable and attached to the stretcher which was then attached to the lines. A hauling team was established in the right-angled passage at the downstream end of the traverse.

It was obvious that communications between the stretcher and the hauling team would be difficult. Even though the streamway was not in fact excessively high, the noise was sufficient to prevent direct end-to-end communication. It meant that there had to be an intermediate relay with all the inherent problems of controlling two lines. Those with megaphone voices were deployed after agreeing a set of commands.

When the haul commenced, it quickly became apparent that the method would indeed work. The first point was that the lines must be properly tensioned before any lower is started. The first lower and haul went well but on locking off the first snag emerged during the procedure for the pulley change; the method chosen was uneconomic with rope and there wasn't enough. A cow's tail was attached to the stretcher and clipped to the traverse wire. The furthest pulley was then removed and re-inserted into the line to

move closer to the haul-site. However, because the haul lines were attached to two points on the stretcher it rotated through 90 degrees, so placing the "casualty" face to the passage wall. This had not been foreseen. The second lower and haul worked well and a new system was developed using a third pulley. This was inserted near the stretcher and the line pulled forward. During this a loop of rope was thrown around the stretcher which took time to clear. Once attached the furthest pulley was removed and passed forward.

The communications were a problem, as expected. The problem was compounded as there was only one hauling team and they had to change from rope to rope. This inevitably led to problems in trying to stop quickly and delays whilst a change-over was accomplished. This was particularly difficult because the change-over system produced large amounts of slack. Subsequently, the pulley changes worked very well (with the casualty rotating and the loop being cleared) and the recovery to the safety of the right-angled passage was accomplished inside ninety minutes.

At the debrief the following points were considered:

1. That the random selection of people who turned up gelled well into a working team and demonstrated that a method not previously used by any of the participants could be successfully utilised.

2. It was obvious that the stretcher must be rigged from a single point. Probably the best thing is to get both lines to a Y-hang, back each up to the stretcher as well as taking each down to the casualty.

3. The initial pulley system used was poor as it was too rope intensive, and the modification was poor because it threw a loop around the stretcher. It would seem best that the third pulley is inserted in front of the stretcher and once there, with the stretcher attached via the cow's tail, the rear pulley can be disengaged and moved forward. This will still not prevent large amounts of slack being produced.

4. Friction and rub points were numerous:
- On the lower and haul there was frequently friction against undulations on the passage wall.
- Due to the shape of the passage, the haul was being accomplished round a ninety degree bend and some better system to reduce the rub here needed to be sorted out.
- There was also rope-rope rub along the traverse as both lines are parallel and essentially occupy the same position.

If a real incident was to occur it might be that many of the latter rubs could be reduced by new bolting, which was not warranted in a practice.

5. A barrow-boy would be essential to ensure no snagging at the bottom of the lower and the subsequent haul, and to protect the casualty's face. They would be in a very exposed position and unable to do anything to help themselves. It could be that the best person (if able) for this task would be the first aider assigned to the care of the casualty.

6. Some care needs to be given to the positioning of the stretcher at the top of each haul as it was often pivoted in space off the main ledge. This could become rather uncomfortable for a casualty.

7. Some concern was expressed that there were rather too many bodies attached to both the safety line and the traverse wire. This might be viewed unacceptable. Given the proviso of no new bolts it was difficult to see how this could have been alleviated.

8. Perhaps the biggest problem was that there was room for only one haul party to work both ropes. Further, the method of communicating with them (those with megaphone voices) needs to be rethought as it may not be good enough for a genuine situation.

9. Communications between the haul site and the relay station worked well and messages were transferred back to keep HQ informed of progress.

All agreed that it was a worthwhile test and that the general sequence of events has been refined. In the event of a real incident it is clear that the traverse would be rigged in advance and so some of the time would be cut down.

OTHER ITEMS

Blue Tubs and Mars Bars - a Guide to WBCRT Rescue Dumps. (WBCRT - to our members we are the 5th emergency service).

by Brian Bowell

On your excursions through some of the larger cave systems in the WBCRT area, you may well enter a perfectly normal passage or chamber and trip over a large blue tub. Nursing your injured bits and cursing the inventors of these containers you might think "What the bl**** h*** is that doing there?". A good question, but look at it another way. You and some buddies are on a trip to Smith's Armoury and one of you trips over a large blue tub, resulting in a broken ankle. This is where the large blue tub comes into its own, so to speak.

