

SOUTH WALES CAVING CLUB 
CLWB OGOFYDD DEHEUDIR CYMRU



WELCOME TO THE LATEST ISSUE OF SWCC NEWSLETTER

It is with some sadness that I must report the demise of a great intention.

'Never', I said during a decade and a half of SWCC ranting, 'will you ever catch me having anything to do with the SWCC committee, I'm a caver not a politician, blah, blah, blah.'

Well, I'm here to prove that careless talk costs wives, or whatever, and a few comments made at the wrong moment to the wrong people can end up with being elected to the post of editor and, with all the impact of a double-whammy, a position on the committee as a bonus.

Having recently learned to walk upright, I am working on losing my Neanderthal gait, brushing up on my English spelling and grammar and should be in a position to get myself thrown out of the post of editor by the next round of elections (if not earlier).

I recall when I first joined the club, the newsletter was under Tony Baker's editorship and I watched the master at work. On a Saturday night, he would run from Penwyllt to the Copper Beech and then sit sweating nearby as we began drinking. When he judged that we were suitably oiled, Tony would begin his task; he would ask how the dig, the dive, the expedition was going and then whip us into a frenzy so enthusiastic that we would be promising to write it all up for future editions of the newsletter.

Of course, the following morning the mistake was realised but we had committed ourselves and had to do it. But we didn't.

Time went by and articles still hadn't been written. Eventually, the blackness of 'copy date' was upon us and we all avoided Tony like the plague. He would arrive at the pub dripping with sweat and, as his back was turned whilst getting his first pint at the bar, we would be dashing for the toilet or climbing out the windows.

Nevertheless, Tony did an excellent job and we all eventually wrote for the newsletter - so with humble gratitude I thank those who contributed to this issue.

There's good variety in these pages which I hope will inspire the writing of future articles. These can be submitted by email, post or be thrust into the muddy palm of any committee member after a caving trip.

Don't forget, the newsletter only happens because you contribute to it.

Happy exploits to you all,

Steve Thomas

October 2005

Front cover: Steve West traversing Pluto's Bath, OFD 1 by Martin Hoff

Inside cover: Straw formation by Brendan Marris

Rear cover: The hillside behind Penwyllt by Steve Thomas

Opinions expressed in this newsletter are the contributor's own and not necessarily those of the editor or South Wales Caving Club.

SOUTH WALES CAVING CLUB



CLWB OGOFYDD DEHEUDIR CYMRU

NEWSLETTER 124

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This year has seen a number of training events organised for the members of SWCC to improve skills across a range of caving sub-disciplines. There has been an influx of new members into the club and this meant the need for a beginner's SRT course. The older members also needed an SRT rescue refresher, something that everyone using SRT should do every couple of years. These training courses were followed up by a trip to Yorkshire to put some skills into practice and to teach some rigging. For all these events NCA grants were sought and CIC's used to instruct the participants. Many thanks to John Cliffe, an SWCC member and CIC who gives his time for free. The club stayed at the YSG hut and 25 cavers enjoyed a weekend of caving and drinking. There was also a communal curry on the Saturday night allowing trips and techniques to be discussed. A Derbyshire trip was about to happen at the time of writing this article, intended to improve SRT skills and simply to see some caves in another part of the country. The final event in early February was a digital photography course kindly run by Peter Collings-Wells. It addressed this new area of underground photography very successfully. Any suggestions for more training are always welcomed by the training officer.

Bridget Hall

BEGINNERS SRT COURSE

Death in 20 minutes ... a beginner's guide to SRT.



The SRT beginners' course was designed as a two day course, day one at the Bargoed Climbing Centre and day two underground in OFD.

We spent the first day at the Welsh International Climbing Wall. John Cliffe, our instructor started off by introducing us to the SRT kit. The kits, mostly borrowed, came in various shapes & sizes, make and models. We spent a good part of an hour getting kitted up and resized ... literally.

The group then moved on to basics of ascending and descending a rope using the hand and chest jammers. The primary goal was to practice some basic techniques. We were then introduced to the various descenders. Armed with the knowledge, we practiced our moves on some of the ropes hanging around the warehouse. It all seemed smooth sailing until the dreaded mid-rope ascender to descender (and vice versa) switch over. That's when things got ... well, interesting. I seemed to have spent an awful lot of time trying to get the attention of the advanced group practicing the "mid-rope rescue" technique, suspended 3 feet above ground. It was finally up to John to get me off the rope. After a quick lunch break, we moved onto the final lesson of the day - the 12 metre pitch at the indoor climbing wall where we practiced our newly acquired SRT skills.

We started the second day re-acquainting ourselves with the kits. The second part of the course was designed to practice what we had learned. The plan was to rig a couple of pitches above Frozen River. After a bit of a detour, we finally arrived at Gnome Passage. The first pitch was a 10 metre pitch and the second a 25 metre pitch. We split up into two groups, each group assisting Bridget and John to rig the pitches. We then took turns on each of the pitches. I started off with the 10 metre pitch, which left me thinking "... what's all the fuss about, hmmm ... maybe I am a natural." That's until I had a go at the 25 metre pitch. To begin with the step off point was a bit tricky, a few seconds into the descend I had visions of Lord Ganesha as I looked down and saw a couple of lights way down the shaft. My descent from there

on was bit of a start and stop affair. I finally managed to get my courage and descender working smoothly. Once at the bottom of the pitch, I spent some time exploring the passages. Cold and hunger brought an end to my lil adventure. I had to wait my turn to get back up the pitch. Once up, we derigged the pitches before setting back to a warm cup of tea.

All in all it was a well planned and executed training program. A couple of weeks later we did manage to showcase our skills in Yorkshire.

Rishi Mallesh

ADVANCED SRT COURSE

We started with a group of seven on the advanced SRT course with instructor Juliette and we had a variety of purposes, ranging from remembering what SRT is all about to perfecting rescue techniques and how to instruct others. As a warm up we started on the assault course of rope hanging around our warehouse location, with rebelay, knot passing and mid-rope changeovers. Practicing self-rescue tactics we prepared for the eventuality of losing a bit of kit, using techniques relaying on clever bits of back up kit like the tibloc, as well as the more old fashioned prusik knots. We tried substituting hand jammers or stops for chest jammers, using the end of the rope being ascended as a foot loop, and playing with a grigri.

Now we came to the part requiring 'willing volunteers' as we practised rescuing others. Reminded that an unconscious casualty hanging on a rope has very little time to live, speed is of the essence. No point doing it the stylish way if you are too late. The simplest techniques rely on having a spare rope, which in a multi pitch cave is quite likely. Remote rescue is the best way to go, remaining safely on the pitch head whilst lowering off your casualty to waiting hands below. We tried lowering and also tried hauling setups such as the Z-rig. If the complexity of the situation means this is not possible then it is time for hands on action. At this point I got caught standing in the wrong place and became a 'casualty' for a mid-rope rescue involving cutting the rope I was hanging on - twice.

Scary stuff even hanging 2 metres above the ground, but I seemed to be still alive when we finally reached the bottom.

The second day we ventured underground to rig a practise pitch in OFD, and then back to the quarry where we could make use of a great quantity of bolts to get many of us on the cliff face at once, creating a great spider's web of rope. Unfortunately it was one of those days where the cave was certainly warmer than outside, and I was just beginning to get desperately cold when Bob returned with a large pot of tea. I postponed my decent to help consume it, and we then effected a mid-rope refreshment for our instructor by lowering tea down the cliff face in a plastic milk bottle. After rigging a traverse across the cliff face I retired to the ground to allow others to try to traverse the spider's web. All in all a useful refresher course, along with a selection of new techniques to think about that I hope I'll never need!
Jenny Johnson

After a break of some months since my last SRT trip, the advanced SRT course allowed me to get up to speed before giving a very practical series of techniques to get out of most scrapes including one rather scary scenario involving cutting the rope.

Some poor booking by the Welsh International Climbing Wall had left us in a shed for practice but good use was made of the facilities with some interesting rigging on the Saturday. The Sunday was spent half below

ground and half above, with most scenarios being practised. It was a very worthwhile use of a weekend and superb value for money.
Henry Dawson

YORKSHIRE TRIP REPORTS

Lancaster Hole to Wretched Rabbit

Myself, Hywell and Tony (Gosport caver) arrived late and slightly hungover to Bull Pot Farm to change in the freezing cold.

Knowing Hywell's love of SRT I waited until he had abseiled the 35m entrance pitch before pointing out that the clip on my stop had fallen off just as I reached the bottom of the rope. I lied and told Hywell that there were no more SRT pitches to go!

Vague incompetence led to us going down the SRT pitch (with very dodgy fixed rope, which I had to down prussik) at Fall Pot rather than the much easier bypass route. And then we were off, caving at the speed of three blokes who didn't really know where they were going. The passage is big high level passage that keeps crossing the streamway, often with slippery mud traverses around the holes that lead (via about two seconds freefall) into the master cave below.

Then the inevitable happened, the fourth member of our party (a *Mr Phuckup*) made his presence known and we spent half an hour inserting ourselves into various unpromising looking holes and generally confusing ourselves as to where we'd come from. Then we found the Minarets and the route on, so we had a nice sit down and a bite to eat.

The remaining passage slipped away easily and we soon found ourselves at the ladder down into Stop Pot and then into Wretched Rabbit Passage. Now this passage isn't the biggest passage in the

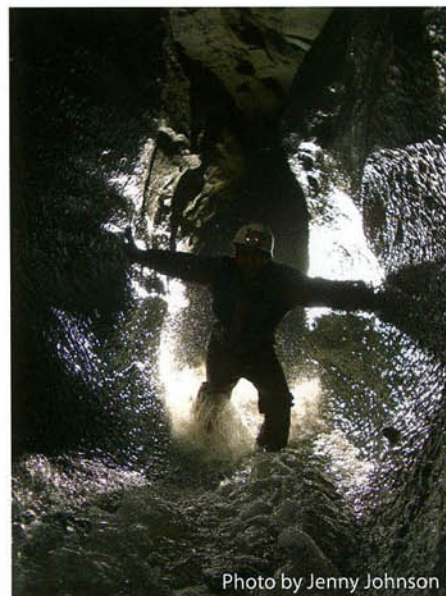


Photo by Jenny Johnson

world, and whilst myself and Hywell could walk hunched over and sideways, Tony was forced into crawling at stream level for a large portion of the passage. Surprisingly the air wasn't turned too blue and we realised that we were again caving with just the three of us when we found the rope climbs up and the cold Yorkshire end coming in the entrance.

This left us to pull the rope out of Lancaster, easier said than done because everything (tackle bag draw string, harness straps and hands) were frozen. Only thing that could have made the trip better is if we'd have had time to go to the tea shop after!
Ben Stevens

Juniper Gulf

Idris and I set off for Yorkshire on Friday night it took about three hours to get there. When we arrived we headed straight for the pub where a number of familiar faces were. Well, the night went on and on. Al and Rhys were getting quite upset as the pub wouldn't tell them that this was the last drink so we stayed in the pub until about 3.00 am. Then we wondered back across the car park or in Mandy's case was given a piggyback ride. We went in to the YSS hut for one last drink before we all left for a well-deserved sleep.

The next day I went on a trip down Juniper Gulf with Rhys, Mandy, Idris and Mother. It was a really good trip I took about an hour to walk there and there was snow all over the ground. I was the least experienced member of the group but Mandy and everyone looked after me. I really enjoyed the trip as it was the biggest trip I'd been on. Although we



Photo by Chris Grimmett

email and including montages via 'layers', amongst others.

did not do the last 60 metre pitch I felt proud. I only had one small hitch on the way down in the entrance pitch.

Then we went back to the YSS hut for really nice food, thanks to the people who made it, as it was much appreciated. I have to admit after the meal I was shattered and I was asleep first by about half nine. The next day I did a pull through trip, not sure where though. I went with Al, Hywel and others, it was really fun but really cold - they should definitely heat the water! Then we returned to the hut, packed up and set off home.

Hellen Brooke

DIGITAL PHOTOGRAPHY UNDERGROUND

Delegates: Bob Hall, Jenny Johnson, Ash Burrows, Chris Grimmett, Rishi Mallesh and Brendan Marris. "

Clutching cups of tea and almost awake, seven of us gathered in the small common room. I ran over an outline for



Photo by Jenny Johnson

the weekend and then asked everyone what they wanted to achieve and where they were coming from in terms of digital, and indeed underground, photography in general. Experience varied from no underground photography experience, to film veterans, to those with sophisticated digi-cams and hammerhead slaves. After a few pointers to the benefits and pitfalls of digi underground, we did the cling film and sellotape routine, and set

off to Top.

In groups we shot various scenes



Photo by Peter Collings-Wells

around Gnome and Chasm, trying different lighting angles and flash ratios. Each person took a turn to be photographer/model/flash slave.

Back at the cottages we downloaded and looked at our pics, warts and all. It's good to see the evolution of a photograph as the framing/ exposure/ lighting is improved after each exposure. Digi allows a really fast learning curve. Rishi, who had no underground photography experience was turning out some good work, which with film would have taken several trips to achieve.

That evening I ran over some simple *Photoshop* techniques for cropping, exposure correction, colour balancing, going to monochrome, reducing for

As Saturday had been wet, we were treated on Sunday to a very sporting river in Bottom Entrance, allowing some dramatic backlit splashy shots,

challenging but great fun. Back to the cottages and more downloads and display of results. I enjoyed myself, and feedback was positive, but you'd better ask the 'students'!

The best pictures are on the SWCC website.