The tub is full of goodies to keep you happy until the rescue team arrives. While some of your companions go for help (what's the minimum number for safety? - a free rescue for the first correct reply) the injured party and friends can be warm and fed. It's all part of the service. WBCRT has placed dumps like this in three of the larger systems in our area.So, where are they, why are they, and what's in them? A complete guide to the official rescue dumps in the WBCRT area follows...

There are three of them: in Sand Chamber in Little Neath River Cave, Boulder Chamber in Dan-yr-Ogof and Smith's Armoury in OFD III. The Dumps in LNRC and D-y-O are intended to provide comfort for a party trapped by flooding. The OFD III one is to provide comfort for injured or exhausted cavers at the far end of this substantial system.

They are large blue drums with lids clamped shut to keep them dry. In them are stoves, kettles, lighters, food (shortly to include a vegetarian selection) and candles. The LNRC and DyO ones also include a rescue telephone with batteries and operating instructions. Nearby is a phone cable. The 'phone can be connected to this and the rescue team will use it to communicate with trapped parties. Also nearby will be exposure bags and foam mats. The dumps are checked and restocked twice a year.

There are a few rules about these dumps that it's useful to restate. They are for distressed cavers only, they are not snack bars. If you are notinjured or trapped, leave them alone. If a party becomes trapped by flooding in LNRC or Dan-yr-Ogof and is not injured or distressed they will not be evacuated. They will be expected to sit it out until the water subsides. (The reason for this is that evacuation from a flooded entrance involves divers, fire engines

with pumps and loads of other cavers; in the case of LNRC there would also be considerable inconvenience to the land owner. In the circumstances described above the party should connect the telephone and await contact from a WBCRT team. You did leave word of your trip with somebody responsible, didn't you?

From time to time cavers may encounter similar caches of food etc. in other caves. These are not WBCRT collections and we bear no responsibility for them. Their contents may have been quietly festering for a long time, and they should be treated with care.

It's very likely that you will never have to use the WBCRT dumps, but it's comforting to know they are there if things do go pear-shaped.

WARNING - Figure-Eight Descenders Can Break Karabiners
by Brian Jopling, Equipment Officer WBCRT and MRC representative on the BMC Technical Committee.

This report is a condensed version of a report by the BMC Technical Committee which investigates equipment failures. A copy of the full report may be obtained by sending a stamped addressed A4 envelope to:Brian Jopling, 31 Holbeche Rd., Sutton Coldfield, West Mids. B75 7LL

Background

An equipment failure resulted in the death of a student at a outdoor centre. All of the equipment used was standard and in good order. A sit harness was in use, with a belay loop to which the figure-eight descender was attached by a screwgate karabiner. The rope was a static rope. The student was a novice who had learned to abseil the previous day and was now taking part in a 40m sponsored abseil. No safety rope was used because a high speed abseil precluded the paying out of a safety rope quickly enough. A instructor was at the bottom to apply a brake load to the rope in the event of a problem.*

The student made a couple of false starts - 40m is a long way to a novice - and then launched into the abseil. Almost immediately the student became detached from the rope and fell to his death. The figure-eight was still on the rope near the top and the krab was still on the harness with the gate open but with a NOTCH IN THE SLEEVE. The sleeve was still fully screwed up. The notching of the karabiner gate had been noted before but the cause had not been established.

The following conclusions were drawn by Neville McMillian, Chairman of the BMC Technical Committee, from the instructor's report and trials carried out under controlled conditions. In the full report Neville draws attention to the consequences for outdoor centres and climbers which are not included here. The student had made several false starts allowing the figure-eight and karabiner to become slack on each occasion. The small eye of the descender had moved over the karabiner gate and had been corrected by the instructor at least twice. On the fatal instance this was either not noticed or not corrected fully. When the gear is loaded with the eye in this position there is a tendency for the descender to turn over and take up an abnormal configuration, as can be seen in fig. 1. In this position the karabiner can be loaded axially and apply leverage to the gate. Under test conditions, with an unscrewed gate, it can easily be shown that the eye can open the gate allowing the karabiner and figure-eight to become separated. This does not happen on all occasions but a simple trial will show how easily the abnormal configuration fails to straighten itself out. Tests were carried out using a tensile testing machine,