Anyone who is interested in a further course should contact Bridget for numbers and me for advice as to which are suitable cameras. There is a lot of info at www.ogof.net/ofd1/photography.html

Peter Collings-Wells

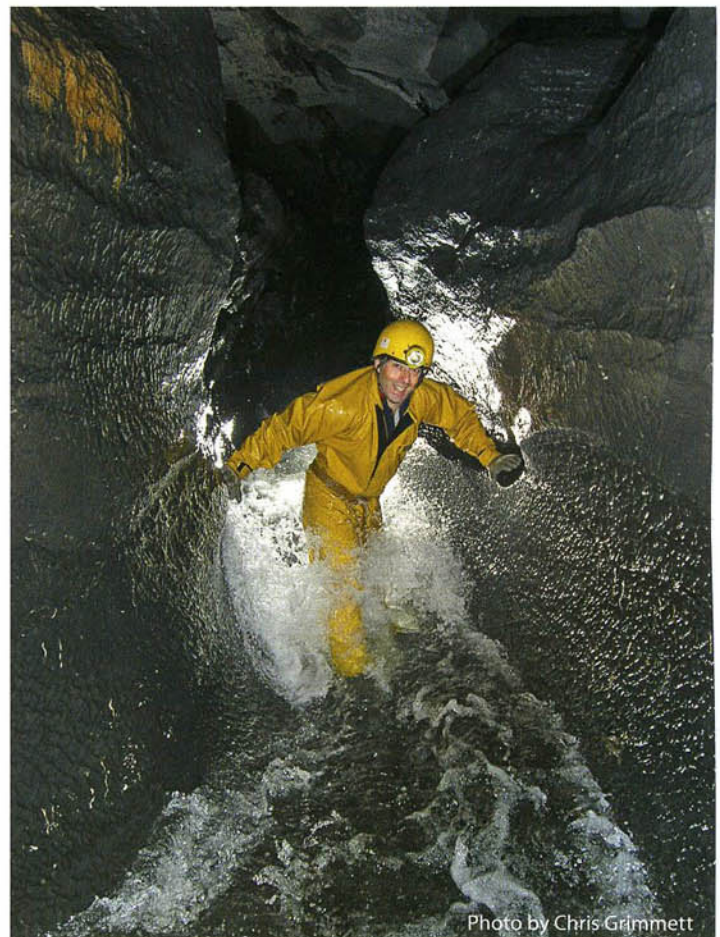


Photo by Chris Grimmett



Photo by Rishi Mallesh



Cave exploration in Font de L'Algaret.

Font de L'Algaret is a nice and quirky cave. It's in a controlled reserve on the island of Mallorca and has an impenetrable gate which requires an official with a key to gain access. We negotiated; "Look, we're nice English boys who want to ensure the cave is understood, please let us in." They agreed. Of course, on the day we had hold ups until we could actually get the gate opened but we did finally get in.

We had an old survey drawn by the original explorers and dated early 70's. The area we were interested in lay beyond a first sump and was an intriguing, inconclusive looking sump 2.

Owen 'Tiger' Clarke, our expedition leader and mascot had arranged this outing and had two keen volunteers to do the dirty work in the shape of myself and Phill Short. Having studied the survey in some detail we entered the cave and were very pleased to find that it was entirely stooping height or crawling.

"Oh well, only several hundred metres of this and we'll be at the sump!"

Very quickly the stooping/crawling passage led to stooping/crawling passage in very cold water and it was clear that perhaps we should have paid more attention to sections rather than plans when looking at the survey. The two cylinders apiece and full diving kit seemed tedious all of a sudden.

Actually, as we all know, when you're with the right people you can enjoy anything and this turned out to be a lot of fun and the cave was rather nice really, a kind of Southern Stream Passage in flowstone. A bit tedious but we were enjoying it.

Finally, the cave enlarged and we all heaved a cheer until we realised there was a trade-off in the transition from cramped passage to mud. Deep mud. Very deep copious gooey mud. Everywhere. And in the middle of all this gloop was our kitting up area and the sump. There was a crystal clear pool in front of us which was rapidly turning

black with every movement we made.

Attached to the left hand wall was what appeared to be a long shoe lace but which was, in fact, the original dive line. As the sump had only been dived once previously it was clear that this line was old. The other indication of the line's age was the fact that most of it was buried in crystals and had stal hanging from it.

We all glooped forward up to our knees in slop, stopped and looked at the sump.

"I'm going to free-dive it" pronounced Phill.

There followed a moment of baffled silence.

I looked at him and thought, 'Are you mad?' But then I realised this was Phill who virtually lives underwater and is nothing less than a superb diver. Being a diving school teacher and spending most of his spare time underwater in the sea or caves, this kind of comment was to be expected. However, a number of things bothered me.

Firstly, the only information we had about the sump was from the survey which showed that it would be about 10 - 15 metres long but we didn't have any idea of accuracy, and the underwater survey would certainly not have been to grade 5, almost certainly merely a sketch and guesswork. Also, it was clear that the visibility was going to be non-existent once the mud floor was disturbed. The third concern reached my lips;

"I wouldn't trust that line" I muttered as I turned away to find which of the brown gooey masses of mud contained a bag with some kit.

Within moments I heard a splosh, bubbles and half a second later a very musical 'ping'. I turned back to see a rippling muddy pool.



L-R: Gavin Newman, Owen Clarke, Steve Thomas, Phill Short

I looked at Owen.

"Where's Phill?" I asked.

Owen nodded uncomfortably towards the sump pool and said 'In there'.

Phill had done what he'd suggested and gone for the free-diving option. However, it was clear that the line had broken and been dragged in so Phill would have had a few seconds to turn back (assuming he could), pass the sump or, if he was very lucky, find an airbell or some unknown dry passage from within the sump.

We waited for a moment as there was nothing immediately to do and shortly breathed a sigh of relief as we heard Phill's voice distantly coming through a tiny crack somewhere.

"er, help" came the voice humourously.

"Where are you?" I called back.

"Somewhere small, without much air and my face is only just out of the water" came the optimistic reply.

"Hang on" I shouted back and made sure that Owen kept a conversation going with the bodyless voice.



I turned to kit up.

"er, where's my kit?" I asked gingerly.

Owen nodded uncomfortably towards the sump pool and said 'In there'.

Now this really was becoming fun. Phill was more than capable of dragging three or four loaded tackle bags through a mostly unknown sump whilst free-diving but when the line broke and he became lost, the focus was quite logically on finding an airspace. The bags had instantly been dropped into the thick oozy mud floor of the sump.

With no kit to put a diving rig together there was nothing for it but to attempt to retrieve the bags from the sump by free-diving. Or leave Phill there and tell his girlfriend that he had met a nice Spanish girl and she wouldn't be seeing him again. The latter was tempting.

By some miracle, my mask was in a bag which wasn't in the sump so at least I would have a modicum of comfort in the impending misery. I wasn't looking forward to groping through the murk looking for the kit whilst holding my breath and trying to lay out a line but at least there was a line reel in one of the tackle bags.

I looked at owen, "Where the line reel bag?"

Owen nodded uncomfortably towards the sump pool and said 'In there'.

Isn't it funny how a fun day out in the Balearics can suddenly make you wish you were portering cast iron cylinders



... and plenty of murk too

for Martyn Farr at the bottom of Carno Adit?

Now there isn't a chapter that actually states this but if you read the CDG manual you *could* come away with the implication 'anyone who dives into an unknown sump with zero visibility, no air supply and with the intention of fishing for heavy bags in thick mud is a bit of a jerk. If he should try this without a line to guide him back to base he should be called 'Tosser' and is only fit to join the welsh section.'

So, I was a tosser and about to prove it.

Proper thick muddy water is strange stuff. It appears brown when you look at it but stick your face in it with a mask and torch and it's pure black. No number of lights penetrate and it's as black as ... er, black. The Font de L'Algaret sump pool wasn't light mud, the kind that gives a warm grainy brown effect as you swim through it. This one was the proper thick black kind.

'Maybe Owen fancies doing this' I thought. 'But I'd have be really gutless to ask.'

"Owen?" I suggested.

"Yes?" ~~came the lack-of-eye-contact~~ reply.

But I couldn't do it.

"er, ... fancy a pint?" I asked with a pathetic pseudo smile.

Humour wasn't really required but I had bugger-all else at my disposal,

other than my mask. Trying to convince myself that something had to be done to start the process of retrieving the kit from the sump, I pulled my hood on, zipped my wetsuit, put my mask on and swam a body-length into the sump. In the



Mallorca can offer very good visibility ...

blackness I put my hands on the sump floor, felt the smooth comforting slurry with my hands and began to plunge my arms up to the elbows into it. Each time I felt nothing but goo and the occasional small stones in my fingers. With lungs bursting I swam backwards (a technique where you use your hand as fins) and pushed off the roof hoping that I hadn't changed direction in the sump. I surfaced okay, relieved but with no more kit than I had gone in with.

Owen was looking lonely and offered no comforting words but gave a look which said something along the lines of 'tossler'. I thought perhaps I should submit something extra for the CDG manual when I got back to the UK.

Without much delay I took another deep breath and plunged into the mud bath again. With the fear of not being able to swim out, I imagined a straight line ahead of me which was my pretend bearing. Slow movement and concentration took me an unknown distance and I stopped. Plunging my arm into the gloop, I closed my hand around a webbing handle and pulled a loaded tackle bag out of the mud. Wayhay, Bingo! Piece of cake! I instantly lost my composure and imaginary bearing and immediately felt overwhelming dread. Attempting a 180 degree turn in the blackness while hauling a bulky bag proved less than approximate and I knew that I had no idea which direction I was facing.

In these circumstances during a cave dive, there are certain rules to follow, mostly perfected after many scares and practices. If, in zero visibility, you loose the line, the secret is to mark your point and try to get your small emergency search reel deployed by belaying it to

something such as a lead weight or rock, and doing a systematic sweep of the area until the line is recovered. As you can always reel back to the belay you can be fairly systematic in the search if you fail to locate the line immediately. Panic is never far away in these circumstances but hopefully by having observed air safety margins, enough air remains to relocate the line and swim back to base once it has been found.

So I nearly had all that was required to do this except for a lead weight or belay point which didn't really matter because I didn't have a search reel which didn't really matter because I didn't have any air. I did have access to panic and zero visibility so at least I had something from the diving manual text with which to work.

It's surprising how long you can hold your breath, when you have to. With no panic or real pressure, you can mess about in the swimming pool and come up when it gets a little uncomfortable. In a miserable black hole of a sump, you can take the strain a little longer when faced with only one other option. However, moving about dragging a loaded tackle bag with an increased heart rate and adrenaline whilst lost in zero visibility doesn't make it any easier. However, unbelievably, I eventually felt my head break surface and I burst out of the water.

One thing that is with you on any cave dive is noise and plenty of it. Exhausted air from your regulator rumbles past you all the time and even the intake of air has a reassuring sucking, swishing sound to it. Bubbles smashing into the sump roof are noisy and often accompanied by the diver's own grunts and coughs.

In the sump, without the noisy bits of kit, it had been very quiet. I didn't even dare make a grunt in case it caused me to breathe out a bit. After such silence, the sounds back at base seemed surprisingly loud and the echo of my gasping and spluttering was really making the point.

The good news was that I had retrieved the bag but that wasn't the end of it,

I still had more to find.

I thought about how I had managed to come back to base in one piece and how I must have done something right. 'I should be able to do that again,' I kidded myself but of course it was rubbish. I had only fumbled my way back by rough judgement, desperately subduing panic and employing a bit of luck.

However, I had managed to pull enough kit out of the sump to get a breathing set put together so next time I would have a little more time on my side.

The next target was to come back with two bags so I could assemble a proper diving kit and also have the line reel. It's bizarre, but with my basic kit which I would never allow any trainee to dive with, I felt like a proper diver entering the water the second time as I had bits of kit hanging off me and I could breathe. Even if I got lost again, I could spend the time to find the way back (or forward to the other side of the sump).

I groped about again in the mud and did find the other bags fairly quickly and then kept swimming into walls and mud banks until I surfaced back with Owen.

The last few large lumps of mud with a drawstring at the top were cleaned down to reveal bags, the contents of which were quickly donned and at last the prat in a wetsuit actually looked like a proper cave diver.

It was with great relief that the final entry to the sump took place with full diving kit, a line reel and merely the worry of finding our mate. Swimming through the blackness was infinitely more relaxing than the previous efforts and it was with great elegance that I swam straight into Phill's legs and then felt a firm tug as I was pulled to the surface. If you could call it a surface.

Point blank in front of my nose was another nose which was attached to a beaming face which was attached to a head cranked on its side in the few inches of air which resided between the water surface and the roof.

We exchanged the obligatory rubbish about ordering a pizza, what took you so long and rounded it off by insulting each other viciously which always helped us both feel better (this was normal banter for us - There was a moment during the Otter Hole rescue a couple of years ago when we were doing it and Laura, that day's WBCRT customer, became concerned because she thought we were having a row when in fact we were having something of an insult competition as a warm-up to insulting Steve 'you're nicked sunshine' Marsh).

As we were face to face and at water level I could see that behind Phill there was a very low airspace which looked like it opened up so I dived on laying the line and Phill followed, again free-diving.

Shortly, Owen joined us, him too looking like a proper cave diver. Phill was quick to point out that both of us had dived the sump the whimp's way and we were both lightweights. He was probably right.

And so the sump was passed. Probably the longest and most complicated attempt to get three divers through a short sump in history.

We found the cave beyond the sump was free of mud, became spacious with sharp rock and gained altitude. Our objective turned out to be smaller than we had envisaged but the sump pool was in clean bedrock and the water was crystal clear. Sadly, the sump was quite small and it was dived on a base-fed line. I passed one right angle corner and another and got to a small junction where it went deeper. It didn't close down but the base-fed line had run through too many sharp corners and I didn't fancy another lineless dive so retreated. Phill dived to confirm the observations and we called it a day.

A lot of happy abuse-filled banter occupied the journey out and we left a good British 6mm heavy-duty polypropylene line in the sump for future visitors.

I hope they enjoy the mud but avoid our amendments to the cave diving manual.

Steve Thomas



CURIOUS DEPOSITS IN OFD II

Many will know of the unusual white deposit found in several parts of OFD II which is soft and slippery like clay when wet, but is hard enough to climb on when dry.

It occurs, for example, in the streamway of Salubrious Passage, and also in parts of the maze of high passages near the entrance.

Never having seen anything quite like it before, I was curious enough to remove a small sample from the streamway of Salubrious Passage, choosing a wet patch which was easily gouged with the fingers.

This was wrapped in foil from a bar of chocolate and put in a pocket of my boiler suit. Here it remained until I remembered it two days later.

I was surprised to find that in this time it had completely changed in appearance.

The water had drained off to leave a pebble which was rather hard to break, somewhat resembling **Plaster of Paris**. It was, however, extremely light.

The measured specific gravity was about 0.3, which is very near to that of balsa wood or cork.

So this deposit must be one of the lightest of minerals - or would be if it were found naturally in a dry condition! - It is in fact extremely porous with very fine pores, and it is light because it is nine-tenths air.

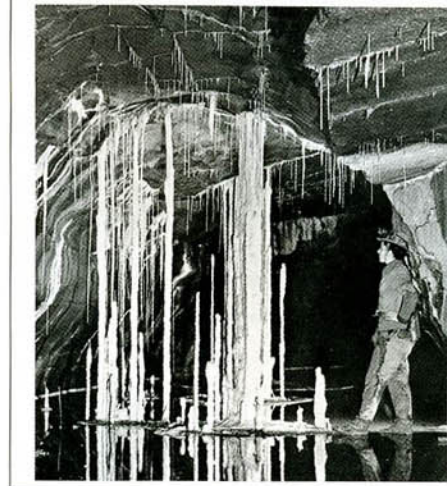
The next step was to find what it was made of, and a drop of dilute hydrochloric acid soon answered that.

Violent bubbling established that it was a carbonate, and other tests soon

confirmed that the sample was 90% pure calcium carbonate, the same stuff as limestone.

The appearance of the material in the cave makes it fairly certain that it was deposited from water. What makes the limestone come out of solution in this form, instead of the usual hard, dense crystals or flowstone?

Here I was lucky in that I was suddenly struck by the resemblance between moon-milk and this deposit in its wet form. The appearance of solidity, the almost liquid-like yielding when pressed, and the very high content of



OFD II deposit.

A colleague of mine, Peter Watts, had the right contacts, tests were made, and sure enough back came the reply that the specimen was riddled with bacteria.

A second sample was taken in a more scientific manner and confirmed the finding that we now know parts of OFD II are swarming with bacteria.

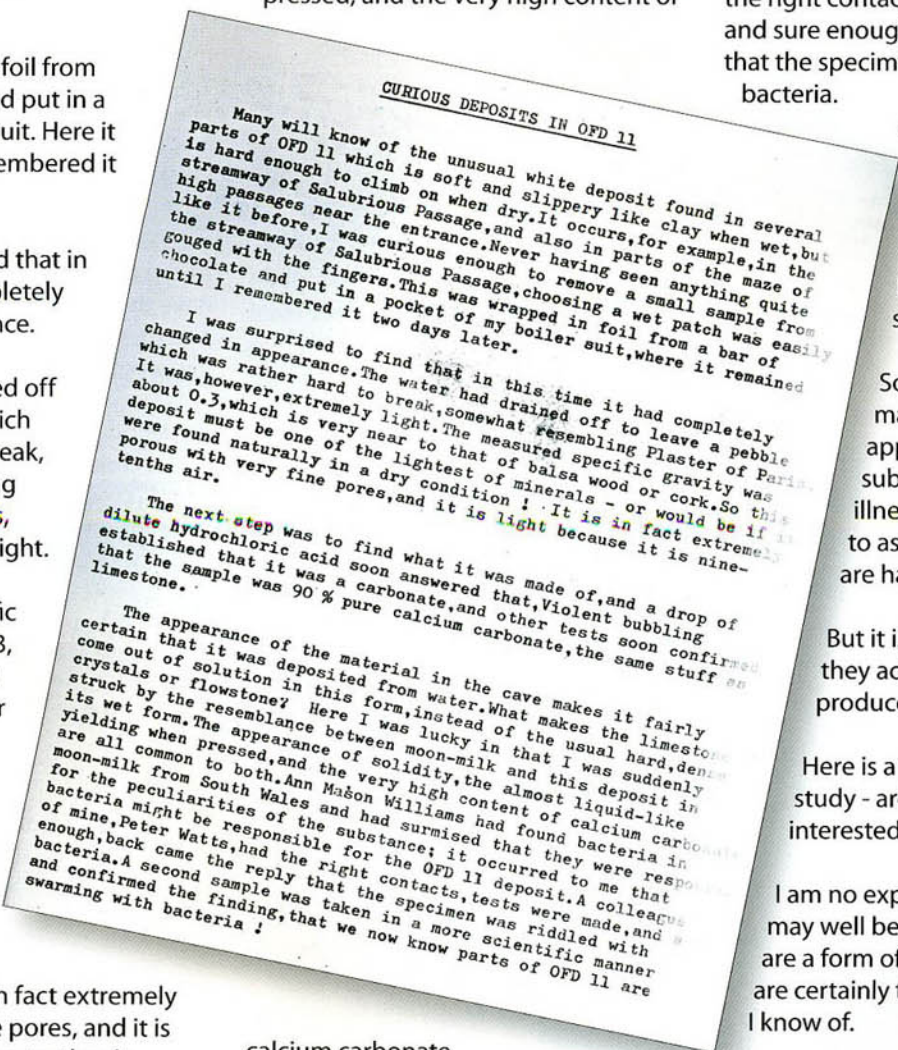
So many people have made trips to the cave, apparently without subsequent infection or illness, that it is reasonable to assume that the bacteria are harmless.

But it is still not known how they act on the cave water to produce this unusual deposit.

Here is a promising field for study - are any biologists interested?

I am no expert in the subject, but it may well be that the OFD II deposits are a form of moon-milk. If so, they are certainly the most extensive that I know of.

Bob Picknett



calcium carbonate are all common to both.

Ann Mason Williams had found bacteria in moon-milk from south Wales and had surmised that they were responsible for the peculiarities of the substance; it occurred to me that bacteria might be responsible for the



by Tony Baker

Some while ago, when Idris Williams was Training Officer, he asked me if I'd be prepared to run a cave photography training event. This was duly advertised in the Newsheet, and the response was enthusiastic. At around the same time, it was suggested that the club run a photo competition, to encourage cave photographers, and so it clearly made sense to link the two. While the competition was not limited to those who took part in the course, it clearly provided an additional incentive to the participants.

I decided to run the training course over two Sundays, as this would allow for pictures shot on the first day to be processed and then viewed on the second (since we were using film rather than digital cameras). Inevitably this created the first hurdle – finding two Sundays on

which all those who wished to take part could be at Penwyllt. There ensued a flurry of e-mails until we could agree on mutually convenient dates.

As the course was intended to appeal to those with little or no cave photo



Photo by Pete Francis



Photo by Martin Höff

experience, I began by explaining a few basics about flashguns, slave units and so on, and then showed some slides that demonstrated basic lighting techniques. Then it was time for some practical stuff: with equipment pooled and the participants in groups of

three, we set off into Ogof Ffynnon Ddu I to shoot. I'd deliberately chosen OFD I as, within easy reach of the entrance, there are opportunities to shoot a range of cave environments. The idea was that each group of three should work together, taking turns to be photographer, model and flashgun-holding assistant. Everyone had one roll of transparency film and access to the pooled flashes and slave units, and I spent some time with each group offering advice and holding flashes as required.

I'd warned everyone to make sure that they each had their fair share of time behind the camera, as it would have been easy for one or two dominant individuals to 'take over' a group and use up much of the time achieving complicated set-ups, but I was

pleased to see that everyone worked well together and all understood the need to pull together to make sure that everyone got their pics taken. One group had to make do with one flashgun and slave less for the last part of the session, after Idris managed to drop it into one of the pots in the streamway; it's still there, if you want it, and Idris duly collected a ceilidh award for the mishap. (The small surplus raised by the event managed to cover the replacement cost of the slave unit.) At the end of the afternoon everyone gave their films to me for processing, and then left to suffer the agonising few weeks' wait to see their results.

We reconvened on the second Sunday and a 'critique' of the pictures took place. I'd mounted up a handful of each photographer's most successful images, along with a selection of the 'failures' so that lessons could be learnt for future



Photo by Brendan Marris



Photo by Pete Francis

photo trips. Rather than sit in judgment of people's efforts myself, I encouraged

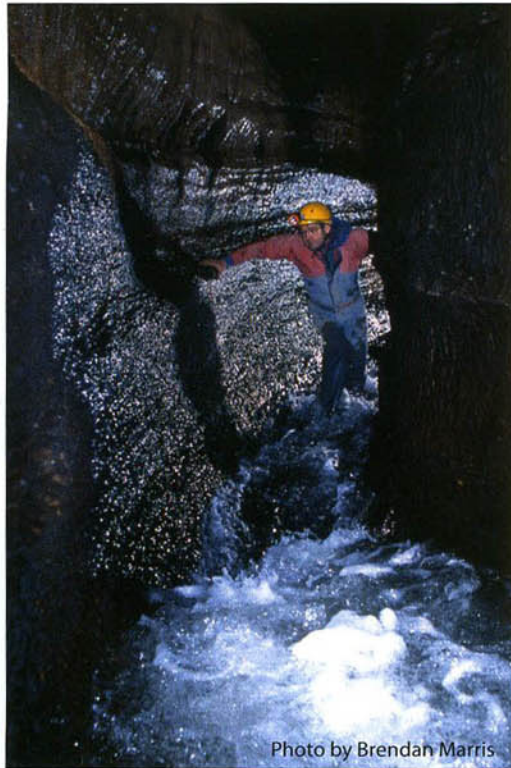


Photo by Brendan Marris

discussion amongst the participants as to what they liked and disliked about each image. Most people were, I think, pleased with their results and there were some valuable lessons learned. Of the pictures that were less

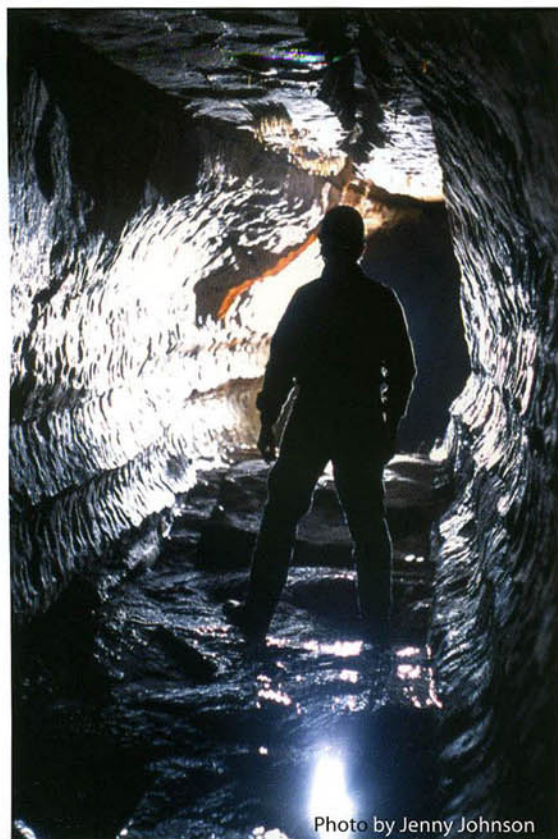


Photo by Jenny Johnson

successful, most were the result of asking small flashguns to illuminate large passages, but another trip underground in the afternoon provided the opportunity to benefit from experience and improve on the first attempts.

The Competition

Timed to run off the back of the photo course, the rules of the competition were very simple: pictures had to be of caves or cave-related subjects; entries could be slides, prints or digital images (although, to facilitate the judging, I asked those entering digital images to supply a reference print – in any case no-one entered a digital pic); entry was open to all SWCC members except those who could be considered 'established' cave photographers. This last rule reflected the fact that the competition was intended to encourage photographers, and

many keen would-be entrants might have been deterred from submitting pics if they'd thought their entries would be up against work from some of those 'big-

name' cave photographers who happen to be SWCC members.

The entry deadline was put back more than once, partly to try and generate more entries but mainly because I managed to temporarily mislay the slides shot on the photo course! When I found them again and other entries had been collected, I asked Jules



Photo by Pete Francis

Carter and Fred Levett to serve as judges, and both kindly agreed. Although I knew that both judges could be relied upon to give fair and unbiased opinions, I still thought it best to show them each image without disclosing the photographer's identity. This way each picture was judged purely on its merits, and it meant that when we got to the final stages and one



Photo by Brendan Marris



Photo by Gary Evans

film-based cave photography, and as digital camera prices continue to fall the risk associated with taking delicate electronic gear into the cave environment will become less of an issue.

Thanks are due to all those who took part in

photographer had more than one entry in the reckoning for a prize, this fact didn't influence the judging.

We convened in the library on the afternoon of the 2004 AGM, which meant that prizes could be awarded at the ceilidh that evening, and I started by showing all the slides and prints so that Jules and Fred had an idea of the number of, and standard of, entries before any were eliminated. On the second run-through, a simple 'yes' from either judge ensured an image's progression to the next round; this weeded out the weakest pictures and meant that a proper discussion could take place about each remaining entry in the next run-through. After several showings of each image, we whittled it down to the few strongest pics and it was interesting to note the differences in opinion between Jules (who is something of a cave photographer himself) and Fred (who isn't). After much consideration, Martin Hoff's shot of Steve West traversing Pluto's Bath was judged to be the winner (see front cover and top right), while Gary Evans's self-portrait, taken at Dollytubs ledge in Alum Pot (with assistance from Toby) was runner-up (see right). Martin's prize – generously donated by Jopo – was a Petzl Myo LED headtorch, while Gary collected five rolls of film.

Recently, Peter Collings-Wells has run a training course at SWCC in digital cave photography and the support for this has ensured that a second is in the pipeline. No doubt the fact that images can be checked straight away will encourage many of those who were previously frustrated by the notoriously hit-and-miss nature of traditional



Photo by Martin Hoff

both the course and the competition, to Jules and Fred for giving their time to judge, and to Jopo for donating the first prize.



Photo by Gary Evans

Whilst clearing out my caving literature for transfer to the Club I came across a copy of the text of the paper prepared by Bob Charity on Ogoff Ffynnon Ddu for the presentation at the 7th International Congress in Sheffield during 1977; together with the original overheads. This extended the work already published in BCRA (Transactions Vol. 4 no 3) and the work is alluded to in our article "Smiths Fractured Limbs" published in SWCC Newsletter 87.