Fig. 1

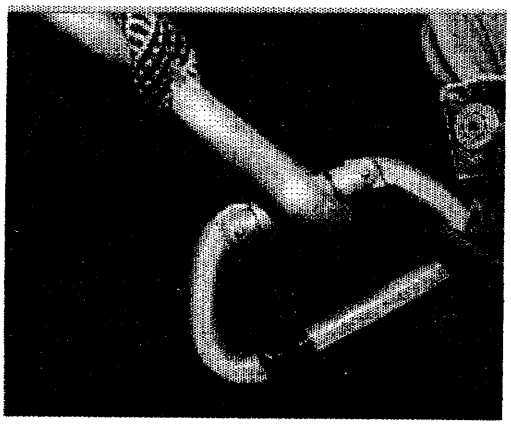

Fig.2

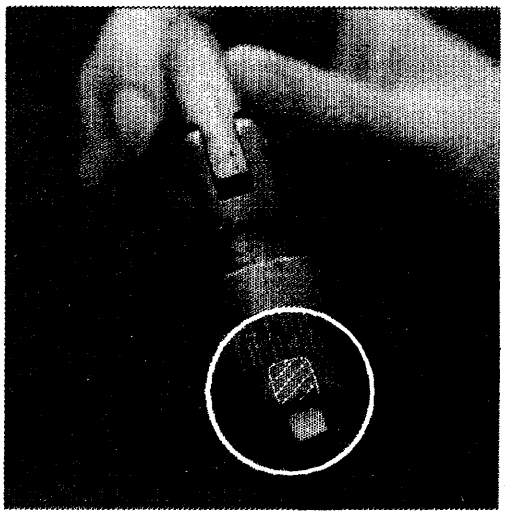

Fig.3
(position of notch circled)

using a new karabiner of the same model and the following results were found. The peak failure forces (the forces required to break the sleeve) were:
Test 1; 0.77 kN **Test 2**; 1.04 kN **Test 3**; 1.03 kN.

The damage to the sleeve was identical to that seen on the karabiner damaged in the accident. The student weighed 98kg which equals a gravitational force of 0.96kN. He therefore could apply his body weight WITHOUT CAUSING A FAILURE in the

abnormal loading situation but a sudden loading would cause about twice the 0.96 kN force which would easily break the gate as described. The area of damage is shown in fig. 3. It is noted by the author that the hypothesis can never be proven but *This hypothesis is considered to be the most likely explanation of the events.* The author also notes that although this abnormal configuration can occur when using a Maillon Rapide there is much less danger because the maillon can withstand a three-way load better and *the construction of a Maillon includes threading to both sides of the gate which obviates the need for a thin sleeve as in a screwgate karabiner.* **

The Potential For a Similar Accident When Belaying.
Since the accident described above there has been a report of a non-fatal belaying accident in Germany. The damage to the karabiner sleeve was reported to be identical - a notch in the screwgate sleeve. Neville McMillian notes that this failure mode must be a rare occurrence as is does not seem to have been noted before and suggests that a short tape between the figure-eight and the karabiner would prevent the abnormal loading.

I have been surprised at just how easily this type of loading can occur. Try it for yourself and see. What is common is that the rig will often pull back into line, how many have heard the "click" at the start of a figure-eight abseil? I have found that all abseiling devices that use a hole or slot can reproduce this failure mode, or another very similar mode, where the bottom of the hole or slot (in the device) can lock behind the back of the sleeve forcing the top edge of the hole or slot to lever directly onto the gate and can easily exert enough force to notch the gate WITHOUT THE TWISTING MOMENT, see fig. 2. A feature of this mode is that the karabiner and descender are "in line" and from above can appear to be safe.

Several teams use the figure-eight descender to belay stretcher lowers or to protect a haul, certainly the WBCRT does, and I would recommend that those who do examine their procedures to ensure that they are safe. The WBCRT is actively looking at rescue belaying, made more urgent with the reports of the failure to hold rescue loads with many common devices and/or techniques.

AS A INITIAL RECOMMENDATION I SUGGEST THAT WE SHOULD BELAY FIGURE-EIGHTS USING A LARGE MAILLON TO CONNECT TO THE ANCHOR.

* I personally find this method of bottom belaying to be extremely suspect and even more unlikely to succeed when attempting to stop a high speed abseil. It appears to me that this can only succeed when the bottom belayer applies a load right from the start.
** My italics.

GAS IN MINES

by John Lister

Old mines rarely have good or adequate natural ventilation, and often have the presence of gases which are detrimental to life. Unfortunately not too many cavers appreciate these facts.

All old mines are liable to have an atmosphere deficient in oxygen- due mainly to the oxidation of minerals, timbers or ironwork. The only source of oxygen for these processes is the atmosphere, which if it is not replenished or replaced by means of a draught can lose so much oxygen that it cannot support life. Normal air contains about 20.7% oxygen, you struggle to breathe at 16%, at 12-13% you quickly pass out, at lower percentages you die. Most importantly you cannot detect the deficiency without a proper meter or lamp. Crudely, if you can't light your fag, you're in trouble!