The lecture was based on fieldwork carried out after the papers were submitted for the Congress and extends our ideas on structural controls in OFD. It contains a lot of hitherto unpublished data. This article is virtually the whole of Bob's lecture and has only been slightly modified to make it suitable for publication here.

The fieldwork reported here is only part of the mass of structural data accumulated by us in nearly a year's work, unfortunately there is no prospect of the work necessary for a full publication being completed by the present authors. The main thrust of the arguments developed here were taken into account when I drafted the Ogoff Ffynnon Ddu chapter of "Limestones and Caves of Wales" in conjunction with Pete Smart but the detail were not reported. In the future this work, which was in conflict with the then established opinion, may be subject to further study and reinterpretation. However the data and conclusions such as they are "warts and all" will not be lost for future workers.

The BCRA paper represented the findings of work carried out over the 15 month period up to April 1977. Research since then, discussed here

strengthened our hypothesis regarding cave development and structural controls; this will be the main subject of this paper.

The most important works previously published in respect to structural data in OFD are those of Glennie 1948-50, Railton 1953 and O'Reilly 1969-1973. All these workers appear to draw the same conclusion with regard to tectonic faults and fractures from their findings, which is best summed up in a paragraph taken from O'Reilly's book - Ogoff Ffynnon Ddu. I quote "There are some minor faults developed in this (the southern) limb of the Cribarth disturbance usually with the throw measured in inches, fading out northward and southward. Though of small down throw their location is often marked by extensive Calciting developed on the fault plane. Their trend is usually north-south and provides an occasional oddity in passage direction where the passages are developed along the prevailing joint pattern.

At the beginning of 1976, We joined up to investigate specific dolomite beds in the cave. The area we were concerned with in Nant Newydd Mainstream

in-filled fracture running directly down this passage and where the passage changes direction by 90°, it is found that the passage follows yet a further calcite in-filled fracture. These observations began to interest us in a study of the influence of structural elements on the development of the cave especially faulting. Some subsequent surface investigations by Bob whilst I was underground visiting OFD III, revealed the presence of a complex pattern of southerly plunging anticlines and synclines stretching across the outcrop east of the River Tawe. These observations confirmed the concept of structural complexity of the area.

One such anticline is seen in Hobbs Quarry, which contains many fractures. Passing southward, the anticline can be picked up in Cwm Dwr Quarry where the fractures can be seen. The fractures are here seen to be faulting of normal type with 20 centimeters down throw and associated drag, bedding slip occurs in the downthrown side. Close to Cwm Dwr Quarry Cave entrance yet further faulting is seen. This time of the hinge form with downthrow here of over 3 m and a shatter zone width of 84 cm. (Yet passing further northward,

this same fault 100 metres from the cave entrance shows 17 cm. down throw and a width of only 3 cm.)

Many such faults and fractures were recorded over the whole area and these are plotted onto a map of Ogoff Ffynnon Ddu. Many cave series show a concentration of passages in areas close to an anticlinal axis. This

led us to propose that the anticlinal features were a major directional influence on Ogoff Ffynnon Ddu. At this stage, apart from observations in mainstream, our hypothesis was entirely based on evidence from



Photo by Steve Thomas

Passage is just below Maypole Inlet OFD II and the differential erosion created by variations in magnesium oxide content. However, this is a separate subject: The main thing here is the fact that we observed a calcite

surface exposures. Subsequent work since has been inside the cave to discover if the surface features are recognizable underground.

We began work at the top entrance series of OFD II where there was strong surface evidence of an anticlinal structure. Figure 2 shows the part of the OFD II survey with over 50 dip and strike measurements, these served to confirm the position of the anticlinal axis with limbs dipping on average 9° at $N152^\circ$ and 11° at $N205^\circ$. Having considered this data, the anticline seen at the surface in Weighbridge Quarry, whilst trending generally south, is found to bend towards S.SE as it passes southward. 22 faults and fractures were observed; none of which crossed passages without some degree of solution. These are plotted on the accompanying Rose diagram. Where doubtful alignment occurred, the fracture could later be related to other passages where alignment was strong.

None of the faults showed greater than 20 cm downthrow. Passages whilst following fractures were in most cases not influenced by the natural jointing. Phreatic half-tubes were seen in most passages that were fracture or fault aligned. The fracture infill seen in OFD II that was sampled revealed under petrological analysis, with staining, that fractures were mainly of tensional form and calcite infilled. Some however, particularly in the southern sector showed secondary movement and infill by ferroan- calcite and dolomite, derived most probably from hydrothermal deposition. The whole sequence of filling and refilling is undoubtedly complex and this complex pattern could equally reflect differing depths at the time and thus temperatures of deposition or alternatively the differing magnesium and iron concentrations of rocks traversed by the hydrothermal fluid during differing flushing stages as permeability varied as a result of structural relaxation.

Weaver and O'Reilly in considering the structure of the area show a major fault passing from the sink at Pwll Byfre down through the main part of OFD II to Marble Shower where it

passes southward. Though the area of our survey is restricted somewhat east and west, we have been very thorough in our survey north to south along passages, and from this we can say there is no evidence in OFD II. Discussion with Paddy O'Reilly indicated that Weaver probably postulated this "fault" on the basis of surface dry valley evidence only, as an extension of the known fault between OFD I and II, therefore the existence of the extension fault must now be in doubt.

31 Dip readings were taken in Ogoff Ffynnon Ddu I (Figure 3) and the dip is slightly steeper, but varying in direction from WNW to NE covering a sector of 245° . The grand mean of the dip is 11° towards 177° N. or approximately due south, as deduced and used by other workers – this we now considered an over-simplification and resulted in overlooking important structural details. The detail of figure 3 reveals two distinct average dip directions of 9.5° at 152° N and the other 12° at 202° N.

Before discussing dip interpretation in OFD I, let us first consider faulting in this part of the cave. 'The Fault' as it is referred to in OFD I was the focal point of Glennie's damaging appraisal of fault alignment that probably influenced later opinion. His argument was that it crossed a passage without solution influence. Examination slightly west of this point and northward into the Cathedral reveals a complex fault possibly of hinge form having comparable downthrow at its southern end with that of 'the fault', i.e. 42 cm and 52 cm respectively. The 'Cathedral fault' as we have named it is broken southerly by a slip fault also at its southern end. A total slip of 6 meters (Sinistrally) on the northern block of this fracture would in the first place positively relate 'the fault' and Cathedral fault, also the entrance passage of Downey's Cave and Goethic Passage at the entrance of OFD I. The conclusion drawn here is that 'The Fault' and Cathedral Fault are one and the same and should go by the latter name. Further that major solution has occurred along this fault in Cathedral Passage. The non-aligned portion

is explainable by solution processes tendency to take the shortest path between fractures.

Anticlinal trends west of Cathedral Fault are masked eastward of the fault by hinge movements, which plateau into a shallow synclinal trough beyond the Column along Bolt Traverse into Pi Chamber and the RAWL series. Here the bedding again rises into the western flank of an anticline; the crest of which, from dip readings, so far obtained, must lie slightly east of Waterfall Series. Extension of cave studies beyond the main system into Pontardawe quarries where Whiskers Chamber and Whiskey Aven lie, has lent considerable strength to the in cave evidence of the Pi chamber syncline and easterly anticline around Waterfall series. The quarry in which Whiskey Aven is located revealed northerly trending faults in alignment with the Railton Wilde series and Pi Chamber whilst easterly trending faults are in line with the upper regions of Waterfall Series.

In OFD I, the phreatic association of cave passages with faults is far stronger throughout. Although only 15% of all cave passages were surveyed sampling is such that it is reasonable to extend our findings to the rest of the cave. Rose diagrams summaries our results. Figure 'A' shows the total number of recorded faults and fractures in both OFD I and II and the Rose itself is broken into two distinct categories: fractures and faults that align themselves with passages that are shaded in, and those that do not align with passages - non-shaded, giving an 85% fault-fracture alignment. Figure 'B' splits out from that diagram, the faults observed in OFD I and II totaling 14 and all are passage aligned. Figure 'C' considers fractures only and here, for obvious reasons, there is an increase in passages that are non-alignment the proportion of passages fracture aligned now being reduced to 75%.

However, many of the fractures crossing passages were recognised as 'en echelon' tears that, in general, show little individual lateral extension and are thus unfavourable to the production of phreatic tubes. All three diagrams can be related to Figure 'D' which is taken from O'Reilly 'et al' 1969 in 'OFD'. Here the diagram shows alignment between the passage, fault and fracture trends. O'Reilly has

indicated that the passage directions are consistent with the dip and strike of the area. However, our dip readings shows that dip and strike is highly variable and the natural jointing of the area (classifiable as both tight and close) is visually out of alignment with cave passages.

This, of course, leaves alignment of passages closely tied in with the tectonic fractures and faults which are the theoretical directions of the longitudinal and transverse sets of a north-south trending anticlinal-synclinal system. A third shear set is also seen trending N60°-70°. Dr Coase in his monograph on Dan-Yr-Ogof on the west bank of the Tawe and the northern dip slope of the Cribarth disturbance found similarly trending longitudinal and transverse sets with a shear set trending N 310° - this, of course, being the opposing shear angle in a theoretical anticlinal system. He was unable to relate this oddity in passage direction to any structural feature, but in coupling his findings with our own, stress analysis of the composite data indicates a high probability that the north-south trending anticline-syncline system is contemporaneous with the north east-south west trending Cribarth disturbance.

What of Ogof Ffynnon Ddu III, so far omitted from this discussion? Well, though I am incapable of reaching this sector on my limited caving experience,

my colleague, Noel Christopher, indicates from previous visits to the area, a similar fault- fracture alignment within that Mainstream Passage and in Smith's Armoury where heavy calcite infilled fractures - probably faulted are noted, especially when moving downstream. The latter are but one indicator of many now being accumulated that show the origin of the grit outlier at Silica Pit, east of Pwll Byfre, is faulting and not solution collapse as suggested by Thomas and others. Early, we were able to predict the existence of high-level north-south trending passages around the mid-area of OFD III Mainstream. We were subsequently, pleasantly surprised, to discover that these had already been found. Also predicted, were probable north-south extensions to the Cwm Dwr Series and, though not yet entered (now Ogof Twll Gwynt Oer), they have since been proven by dye test carried out by other workers. True bedding plane controlled passages as suggested by Glennie and other workers are few. Bedding controls are, however, strong in some areas and will be discussed shortly.

We might therefore summarise the initiating controls on development of Ogof Ffynnon Ddu as follows:-

1 Randomly distributed phreatic capillary tubes developed by water penetration at specific inception horizons having

a high solubility and or the presence of pyretic shale in the bedding planes. These are in general micritic beds where bedding slip has occurred or at stylolitic horizons which may be shown in this area to be associated with incompetent bedding.

2 Resulting from differential solubility in the bed rock and the fracture zones, water circulation would be guided by the fracturing, resulting in extended corrosion at such points and the development there of true phreatic tubes, on which of course, the major part of the cave system is based.

3 The main bedding controls in the cave appear to be those which prevent or reduce development (a) by way of competence through high magnesium oxide content (which at present reduces corrosion rate in a considerable length of the Mainstream Passage and (b) thick competent shell beds which appear to have prevented past vertical development in certain sectors of the cave, particularly OFD II. That concludes the presentation. Much work has been put into this research project to date and much more is needed to complete the picture of development in this speleological and geologically interesting area - we believe we have gone some way towards this end.

[AUTHORS NOTE: Throughout Bob uses the terms *fault* and *fracture* almost interchangeably, in his terms a *fault* has an observable throw whereas a *fracture* is a vertical or off vertical crack in the rock with no observable throw both are usually the subject of post development infilling with calcite or some other depositional mineral. The terminology is loose and refers to any carbonate filled directional, joint, vein or small fault without or without observable throw.

The terminology should really be more defined but after the long passage of time this is no longer possible. Also the directional measurements were to magnetic North in 1977 and it is doubtful if any correction to true north was made. I must acknowledge the constructive comments offered on an earlier draft of this article by Keith Ball. The long gestation period for this article cannot be explained other than for me concentrating on stal dating in the area about the time it was originally developed and changing employment shortly after.]

Noel Christopher

On the night of Friday the 13th of August 2004, John Roe, Idris Williams, Rhys Williams and I left Canton, Cardiff to join the second week of the Combined Services Caving Association (CSCA) trip to the Gouffre Berger.

All was going rather well, I even arrived on time and managed to slim down my shoe collection so the four of us and our kit fitted into Idris' car (I did slip in one pair of heels!). It took us about twenty hours, travelling through several rain storms, to arrive at the camp site in Autrans. By this time it was beautifully hot and sunny and the expedition was being run with military precision. We were hoping to chill out, catch some rays and drink some beers - refreshment supply was located, bottle opener was found and chairs were placed for maximum solar exposure, first sip was taken, then Kev found us! "I need somebody for entrance duty". Wanting to appear keen and enthusiastic; "No problem Kev, what time tomorrow do you need us", "Well two of you can go up tomorrow but two of you have to go now". So feeling slightly sleep deprived Rhys and I navigated our way to the entrance, eventually in the dark, and went to sleep in the small surface control tent. All was well until two cavers exited at 4am and one wanted to join us in the tent - Rhys made him tea, chocolate, some food and pointed out the path home!

The next day dawned clear, hot and sunny with the sound of northern cavers approaching and jolly greetings of "Bog roll?", "Where's the food?" "Have you got any carbide?" We sleepily tried to fulfil their requests, though did point out that it was possibly a little late for sorting out your lighting supply! So they departed on their bottoming trip and were a bit less chatty next time we ran into them. Idris and John arrived a little later in the morning to take over entrance duty and we returned to Autrans to prepare for our bottoming trip the next day. I undertook my preparation seriously and made two trips to the cake shop.

Monday was bottoming day for the SWCC four. Progress down the hill to the entrance was brisk, a little too

hurried for the younger Williams who sprained his ankle. Looking to the medical professional for advice; I suggested "Two ibuprofen" and that the best thing for a damaged lower limb was an extra long caving trip. We gained an interloper, John Taylor (JT) from Eldon PC. Thinking he was joining a hard core group, it was necessary to point out that one of us was a giggling girly and another (Idris) was on his first caving trip abroad. JT adapted to the more relaxed pace well. We decided rather than constantly travelling as a five we would split into two; Rhys and Idris moving together and me with the two Johns. Standing at the entrance I was inspecting my SRT kit, scratching my head; "What's up Mandie?" "I don't think I've used this stuff for a year". Worried looks spread through the people congregated at the entrance; "How far are you planning to go?" "Oh, the bottom!"

My heart was really racing as we descended the entrance series, the SRT was straightforward, the pitches were dry and pleasant, even the Meanders weren't too bad. The cave was busy, another group of four were on a bottoming trip having entered at the same time as us and there were three teams already underground from the previous day. We met the northern cavers coming out of the Meanders, most of them had reached the bottom. They were shattered and subdued compared to the previous morning. We all carried on to the base of Aldo's without event and continued into Starless River passage. Proportions were now starting to get really big and the going was easy. We navigated through the Great Rubble Heap with comparative ease and the impressive formations started. You can, however, smell Camp One before you see it! There we ran into the other bottoming group again and Kev's group of four were fast asleep in the sleeping bags. It took us about 3 and half hours to get to this point, spirits were high and we were all keen to reach the bottom. We had a brew and a few snacks before continuing into the Hall of Thirteen where we met the Manchester Uni group. This is by far the best part of the cave, the stalagmites are huge, the gour pools are gorgeous and the

Elephant's Urinal is impressive.

As you drop into the Canals the cave looks different, it starts to feel a bit more ominous and further away from home. For me, the Canals and Cascades were the most difficult and strenuous part of the cave requiring a fair bit of upper body strength and I was not looking forward to doing them on the way back. At the end of the Cascades is a pitch called "Claudine's". This pitch is 17m but has a few interesting features, the one that particularly grabbed my attention was the rusting iron bar that was only attached at one end and had been there since the 1950s. I nearly threw all my toys out of the pram when John pointed out that I was supposed to walk along this to the pitch head. Idris wasn't too impressed with the surprise rebelay 4m off the floor either! He got himself stranded on this for some 15 minutes and eventually Rhys had to come to his rescue, down-prussicking the pitch and brute-force-hauling his father out of the predicament without resorting to pulleys or Z-rigs (who says he's not "tough enough"?). The trip carried on smoothly until Camp Two where we all met up for tea and snacks.

After Camp Two the rigging is slightly less textbook and by the time you get to "Little Monkey" pitch, I suggest not studying it too closely. An interesting thing about this part of the cave is that many groups have not derigged fully this far down and you are faced with an abundance of ropes to choose from, which adds to the anxiety. We all made it to the top of Hurricane, the final pitch, together and there we met the others on their way up. It was quite a long wait for the whole group to come up as one of the changeovers was problematic.

At this point, Rhys decided not to continue to the bottom; "I've been there before". One would think as he had also done the rest of it before he might as well continue to the bottom, however he seemed happy enough to sit on a ledge making endless cups of tea waiting for us to return. The approach out on to Hurricane main pitch is awe inspiring, You crawl on to the ledge which suddenly opens up.

To your right a huge waterfall creates clouds of mist and causes a strong breeze (not quite a hurricane!). My light was swallowed up by the blackness. To add to this eerie atmosphere, the rigging got distinctly tricky, involving a rotting rope ladder on a dodgy rusty bolt! I was ready to turn round and join Rhys' tea party. John Roe pointed out I had gone too far to turn back now so I shakily made it on to the main pitch. We carried on to the bottom. Well, as far as you can go without getting too wet. The sense of achievement was fantastic, it had taken us about eight hours to this point. However, we weren't even halfway and a long ascent was awaiting us after our jubilations.

There is not a lot to say about the ascent, it takes longer and is more arduous than you expect, but there is only one way out! We initially travelled as a five but this just isn't practical with multiple pitches to ascend so we again split into two groups – John and John coaxing me along and Rhys giving his 60 year old father the odd helping tug at pitch heads. We all met again at Camp Two. This was a low point for me, it was 2am, I hadn't eaten or drunk nearly enough and was feeling exhausted (In fact, the rest of the party were dismayed to see how much food I'd taken all the way down and back without eating when they were all starving hungry!). I had had an epic getting off the tricky rigging at the top of Hurricane and it had taken more out of me than I thought. So we had a brew and some distinctly dodgy army rations before continuing.

The Canals and Cascades were easier than I had imagined and we reached Camp One at 6:30am with Rhys and Idris arriving just over an hour later. Amazingly, when we got to Camp One, Kev and his group were still in the sleeping bags, having been asleep for 19 hours! We pointed out that now was a good time to vacate unless they wanted somebody cold and wet to join them. The plan was to have a short snooze then exit. However, we woke at 2:30pm. We knew some bad weather was forecast so tried for radio contact to the surface. No joy until 4pm. The signal wasn't great but the message was "Come out now". So, we made

steady progress through the rest of the cave.

The two Johns and I were having a brew in Cairn Chamber when there was a shout down to ask if the pitch was free. "Come down and have a brew" we



After the trip - Rhys, Idris, John Roe, John Taylor and Mandie

replied. They didn't want tea. They were looking rather wide eyed, a bit damp and were on a race down to derig the cave. Apparently the weather wasn't too great. This was made painfully obvious after they left. We were sitting at the bottom of approximately 90m of entrance pitches when we heard a distinctly loud thunder clap! Despite being shattered, I did some of my fastest SRT to date to reach the outside world after about 36 hours underground.

Our walk back to the plateau was lit by frequent lightning and accompanied by steady, heavy rainfall. We were all very concerned about Rhys and Idris who were still making their way out and were going to be at least an hour behind us – Rhys carrying both tackle bags and helping Idris along. The three of us made it to the camp site in Autrans at midnight and John Roe returned with the car to pick up the others. It was 4am when they finally came back and it was great to see them. Apparently they had heard a large roaring flood pulse whilst moving through the dry passageway of

the Meanders! Thankfully the stream had subsided a little when they reached Cairn Chamber, but they did still get a thorough soaking on the pitch.

The derigging team managed to do as far as the Canals, with the water rising. They were unable to get a weather update and made the sensible decision to exit, thus abandoning several hundred metres of rope and other

bits and pieces. Thankfully, the whole expedition was back in the mess tent drinking the following day when the really heavy weather started. Golf ball sized hail fell and a river ran through our camp site! The Irish team who were tackling the cave next were looking worried, but arrangements were made with them for the return of any of our kit they managed to retrieve.

An SWCC provisional member, Kirsty, was also on the expedition caving with her Manchester University friends. These guys had a very relaxed attitude to the whole thing, managing to include two sleep-overs on a non-bottoming trip!

We all had successful trips. The Berger is a beautiful cave and I highly recommend it to anybody who gets an opportunity to go. It contains all the things we love about caving with very few of the bad bits. It is a hard trip due to how long it takes but it is most definitely worth it.

Mandie Edgeworth



This report is the result of a five-person expedition to Belize, for three weeks during Easter 2002.

The expedition was to follow up the work started by the team of Alan, Phil Walker and Pete Francis of SWCC, who had visited the area in 2001, with some successes:

- Visiting some small communities in the Toledo district, establishing contacts for future expeditions
- Entering several new caves.
- Surveying the new discoveries as well as some locally known caves.

The success of the expedition was limited by its small size. Though allowing us to fit easily into small local communities, it did require extra care and caution to be used in our explorations.

The 2002 expedition built upon this foundation and achieved its aims, though its modest discoveries were due to the effects of Hurricane Iris. Due to it mainly hitting the sparsely populated region of Toledo, there were few reports about it and it wasn't until we arrived we saw its full effect.

Trails usually used by local hunters and farmers had been blocked and had been only opened a short distance into the bush. Many trees had fallen and the floor was littered with leaves and branches, along with the dense new growth springing up, blocking all views and making travel arduous. The locals who knew of caves or promising areas were also busy, completing repairs, or in some cases complete rebuilding of their homes in preparation for the coming hurricane and wet seasons.

Tiger cave, which had been located at the end of the previous trip, was fully explored and a lower series gave some new discoveries, the lakes to the roaring river were also crossed.

Long treks were made into the jungle with limited success, though from these we can now consider visiting sites further into the jungle with easier travelling conditions.

Towards the end a small party visited the awesome Blue

Creek caves, a well-known cave but surrounded by other sites that would be worthy of future attention.

A large portion of the Columbia Branch River System between the sink and Resurgence was thoroughly explored for cave sites. This dry river bed is around 8km in length and over half this length was extensively explored, though without any significant finds.

Many contacts were made in the communities visited that would be extremely useful to future expeditions.

EXPEDITION AIMS

- To discover new caves and extend existing sites.
- To return with a larger team to build upon the 2001 expedition's finds.
- To reconnaissance new areas for future development by other expeditions.
- To establish links with the local communities that will support future trips.

EXPEDITION MEMBERS

Alan Braybrooke, Gary Evans, John Roe, Toby Dryden, Martin Hoff



The inspiration for the 2001 trip occurred on a trip to Ogof Darren Cilau, thinking there must be something better than the, tight wet and cold passages. Belize proved to have none of these, though it had its own horrors, by the end we thought only of getting back to cool off, sleep an undisturbed night and eat a huge meal.

These memories faded and were forgotten when it came to persuading a new team of cavers in 2002, they soon learnt the error of their ways, as meals of a single cheese triangle and sleep interrupted by dogs, chickens, blasting music and crying children led to hysterical emotional collapses.

Now the memories are fading again we can start thinking about the next trip.

BELIZE, THE COUNTRY AND ITS CAVES

Belize, until 1974 known as British Honduras, is a small country about 280km long and 110km wide, similar in size to Wales. Lying on the Caribbean coast of Central America, it has Mexico to the north and Guatemala to the south and west.

Belize is a relatively low-lying country with a coastline of small Cayes and the second largest coral reef in the world. To the north the country is flat as it extends to join the Yucatan of Mexico. In the centre of the country lies a granite massif, Victoria peak being the highest point at 1120m, formed before the surrounding Cretaceous limestone. Then being responsible for the surrounding uplift, which has formed the Mayan Mountains where the main cave development is located. This mass of limestone along with the large rainfall, which occurs during the wet season, allows for a huge potential for cave development. Unlike the Yucatan peninsula that has received attention in recent years, the landscape leaves potential for dry cave development. In fact it already contains the largest cave chamber in the Western Hemisphere; Belize Chamber, in Chiquibal Cave.

Prior exploration;

With geology like this it is well known as a caving destination. The Americans have been active there since the '50's and there have been several UK expeditions, including two by Queen Mary College in '88 and '89 and one by Mendip caving Group in '94.

In 2001 a small expedition from South Wales had visited the Toledo district, initially in the San Jose area, towards the West and the Guatemalan border. This was following up a visit by some cavers from Ireland and was

centred around Gibnut cave which was surveyed and several pitches were descended, giving several hundred metres of large passage. We left this area due to the unforeseen high cost of accommodation and guiding, though there is undoubtedly more to be discovered. Two members of the expedition then relocated to San Pedro Columbia, selected in the field after studying maps, as a promising location. With reduced costs and very helpful locals we continued and successfully made several finds, though only finding Tiger Cave in the last few days. Due to time we surveyed this huge cave system as we explored it, though deep in the cave a fixed rope showed that it had in fact been entered before.



PLANNING AND PREPARATION

With the dry season at its height and steady weather, the best time to visit the country is between February and early June, though due to work commitments we were limited to the period around Easter, this causing the



prices of flights to rocket.

Contact also had to be made with the Department of Archaeology, who control access to all the caves in the country. Initial emails and letters had no response, but a phone call that unexpectedly put me through to the minister for tourism, Mr George Thompson, got the process started. With the great assistance of Renne Torres who has taken on the task of aiding caving expeditions, it was not until the first members of the expedition arrived and visited the Government offices that our permit was granted

Research was also carried out to find out who had previously explored Tiger cave. Eventually it was found to be a team of US cavers who had mounted several expeditions to the area in the early 80's. They were extremely helpful, furnishing us with some surveys, descriptions of areas visited and more importantly areas they never managed to visit.

The collection and redistribution of group equipment to individuals went smoothly, avoiding having to freight kit, by making use of the huge baggage allowances given on US flights, far more than mortal man can carry. Expedition Area

From our research, it became apparent that many groups had focused their attention around the Vaca Plateau, where the greatest systems had been found. This basin in the surrounding Mountains was an obvious choice, but to avoid repeating work we decided to travel further south into the Toledo district which, having poorer links to

the rest of the country would have received less exploration. Toledo district is connected by the Southern highway from Belmopan to Punta Gorda (PG), which passes through some awesome Karst features around Cave branch area. After Dangriga we left the "made" highway, though there is a large road-building project underway to connect Toledo to the rest of the country. PG is the district town, set on the coast. It does have some ferry connections and an airport but most travel is by road. Being the main town it's shops sell most things that it is possible to obtain in Belize. From here it is a further hour bus ride to San Pedro.

basing ourselves, lies on the river Columbia and was about an hours walk South of the smaller San Miguel on the River Rio Grande. These villages lie where the coastal plain meets the hills and the covering jungle. Both the rivers resurge from their underground journeys a short distance above the communities, with dry stream beds continuing above, through a huge area of limestone, allowing for huge potential development. On the 20th of March 2002, three cavers; Toby, John and Martin set out from Heathrow, to Boston then Miami eventually hoping to arrive in Belize. Followed two days later by Gary and Alan



FIELD AREA 1, SAN PEDRO

San Pedro spreads over a considerable area at the western edge of the coastal planes, that have been cleared of jungle. Each family plot, has a water supply and often a selection of buildings, a mixture of concrete 'hurricane proof' and traditional wooden thatched houses, we were lucky enough to live backing on to the river for washing or cooling off. Many of the inhabitants have small farms in the surrounding area to help feed their families, these backup income from jobs with lumber companies, small shops and bars. The jungle has been largely cleared from the flat lands around the village but is soon reached in the local hills, it is crossed by many trails mainly made by hunters.

Expedition Log

Log entries by Alan Braybrooke unless credited otherwise.