Carbon dioxide is present in air, in fact you breathe it out. It is heavier than air or the other component gases of the atmosphere, and in a confined space like a mine with no draught, the gas will sink into the low places-pits, shafts, wells and such like. In so doing it displaces oxygen, and since carbon dioxide has no smell, taste or colour it is undetectable to humans. It is possible to climb or walk down into a pocket of gas with such high CO2, and low oxygen that you pass out immediately and die.

Mines in coal bearing areas, and to some extent other minerals, or with a lot of vegetable matter (timber, rubbish) can have the presence of methane, hydrogen sulphide or carbon monoxide. Methane is lighter than air so it can accumulate in high spots, it is explosive between 5% and 15%, and in higher concentrations it can displace the oxygen- it won't explode then but you still die. It is colourless, odourless and undetectable to humans. Carbon monoxide can occur after a fire or a burn in low oxygen conditions, e.g. in the waste areas of coal mines. It is- wait for it!- colourless, odourless and undetectable to humans. It also happens to be very poisonous, bonding with the haemoglobin in your blood and denying your body oxygen. It is slightly lighter than air. Hydrogen sulphide is heavy, it can collect in low places, it is toxic and between 4.3% and 46% concentration it will burn. The human nose can detect the rotten egg smell at a concentration of about one thousandth of a part per million, however the first effect of a whiff of this gas is to knock out the olfactory senses - ie your sense of smell!

Precautions for Rescuers
Do not enter mines which are in coalbearing areas without a functioning gas detector, **the knowledge to use it** and some form of breathing apparatus to get you out. In south Wales this is the area surrounded by the limestone and millstone grit. The limestone runs in a ring from Pembroke-Llygad Llwchwr-Fforest Fawr-Llangattock-Gilwern-Pontypool-Taffs Well-Bridgend-Gower. The coalfield lies within this ring, generally typified by the former industrial nature of the surroundings, although this is not always apparent-there formerly were extensive coal workings accessed by levels at Abercrave. If you do enter do not smoke, do not use carbide (am I being too obvious?) do not carry matches, lighters etc and leave your watch behind if it has a battery in it. Not even Rolexes are intrinsically safe.

Enter all other mines cautiously if there is no draught, preferably with a meter or lamp, and do not descend into low places, such as pits, wells or even descending tunnels, you may enter a gas pocket. Travel reasonably well spaced out, if someone ahead of you collapses do not rush to their aid without breathing apparatus because you will collapse as well. Above all, *if in doubt stay out* - tell the Police to call out Mines Rescue service. We are not equipped or trained for such places.

The New WBCRT First Aid Course - A Participant Writes

by Tony Baker

You may have read, in these pages and elsewhere, about the new improved first aid course that the WBCRT have devised and are now operating. As someone who took the course back in December, I thought it might be appropriate to give a candidate's-eye-view for the benefit of prospective future participants. Just what will you be letting yourself in for?A couple of general points; first, this

is not a course for those with no previous first aid experience. If you took the Bangor Scheme "First Aid in Mountaineering" course you are eligible, if not you should look elsewhere in this issue for details of basic first aid training that the WBCRT offer from time to time. Second, if you're looking for an excuse not to go underground for a weekend and think that a few first aid lectures in a nice warm room might fit the bill, think again. This course is intensive and requires a lot of input from those taking part, over the weekend itself and beforehand. And if you want evidence of just how intensive the course is, just ask anyone who was sitting in the Copper Beech on a December Saturday night when a crowd of dazed, bleary-eyed blokes wandered in at 10pm, clutching first aid manuals and mumbling mnemonics under their breath. And they still had Sunday to look forward to!

A couple of weeks before you take the course, you will be sent a video, a first aid manual, a practice exam (with the answers in a sealed envelope) and details of the weekend's schedule. The idea is that you learn all the "theory" from the video and the manual in advance. You really do have to work on this, too - on the Friday evening you face an exam; score less than the 60% pass mark and you won't be taking the assessment on the Sunday, and only those who score 50-59% are allowed to sit in on the rest of the course. The practice exam is included so that you can test your knowledge, in exam conditions if you desire, in advance of the real thing. I didn't do it that way - when I'd watched the video and read through the book a few times, I looked at the exam questions to see how many of them I thought I could answer satisfactorily, then went back and studied the book some more before doing the test again, this time against the clock.