Wednesday 20th March

Team 1

05.00 the alarm goes off in my ear, but I'm already awake, feeling a bit apprehensive but good. Unpack my rucksack then repack just to make double sure I have everything, dingy, cooker, underwear, etc. Paula drops me at Neath station, clamber on to the train with my Mobile house on my back and journey to Bridgend to meet John Roe, then both drive to Cardiff, pick up Martin Hoff and off to Heathrow. Still don't feel excited. John & Martin seated together, I'm near the front seated next to the window. Leave Heathrow at 18.00 and arrive at Boston at 20.35 same evening - fast! Boston is very cold, it's been snowing heavily but now rains. Spent night in crummy airport corridor, cold & draughty. Flight is at 06.00 tomorrow. Toby

Thursday 21st March

Team 1

04.00 Check in. Fly down to Miami. 5hrs and no Breakfast on flight. When we land we only have 30mins so a quick burger meal at Burger king then check-in. A stunning flight down to Belize over the Cayes, they are Caribbean Islands with lovely turquoise sea and golden sand - pity we can't play. First Impression at the airport is a hot sunny Caribbean retreat, but once in Belize City its very much a rundown poor town. Stayed at the Seaside Guest House, friendly and clean. Group of 4 German women moaning about everything there, manage to stay out of their way. John and I go out to look down Town. Look for postcard to send home. Temperature hot so John and I go for

a drink at the waterside bar. Its now 16.30, back home its 22.30. I'm really tired but very hungry, back to Hotel then out for Chinese meal. In bed by 19.00hrs. Toby

Friday 22nd March

Team 1

05.15 and I'm losing track of time. Torrential rain, get up and shower, breakfast of toast, jam coffee. Walk to the bus depot, 1 mile, back breaking. 2 hour bus ride to Belmopan, the capital. We have to stop and visit Rene Torres and George Thompson for a permit to visit the area and enter the caves. Call in to the Forestry Dept, get their permission and then back to George, yes we can go. Catch bus down to Punta Gorda in the south of the Country. 8hrs on a bus through the



jungle on plastic sweaty seats, John and Martin in seats A37-A38 me at the front on A1 with all the locals. Good journey, many people on and off. I'm lucky I had a local man pointing out waterfalls, lagoons, telling me about the villages, Orange plantations, etc. I also get 2 small girls about 9yrs old asking me where I'm from, where I'm going, what I'm doing? Then trying to sell me a basket, fair enough but did not buy. Arrive Punta Gorda 19.30hrs dropped at the hotel - Natures Way, cheap and very basic but on the sea front. Down town for food, rice and fish, bed by 22.00. Toby

Saturday 23rd March

Team 1

05.00 Early awake, back home 11.00. Down to veranda for coffee with Chad, the American owner. Half an hour later two more arrive, they work for the Peace Corps. Head down town at 7.30, town's in full swing, it's market day, wander around & pick up post cards, bit of a lazy day getting use to the heat. Toby

Team 2

Awoke in the back of my car minus dinner jacket and mobile phone following disastrous university ball, managed to find my way home to fling final items into rucksack before Gary collected me exactly on time, settling in on his back seat to enjoy my trans Atlantic hangover, stretching from Port Talbot to Boston.

Sunday 24th March

Team 1

05.15 Early awake again. Down to the veranda again, drink coffee then we are invited out of town to a reservation where they help the Mayans to support themselves, and to become self sufficient.

John & Martin go for a swim, I take a dip but then notice what all the brown floating mud like deposits are and leave.

Alan & Gary turn up at 21.30. I'm in bed - John and Martin are in the Pub. Toby

Team 2:

Very early start but not early enough to beat large queues at check-in desk. Due to very poor home repairs on hiking boots, glue all over them, I was hauled in by US customs as a potential shoe bomber. Eventually after routing through Miami both my boots and me made it to Belize, travelling into the city with a huge grin.

Straight to the bus station in Belize city to begin the journey to try to meet with the first team, had to pay a beggar who performed eye watering contortions for us, but when another, also very drunk, appeared with paraffin and torches to be juggled we swiftly mounted the nearest bus, for our own safety. The long and dusty journey rolled under us and we soaked up the views before trying to sleep, arriving late, hungry and tired in Punta Gorda,

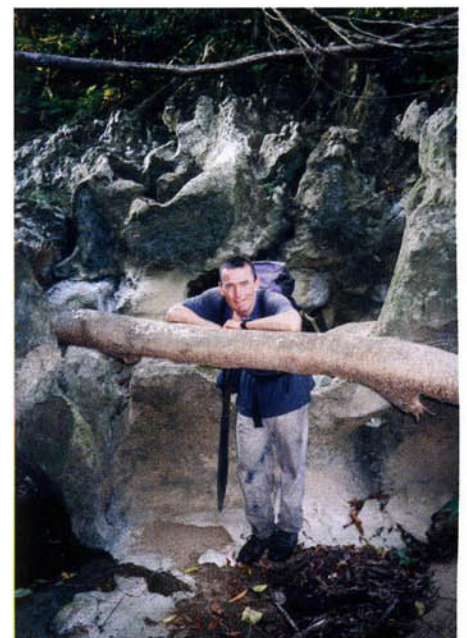
vaguely aware of meeting Team 1, exactly as planned, before collapsing to quality sleep.

Monday 25th March

Team 1

05.30 Awake, down to coffee on the veranda, out onto sea front to take a brilliant picture of the sun rising through the beams of a fishing boat, John also down here and talking to one of the locals. 06.00 Martin, Alan and Gary join us. 08.00ish down town, spicy café for breakfast, eggs, beans, toast and lots of coffee.

09.30 Back to hotel to pack gear, shower, shave etc. Down to the plaza for the bus at 11.00, though it does not come until 12.00. One and a half hour bus journey to San Pedro Columbia. Meet the family - Mum, Dad, 5 daughters & 3 sons, 1 of the boys is 15, all the others are below the age of 8. Settle in, then off for a walk to gently settle us in. This village is just as you imagine a large Jungle community to look - thatched roofs, huts, pigs, children, then the Captain takes us off for a little stroll, temperature is 34.5, no wind, overhead sun and its bloody hot! To start we are on a good track but our leader can not remember the correct way down to the river. Thinking we're right we plunge off down a dry river bed, where its even hotter!!! The river bed is full of bushes and trees with 2" long thorns. One stab and you'd be in PAIN. Big rocks - its no fun. At one point we have to stop and I can feel my body cooking under my skin, my internal temp must be high. After 15 mins we move on and we are all having problems in this heat. Finally we reach



the resurgence and the water is rising up into the air by a metre, so a good soak, well deserved, then an easy walk back to the Village. Pity Al could not remember this way out, but I have to take my time, the heat really hurts, stop at the shop for COKE! Back to hut and a nice wash in the river then the evening meal, Tortillas & Greens of sorts (leaves). Filter water then bed by 20.00. Goodnight.
Toby

Team 2

Awoke early as Gary managed to capsize his bed, started coffee marathon with Team 1 catching up on their news and also goes on with their numerous American friends, who seemingly met regularly at the Natures Way Guesthouse at 6.00am. Arrived promptly in the village square for the 11.00am bus and settled in for an hour of cooking as it became apparent that there was no bus until 12. The \$3 bus journey to San Pedro showed lots of evidence of the previous years hurricane and I was extremely apprehensive about what we would find.

To my surprise we were expected, an email sent in vain hope had eventually made its way and the Choco family were expecting us, welcoming us back to their home. The Hut that myself and Phil had stayed in previously had been destroyed, but we were given lodging in a new lean-to on the back of the



concrete central building, where the family had sheltered the 150mph winds. An acclimatisation walk to the Columbia resurgence gave us more insight, new buildings had appeared, old ones were at even more relaxed angles, trees were either down or stripped of foliage, the ground between them a tangle of the fallen debris and dense new growth.

The going was far harder than anticipated and all were glad to reach the coolness of the river, the resurgences were impressive due to recent rainfall.

Rooted around for a while after a swim and had a look at the airbell on the river bank behind the resurgence. No air space visible above water other than in the pot hole. Water very still. Then wandered back to village – very tired, stopping at the shop for a cold Sprite. Gary

12/13 Tortillas served with leaves before settling into hammock with the faint smell of the longdrop on the wind.

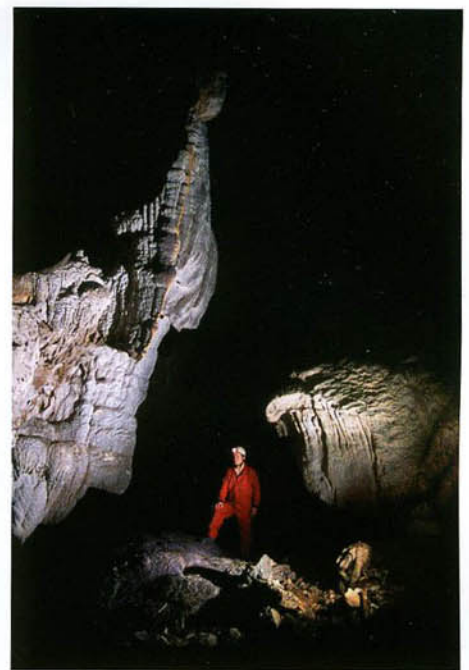
Tuesday 26th March

Bat cave, Tiger cave, San Miguel Early start, on road by 7.30 reaching the caves on good trails with only two stops, the second by a small resurgence pool, which John entered, swimming back for 6m, no noticeable flow, but lots of fish.

A swim for the whole team at the source of the Rio Grande revived spirits, before entering Bat Cave, visited previously by both the Americans and the 2001 expedition.

Al and I traversed along the left hand wall (looking in) and climbed down to the river whilst everyone else explored the right hand passages. We had no buoyancy so didn't push on into the deep water.
Gary

The whole team accompanied by Basilicus, one of the sons of our hosts, entered Tiger cave, still on awesome dimensions, no snakes, intentions to look at the logistics required to push some areas. A look at a hole found the previous year gave some promising echoes and the terminal sump that had been seen was entered, though no



airspace could be located.

Tiger cave was massive – reached via huge white limestone gorge. Big big passage and numerous open roof entrances. Went to look at lakes and decided we'd need to return with buoyancy. Continued on to 'the



connection' where Toby, Martin and Basilicus turned back. Al, John and I continued to far end of the cave through huge passages and had a look at an area called 'jump-off'. Al looked at the pitch and decided to come back with rope. Continued on to the end of the cave and to terminal sump. Al tried an exploratory free-dive attached to me and John by two long slings but could find no way on without diving equipment. We headed out, taking 50

minutes to return to the entrance. Met the rest of the Team on the beach and after a swim, a rest and some biscuits, began the hard slog back. Got very tired and was exhausted at the San Miguel shop – the heat seemed to affect me more than anyone else. After a rest, we slogged on along the road, dragging myself along and then – good fortune – managed to get a lift in the back of a pickup. A well earned cooling off in the river back at base, more yummy Tortillas and



made a plan for the next day, retiring at 9.00pm.
Gary

Wednesday 27th March

Tiger cave, San Miguel
Plan to split into two teams, one to photograph the cave, and carry inflatables - Gary, Toby, Martin + Basilicus. The second team of Al and John were to descend the hole found.

Hitching a lift on the back of a pick-up saw us arriving in good health with plenty of water, underground at 10.00am.



Before going underground, Al and I swam across the lake at the resurgence and explored the West bank. The small resurgence there had no flow and the holes we had seen provided no way on. Only one larger hole looked interesting, but would require enlarging to pass. Geared up and headed for the entrance around 10.00am. Martin and Basilicus had gone ahead to start with the photography. Al and John headed for the 'jump-off' and Martin, Toby,

Basilicus and I spent the next few hours with the photography. Slow and methodical was the order of the day. There were some problems with the flash and firefly slave, but we soldiered on and finished around 1.15pm and headed off for the lakes.

Just before leaving for the lakes, I found a side passage in the double skylight chamber and climbed up and around for more than 20 metres. This was not on the survey and appeared to have not been entered before. Finished up high in the wall of the chamber, looking down on the rest of the Team.
Gary

The pitch was dropped, through loose rocks glued by copious mud, 18m in depth, into a 20 by 25m chamber, this was part of a lower flood series, with several meandering lakes, streams and ducks.

The exploration of this area took longer than expected, though this delay ensured that the photographic team had finished inflating the dingy.

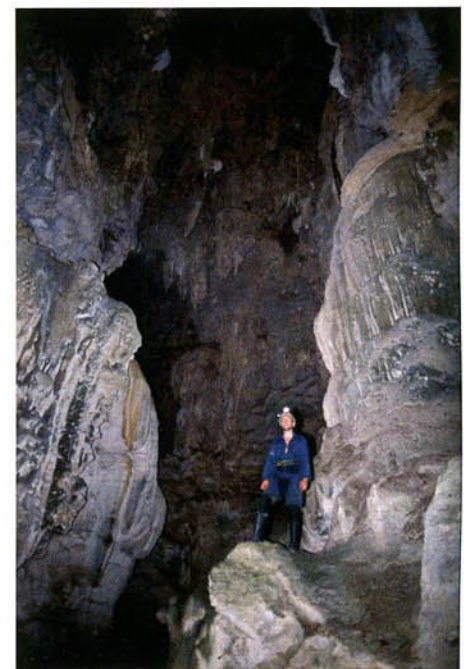
As Al and John had missed the agreed meeting time, Martin, Basilicus and I headed off



at 2.00pm to look for them. We had covered about a quarter of the cave when we met them and we all returned to the lakes.
Gary

A major event of the day was the near loss of our photographer as he plummeted from a height into the lakes while trying to capture our launch, battered and shaken he was checked and escorted out of the cave.

After discussing progress, I lowered myself into the deep water at the start of the lake and the dinghy and inner tube were passed through. John and Al got ready to join me and Martin climbed up to a rock bridge ready to photograph our maiden voyage. I was up to my chest in the water standing on



a ledge and John was in the entrance window above me.

Suddenly from above my head I heard an exclamation, then a crashing followed by a big splash. The dinghy shot down into the water and I realised what had happened. I threw the dinghy off into the lake just in time to see Martin resurfacing. Grabbing his arm, I hauled him out and passing his camera up to Toby helped him up the slope to where John could help.

Martin had bashed both elbows, grazed his chest up one side and under



the arm as well as banging his head resulting in a cut on the forehead. Toby and Basilicus helped Martin out of the cave, as although shaken, there seemed to be no serious injuries – other than the camera flash which remains at the bottom of the deep lake to this day Gary

Several lakes had to be crossed, some waded, others using our dingy and inner tubes until a 4m calcite dam blocked the passage, a short sump and a tight climb passed this, more swims led to the Roaring River 8m below. There was a powerful flow, sucking under edges and mushrooming elsewhere, ledges were followed as far as possible but the only way to follow this passage would be with extensive bolting.

Exited at 5.00pm and set off after Martin and Toby, all finally returning to San Pedro at 7.00pm exhausted and looking forward to an easier day. Tortillas and beans for tea.

Thursday 28th March

Lubaantum, San Pedro

Following two very constructive days which had acclimatised the team to conditions to be expected, as well as leading to some discoveries and concluding areas of interest in Tiger Cave, we were in need of a rest day. This was initially spent visiting the local ancient Mayan city of Lubaantum, the museum had been damaged so was empty, though the site was still impressive and the reduced foliage allowed some good photo opportunities.

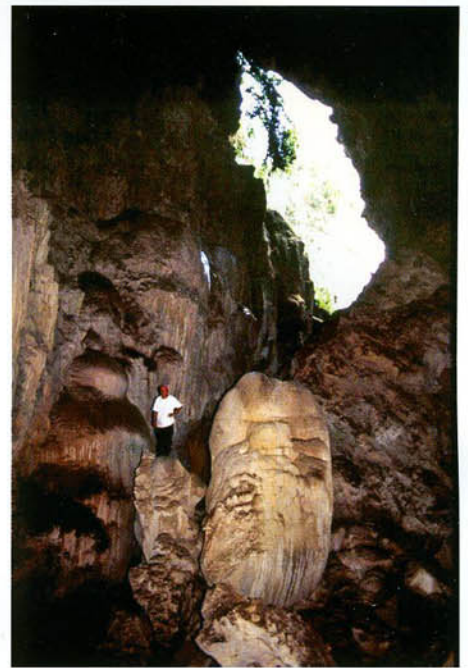
Returning through the gaggle of locals who congregate around this site to sell craft products to the handful of visitors, the rest of the afternoon was spent fixing and fettling kit. Interspersed with trips to sink into the river, the battered Martin received ongoing attention to his injuries, following his fall and he continued to give first aid to his camera.

Friday 29th March

N W Sinks, San Pedro

Plans to be guided by Ansalmo, were stopped when he remembered it was good Friday, so had to go to mass, as an alternative we had identified some sinks, heading West, just North of our location.

Using a GPS to support some unclear mapping we headed across maize fields to a col and had to break trail from there onwards. Trails were there, though had not been travelled since Iris, so required a great deal of machete work. Reaching the streambed we were to follow to the sinks, a quick bit of food was had as it was now only



1km to our destination.

Four hours later after cutting through dense new growth and wading pools we started reaching the sinks, several small muddy holes were located giving a total of about 30ft, which was choked with debris. There was some potential in the hillsides above though due to the time and the fact that we were all either low or out of water we headed home.

On reaching the dry streambed, Toby decided to wait there for us as the going looked tough and we were already tired. At 11.00am, we carried on, trying to follow the stream bed, but it was a nightmare of fallen trees and overgrowth. We had to cut our way through with the machete nearly all the time and at times had to go up onto the banks to make progress by cutting our way through the jungle undergrowth. About half way down the stream bed, I was exhausted and gave up. John went on to join Martin and Al and I sat down to try to rest. After a Muesli bar, some Glucose tablets and about 20 minutes I felt better and went on to try to catch



the others (spurred on by something large moving about in the bushes around me).

Caught them up in an area of limestone pavements and wet sections – boots and legs got soaked. Somehow now had the energy not only to carry on but had a long session hacking while the others rested – amazing how one can recover following rest and a little food. Eventually we reached a small sink that went nowhere. Al cut on in a narrowing gully and just as we were about to give up, John called from ahead and we joined him to find 3 sinks in a row. The first two were only about 2 metres deep and the third one Martin explored for about 8 metres before it choked. Gary

At 3.35 we headed out – very late and tired. After an hour we reached where Toby had been waiting, but he had already headed home (he later told us he had left at about 2.00pm). Gary

On reaching the road again, prayers were answered and pickup passed, despite getting bitten by a dog the lift was fantastic, allowing us to get back and enjoy a well-earned cold drink before black beans and Tortillas.

Saturday 30th March

North of San Pedro
Baby cried from 4.00am onwards, though fortunately it seemed not to disturb anyone else in the village apart

from us.
Talk with the family the previous night



had mentioned a cave in the farmland North of the village, learning from the previous day we ensured we were thoroughly hydrated before leaving. Talked to several farmers as we walked, none of which had heard of any cave, though there were repeated references to Esperanza camp, but that the trails were not open. Eventually heading for a recently cleared hill we surveyed the local terrain, which did not inspire any hope, instead we headed back to Lubaantum to speak with the curator, who had not



been there on our earlier visit. A wall of heat hit us as we stepped back onto the white dust of the road.

A long meandering chat was had with the curator, though he knew of nothing of direct use he did give us some others in the village that could help us. Having only earned small cokes today we retreated to the river to wash our clothes, a good evening followed. Rice instead of Tortillas for dinner and then to find a cake in my rucksack, which we had to celebrate Toby's birthday made the evening complete. The night continued with the chase to catch and remove a huge spider, that no one felt comfortable about sleeping with, for fear of being eaten, and removal of first tic of the expedition.

Easter Sunday 31st March

Columbia river, San Pedro
We had planned an early start, though this proved not early enough as our wake up call today was one of the sons of the house being taught how to slaughter pigs for the BBQ later, he proved not to have a great talent for the task. He later told us all about it, going into detail especially with Gary who as a vegetarian greatly appreciated this. This early start allowed a cool start to the day, when we reached the resurgence of the river the group split in two, with Toby, John and myself pushing up the dry bed to new ground, with Martin and Gary carefully rechecking last years ground. Still full of potential, though nothing was found despite our best efforts, climbing up hard routes with scary descents on the valley walls over rotten logs and loose rock. Back to join the family celebration and a feast with potatoes, spent the rest of the day chewing over the gristly chunks of pig we were presented with.

Monday 1st April

Columbia river, higher, San Pedro
Hysteria swept the team, sleep had been very disturbed by dogs chickens etc, but tonight was particularly bad. Ryan, the baby, managed to wail endlessly till almost dawn when he could rest as a stereo started up. Very tired but off with Ansalmo to visit the upper Columbia and some caves in that area, no bread in the shop so biscuits for breakfast/lunch. The route passed close to the deep shafts visited last year, on reaching the river bed at 9.00am, we were told of another large cave another hour along the trail,

though at present it would be over 4 hours.

The cave we were led to was up on the rivers bank, a large entrance, which contained a blind pit, but past this we entered a higher level of tubes. Full of wildlife, many bats, many flying into our faces and also various insects such as large whip scorpions - a very unpleasant looking beast.

Continuing down to the resurgence we passed some huge overhanging cliffs complete with large stal, the temperatures topped 420C. The fee of \$35Bz was felt to be steep, even by one of the sons of the family who accompanied us. Back onto tortillas for dinner.



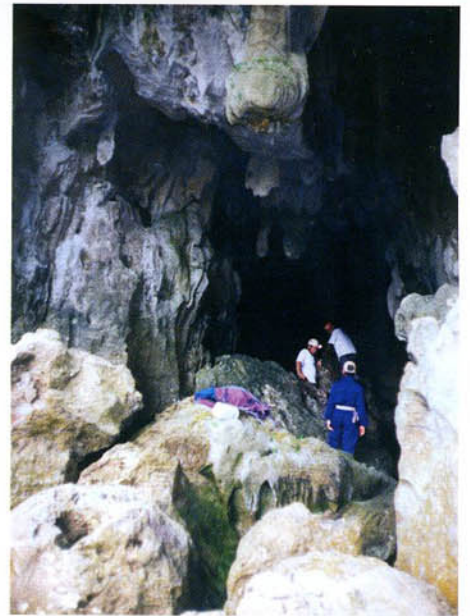
were no caves on their cleared land, it also appeared that we had left the limestone and got onto some shale's. To avoid crossing back across the first, scary, set of farmland, we set off down stream for the direct route back to the village. An idea of the support

and affection shown for me by the team was demonstrated as the river became deeper and rucksacks needed to be carried overhead.

Leading the way I suddenly found myself in water over 7ft deep, firmly on the bottom and unwilling to get my pack wet I tried to walk backwards, waiting for a helping hand. Eventually lungs forced

abandoning the rucksack, on surfacing I found my rescuers helpless with laughter at my peril. Though I was glad to see they were equally caring for all as they later stood watching John, the shortest member of the team, floundering through deep water a rucksack in one hand and unsure which stroke to use that would not result in injuries from the machete in the other.

This was the last night for three members of the team who with real jobs needed to return home, after paying up with Cesario (\$800Bz) we were presented with gifts made by his wife for us. Less gratefully received was the final meal of Tamales, into which must have been put a whole tin of



blandness powder, usually rationed into the Tortillas, the longdrop was busy that night and the three were not sorry to leave.

Wednesday 3rd April

Rest day, San Pedro

Team 1

The departure of Gary, Martin and Toby at 5.30am allowed John and myself a lie in , they would be enjoying a large meal tonight after all.

Spent the day wandering the village, following up leads about the best people to talk to, Eventually after much walking and sunburn this paid off. The village guide, whose name neither John or myself can remember, was eventually located but the only place he was keen to take us was Tiger cave, though he did have a vehicle. Victoriano (Victor) Choco had been involved with logging in the area, he had maps, which were better than ours, though he couldn't read them, telling of cave with many lakes and climbs, an other where a great wind blows out from. Unfortunately he is working at

Tuesday 2nd April

Uxbenton, San Pedro

This the last day for three members, we planned to visit a Maya site North of the Columbia, the Maya believed the caves to be the entrance to their underworld often building close to them.

Planned to use good trails South of the river then ford it, this took us into an unmarked and previously unseen farm. Here we were led to the river, but nerves increased as we were led further from the road passing hidden poly-tunnels.

On the other side of the river we found a community of Americans who allowed us access to the site of the ruins, though confirmed there



present to support a rapidly growing family.

Alfonso Chi, who has worked with archaeologists in the past was out at his farm and unavailable. Instead a feast of corned beef followed, then an afternoon sat in the river, having



a shave and watching a black stork fishing on the opposite bank.

Team 2

Up at 4.45 am after a reasonable night, though the bed was hard again as the thermorest had been packed away the previous evening.

Washed and finished packing and waited for the bus. At 5.15am we decided to head out and found the bus waiting at the top of the road. The ride to 'The Dump' was fairly quick and we got there at 5.45am.

Had an apple and some Pringles for breakfast. The bus didn't arrive until 6.30am, it was full and we had to stand. Toby got a seat after 10 minutes and then Martin after an hour. Then I finally got a seat after an hour and a half – just in time as I was ready to fall over in my food deprived condition. It was really hard trying to stand still for so long packed tightly with a load of kids whilst travelling over what can only be described as 'mile after mile of rocky dirt track'.

Had breaks from the travelling at Dangriga and Belmopan of 10 minutes each and got into Belize City at around

10.00pm.

Taxi to Seaside Guest House cost \$6Bz. Got rooms sorted and then after a nap Toby and I went for a walk leaving Martin at the Guest house catching up on e-mails.

The Belize City South Side was quite rough and intimidating, but the North side was better and the Cayes Jetty was amazing – giving a real false impression of the 'Caribbean' Belize. Loads of Americans trying too hard to be beautiful or just way to big. Back at the Guest House at 4.00pm for tidy up and diary writing.

After a few hours of resting and reading, we went out for food at 6.45pm. The Chinese restaurant was only 100 yards down the road, which was good news as the guide book recommends staying in at night. Vegetable Chow Mein and a Large Sprite – luxury – first decent meal in 2 weeks. Didn't touch the sides and could have eaten it twice.

Back to the guest house going to bed around 9.30am ready for our 4.50pm flight the next day – aiming to arrive in London on the Friday.

Gary

Thursday 4th April

Esperanza camp trail and descent of the Rio Grande

Up and out by 4.15am, this alpine start was to make the most of the cool conditions, Basilicus was supposed to accompany us, we had a big day planned and thought the locals were more likely to rescue one of their own, unfortunately he decided to stay in bed.

Under a good moon we made excellent progress. After an hour and a half we came upon a crag at the side of the track we were on which was riddled with holes, here it appeared was a major Gibnut hunting site, judging by the ropes to holes and number of shotgun cartridges. A fuller inspection was planned for later, though this was never done, as we still wanted to get miles covered before the sun came up.

We continued until the end of the loggers trail, copied from Victors map, up to this point 4wd access would have been easy and at 8.30 we had breakfast. From this point onwards the trail had not been cleared, we started off but



were repulsed, not by thick growth, instead by huge spiders, almost hand sized and vividly coloured, these built webs that were surprisingly strong across trails. There they sat in the centre of the web, often at face height, almost invisible, several near collisions later, we were walking with machete held vertically in front as if on parade, before losing nerve and retreating. Some side trails were investigated, though often leading to a selectively felled tree or blocked by our arachnid friends.

We then returned to the Rio Grande Bridge, where we decided to attempt to journey to Tiger cave and take in some of the reported American discoveries on the way, only 6km to Tiger cave. This river bed did not provide easy travel at all, the most enormous 'strainers', great dams of fallen trees,



had to be passed by precarious balance or desperate squeezing, more evidence of the hurricane?

Between the dams we made good progress, so over lunch it decided to rain briefly to ensure these rocks became good and slippery.