Friday evening comes, and the weekend starts with a demonstration of the head-to-toe examination that those who took the Bangor Scheme course will remember. Learning to carry out this examination thoroughly and accurately is a crucial part of this course - you practise it over and over again throughout the weekend. Missing something when you are being assessed on the Sunday will probably mean the difference between passing and failing, so it pays to establish in your mind the correct sequence for examining a casualty and make sure you check everything, every time. Next comes the exam; the time allowed is thirty minutes and I'm sure I wasn't the only one who found it a struggle to answer all the questions in that time. Then the papers are marked while you slope off to the pub and discuss how it went with your fellow students. Everyone on our course passed, but there's no time for celebration, 'cos by 9.00am the next morning you're expected, breakfasted, bright-eyed and bushy-tailed at your desk for the Saturday session.

Saturday's programme goes right through until 10pm, with brief meal breaks. As well as learning to use various equipment (neck and spinal splints, the Little Dragon, Entonox and so on) you're taught to give intra-muscular injections (and practice on innocent citrus fruits!) and assessed on all this as you go along. Mid-morning we split into groups to, in turn, act out, diagnose and treat the symptoms of various illnesses that you just might encounter on a caving trip (such as diabetes, asthma or heart attack). The "lectures" as such are really discussion sessions (remember, you should have learnt all the theory beforehand) and I found that this was a very effective way of absorbing the information presented, with plenty of opportunity to ask questions and play with equipment until you were satisfied that you were familiar with it. Saturday was a long, tiring day but we were all aware by now that Sunday's assessment was going to be a stern test of our abilities.

Sunday morning's programme, as written, includes time for a resit of the written paper by anyone who didn't quite make the grade on Friday night but as we'd all passed it was straight into practice with bandages and splints and assessment of same. Some of the "patients" were more co-operative than others - Bob Hall was determined to be a nuisance while I was trying to bandage his "badly cut hand", but in a real situation it's unlikely a casualty in pain will sit meekly while you pull them about. The morning includes an assessment of your ability to carry out cardio-pulmonary resuscitation, and then after lunch it's time for the weekend's denouement; The Assessment.

As we sat in the Land-Rover outside Top Entrance waiting our turn, the atmosphere was tense. Frantic last-minute recapping of disparate bits of information is always a sure sign of pre-exam nerves! After what seemed like several hours, the previous three examinees emerged from the cave, and my name was one of the next three on the list. As Gary Evans escorted me down the entrance passage towards the waiting "incident" I felt the same as when I walked with an examiner towards a car carrying L-plates all those years ago.

Those of you who took the Bangor Scheme course will remember dealing with a "casualty" lying under a table in the small common room at Penwyllt. Now you're confronted with a far more realistic scenario; as well as fact that the assessment takes place underground, the casualty will be expertly made up to look like the victim of a real incident and you're told only the circumstances of the accident. It's then up to you to diagnose the injuries, not forgetting to ask all the right questions about allergies, medication, past medical history, last food intake and the events leading to the injury. (Sharp-eyed readers who've taken the course will spot a familiar mnemonic there!) You complete a "casualty card", including all the necessary information and the examiner will then ask you about treatment of the injuries you've found, use of analgesics, safe evacuation, monitoring the casualty's condition and so on.

It was a mighty relief to walk down the hill, feeling that I'd made a reasonable job of my examination and diagnosis and hoping that I hadn't missed anything. It was an even bigger relief to find out that I'd passed, but not everyone who took the course that weekend did, so taking part is no guarantee of emerging at the end with certificate in hand. Regardless of whether or not they passed, I'm sure everyone else must, like me, have ended the weekend feeling vastly more confident in their own abilities as a first-aider. While the Bangor Scheme course crammed a lot of learning into a weekend, this course does that and so much more besides. I'd thoroughly recommend it to anyone who goes caving or is likely to be part of a call-out.

Great credit must go to everyone who has worked so hard to put this course together. Lisa Williams, Gary Evans and Bob Hall certainly deserve special mention but there are many others who have spent a great deal of time training to be teachers/assessors and who continue to give up weekends to perform those roles. Then there are those who helped with and starred in the video, those who give up Sundays to be act as casualties...the list is endless. One final point: on the weekend I sat the course a lady from the Red Cross came along to assess it for accreditation, and the initial feedback was that she was extremely impressed with what she saw. I'd say that was a fair indication of the high standard that this course sets and how much work all those people have put into it.