By 3.00pm things were not as expected, it now appeared that we were heading upstream, though the GPS and other map features confirmed our position, the river eventually petered out less than 1km from Tiger cave. On to our last drops of water and night imminent we turned back, unfortunately for the fish and tadpoles in a puddle left in the riverbed, we had a filter and managed to pump enough to get us back on our legs and back to the road for dusk. The walk back in darkness was added to by the quantities of fireflies around, disorientating or pretending to be the village that we were hoping to see. Our large cokes were well earned as we collapsed in a dirty heap outside the



village shop, we later calculated that we had covered about 40km - a distance that I had thought impossible in the climate.

Our footsore return coincided with a call from an English inhabitant of the village we had spoken to, requiring some house sitters. A quick look at his new home, with toilet, kitchen and no wailing children convinced us. Back to the Choco's for a quick swim then tea, rice and salsa, no tortillas.

Friday 5th April Rest day, San Pedro Children banging rocks together inches from my head indicated time to relocate to Rob + Marta's, one of the

first on the PG road. The day was spent eating as many meals as possible with cups of tea in between.

No one could be found to guide us to any of the talked about caves, the only person who could be persuaded was Basilicus who said he had heard of one upstream of the Rio Grande Bridge, so this was planned for Sunday.

Saturday 6th April

Upstream of Tiger Cave, Rio Grande Curious about the apparent mismatch between our map, the Americans reports and our own experience found on the journey down the Rio Grande on Thursday, we set out to connect from Tiger Cave upwards.

A full day of rest with plentiful food left us feeling back on form, making it to Tiger Pool in an hour and a half.

From here on the speed stopped, a ladder seen the previous year led to a continuation of the gorge, but no one had been that way since the hurricane, even with balancing along fallen tree trunks to make progress, in 2 hours we had only got about 300m, getting back to the start in minutes. We then went into Tiger Cave to GPS locate some of the other entrances, these proved to

be under 200m from our far point on our descent on Thursday, though with the fallen trees and new growth they were invisible from only a few metres away.

Had forgotten how large the final chamber and exit was, having visited it the previous year, though we saw a lot of it as we tried to remember which hole in the



floor we had climbed through to get there.

Returned to the village where I helped Cesario set out the new footings for what he intends to be his guesthouse, the quality of my surveying skill will be apparent to future visitors.

Sunday 7th April

Upstream of Rio Grande Bridge The porridge we had for breakfast tasted fantastic, an indicator of how bland our diet had become. It was a fine blue day so applied copious quantities of sun cream before we set out at a blistering pace, the cream then spent the whole journey relocating itself to my eyes. The terrain upstream of the bridge was far easier going, less of the huge dams encountered previously, instead mainly dry boulder streambed. The cave was supposed to be a 45min walk, but we had seen no trace after an hour and a half, John and Basilicus continued to set a GPS high point at an obvious hill. We were surrounded by very promising



looking hills but our experience over the previous days had shown us that we could easily walk within 5m of an entrance and miss it under the tangle of fallen trees. One small tight entrance was found giving 20m of unpleasant passage.

We had now become very demoralised by the effect of the hurricane and were feeling that we were expending huge amounts of energy and getting nothing

to show for it, we decided to have another rest day and try to make some new plans.

Monday 8th April

Rest day, San Pedro

Another easy day, managing six meals each and firmed up plans to move to Blue Creek tomorrow, an area that is mentioned in guide books as being known for its caves.

FIELD AREA 2, BLUE CREEK

Blue Creek is a far smaller village set along the road as it crosses the river, two small stores a school and a tourist lodge as well as a couple of dozen homes.

Tuesday 9th April

Blue Creek

The Choco's had got up early leaving only a handful of children to see us off as we set about hitching.

Our first hitch was in an extremely fast pickup driven by Mr Christopher, one of the Americans living up near Uxbenton. I had a constructive journey and found out a lot from him. He had spent some time in the Esperanza area, telling us of a good location half way along the route. While I was chatting, John was hanging on in the back of the pickup, in fear for his life as we skidded round bends and bouncing along the unmade roads.

Our third hitch was kind enough to take us straight through Blue Creek before we realised, leaving us to haul packs back in the midday sun. Searching for accommodation initially looked hopeless, though the offers soon started flowing, each only a slight improvement on the last. Luck went our way as we met Sylvano Sho, a local caver who had only recently accommodated another group from the UK, so we set up in his guest hut and kitchen. This had also been hit hard by the hurricane, now consisting of a frame covered by a US Aid tarpaulin and lacking in walls but allowing 2700 views of the road, huge potential for gringo watching.

With this sorted we set off for the caves, a chat with the keeper of the Jungle lodge, tourist accommodation, where we paid our registration fees to allow caving.

The Blue creek cave was monstrous, a great tall entrance with a river emerging from it, Dan yr Ogof

multiplied by ten, at least.

We decided to check out the river level first as we had our inner tubes with us and fancied cooling off. Our journey involved two hours of swimming, until hands went too rubbery to continue.

On the way we had to climb past large waterfalls, where the river is sucked through a tiny hole, that we were careful to avoid, through low sections with barely airspace and plenty of evidence of flood debris high in the passage roof.

Once out it was only a 15min walk back to camp, the way it should be. We were taken up the hill behind Sylvano's home, which had a view right across the coastal plane, though none of the wildlife he had hoped, was around. Little food could be got for dinner, though we did get a fish Sylvano caught with the help of our caving lights, before the complicated task of getting into a hammock whilst in a mosquito net.

Wednesday 10th April

Blue Creek Cave

Went into dry cave above the river today, this apparently leads to Guatemala, which according to locals, many of who never enter the caves, is not an uncommon trait irrespective of their location.

We explored much of the dry cave available, though there were some

Eventually we had to move out of our adopted residence and returned to the Choco's to pack for tomorrow's move. I think this pack may have been even more popular a spectacle than when the other three left, or perhaps word had got out. There was not a doorway or window that was not occupied to watch the Gringos, Mrs Choco even had to get a chair in our room.

The last three nights had made me soft and the cockroaches woke me as they ran over me while I slept on Martins bloodstained bed, causing me to return to the hammock.

obstacles we could not pass, pitches and lakes, it was fine caving, with good formations.

Food was still very difficult to get in the village and dinner consisted of Spam on biscuits.

Thursday 11th April

Blue Creek Cave

Food was becoming a big problem, only muesli bars from emergency rations could be found for breakfast, though it was very civilised being able to kit up for caving at camp. Our intention was to find a trip that would take us through the hill, described to us by Sylvano, though he had too bad a head to cave today. We wandered extensively through the dry series though not past yesterday's obstacles, though I was now struggling, feeling pretty weak and run down, leading to several small falls.

We left to sit on the end of the pier at the resort drinking cokes and eating what was left of our emergency food, the sight of two emaciated cavers sat in their pants may just have marred the



trip of the two Canadians who passed us.

With this the last day we spent the afternoon washing kit, though torrential rain prevented much drying, we also threw away as much as possible but found a good deal that could be donated to Sylvano for allowing us to stay, John was required to trade his pan grabs for a necklace with Sylvano's wife. We had exhausted rations with corned beef on biscuits for lunch, with nothing else in the shops, we were extremely grateful of the meal of rice and squash provided for us by the family.

Friday 12th April

Blue Creek to Belize city
Very cold night, no problem in getting up for the 4.00am bus, though we then waited till 5.06am, a little concerned that I have not found the flat tarantula that terrorised us yesterday, I think it has stowed away in my pack. Arrived in Belmopan at 11.00am, well ahead of schedule, our intention of paying a courtesy visit to the consulate

was almost prevented by a very keen security guard, do not ever try to visit here if you are foolish enough to lose your papers.

Our main aim of visiting Rene, our contact in the dept of Archaeology was foiled by his absence today, so instead we ate dodgy food from a dodgy market restaurant and it tasted fantastic, we had forgotten what flavour was like. Returning to Belize City we received no hassle from the beggars, who save their attention for paler and cleaner looking folk.

The afternoon was spent in our continued mission to try and regain weight, building up to a huge Chinese in the evening, then proper beds.

Saturday 13th April

Belize City to Dallas FW
Flight not till after lunch so wandered through town, discovered that Belize has a huge flag tax, £20 for a handkerchief up to £180 for a full size, so I spent my money on rum instead. It was overcast as we took off but the

clouds did clear for us to get a last look at the city, which would have fitted into the car parks at Dallas. Having put up with another drinks only flight in our ravenous condition I wanted only to eat some good fatty American food - had a special burger fund saved up as well. To our dismay we ended up in an empty terminal building with no facilities beyond metal seats, so we settled in to watch the cleaner work from one end to the other and count the minutes, too cold to sleep.

Sunday 14th April

Dallas FW to UK
We were the first to check in at 4.00am, passing the gates to an area still without food, until 5.30 at least, though it did now have cushions on its seats. For some reason they had decided to seat us apart on the return flights, which was not a serious problem, conversation having run short days before, though being in the middle of blocks of seats didn't cheer us. After managing to grab a burger whilst running through Chicago airport on a changeover I cheered and settled into my seat to sleep home, only slightly aware of the sound of wailing children seated near to John.

Acknowledgements

Welsh Sport Council. For all the financial assistance received.

Glan Afon Comprehensive, Port Talbot. For giving me the extra time off and allowing me to return emaciated and exhausted.

The Choco family, San Pedro. For accommodation, making us feel at home, especially to Basilicus for all his enthusiasm and good company.

Rob and Marta. For providing a much needed respite, almost a holiday.

Sylvano Sho and family, Blue Creek. For the use of the house and all the information concerning caves, the Maya and wildlife

Also to Bernard Szukalski, Peter Bosted and Percy Docherty for providing information regarding the explorations undertaken around Tiger cave, by their US teams and allowing us to use their material.



“One of the most satisfying things in a normal working life is to be part of a successful and innovative team. Links are forged and strengthened by people solving problems together and appreciating each other’s contribution to the process.” - P. Drucker

Drucker is an international management consultant and I believe that his comments on innovation in business apply equally to caving.

So it was when I joined the club in 1953. Harvey and Nixon had found the entrance to Ffynnon Ddu 1, Raillton, Little and others were surveying and finding new passage nearly every weekend.

The extension to Pant Mawr and Tunnel Cave came soon after.

This was a golden age of caving. I believe that we are on the verge of another such age.

Why?

We have a host of new keen members and the resistivity equipment will show us where to dig. This equipment has been built by many members over a period of years and recently given a new lease of life by Bill Buxton who has rewritten software and recommissioned the equipment.

A number of projects are planned and some are underway. We now need a dig champion or manager for each new prospect identified by Bill.

The first project is with Tony Baker at the top of the Dan yr Ogof dry valley. The next is Cwm Dwr 3 where Alan Richardson has taken a leading role - he has contributed a new laptop and negotiated permission to dig from CCW. He will probably be looking for helpers soon.

Two other sites behind the club will probably be next on the list. The first is just beyond the gate at the Engine House. Simon Amatt has indicated an interest if the resistivity confirms the density results and geological facts.

The second is just through the gate to the reserve and is marked by a lonely tree on the left hand track. Dowsing and other factors make it worth a resistivity trial.

Simon Lacey could be persuaded to manage this if resistivity results are good.

Next we plan to move to the Lloughor and need to first build a team to do the resistivity and then take on the digging.

Rhys Williams and Jon Jones have done a considerable amount of digging in this area, as has Tony Donovan.

We will need a big team to do the survey and then attract diggers.

There is so much potential and it’s up to us all to cash in on it.

Clive Jones

RESISTIVITY PROJECTS PROMISE GREAT THINGS BENEATH OUR FEET



ZLATKO REMEMBERED



Zlatko on Biokovo mountain, September 2003

Dear President, dear members of The South Wales Caving Club,

Your Newsheet No.1 and announcement for the Annual General Meeting came recently. Zlatko and I have always enjoyed reading materials that you have been sending for so many years. At these and many other occasions memories have been coming back and Zlatko would recall precious moments that he was cherishing from



Visit in August 1981

the time way back when you were caving together.

Unfortunately, on January 20 Zlatko passed away from the brain tumour. It was so suddenly and unexpected. At the end of this semester Zlatko would be retired from his teaching at the University, what would give him more time for things that for the last years he did not have time for. One of his "projects" was to visit Wales again and spend some time with old friends and make new ones. Since he was such a nice and warm person it would be easy,

wouldn't it? I was also looking forward to meeting you. I still remember the nice time that we spent with Elsie, Bill and Laurie visiting us here in Croatia and trip we made to Plaski and Balinka in August 1981, and instead of caving did some climbing on the Klek mountain. I am attaching some photos from that trip.

Going through Zlatko's papers from the time way back I found your letter from 1965 written on the occasion of electing him an Honourary Life Member. I am copying it for this occasion because it is so warm and friendly instead being just official:

"The members of South Wales Caving Club have expressed a wish to record their appreciation of the stimulating effect of the association which the Club has enjoyed with yourself, and the Croatian Speleological Society. The enthusiasm which you passed on to many members has in turn stimulated other members of Club who may not have met you personally. Your modest claims cannot conceal the qualities of leadership, and courage which has carried you down many potholes, and you have achieved a record of which we were envious.

The Club has elected you an Honourary Life Member in recognition of these qualities, and our members are looking forward to welcoming you to your Club on your proposed visit to this country.

Yours faithfully,
J. V. Osborne
Hon Secretary SWCC."

The warmth expressed in the letter and the content of it show how well you knew Zlatko and how deep your friendship was. I know that Zlatko would be happy if established contacts go on, so following Zlatko's idea that I am recommending his younger colleague Neven Bočić to replace him as a contact person, and I hope that in him you will get a new friend and caving companion and the possibility to continue and establish even deeper contacts



Visit in August 1981

with Croatian speleological Association.

Neven is a member of Speleological society Karlovac and Croatian speleological association (CSA caving since 1987). He is also a CSA instructor of speleology and has participated in many explorations of caves and pits such as Lukina jama (1392 m; 10th deepest cave in the world) and world known karst phenomena - Red Lake. He was also member of few expeditions in Spain (Picos de Europa), Mexico (Chiapas) and Romania (Bihor). Neven works as university assistant for geomorphology on Department of Geography, Faculty of Science in Zagreb with special interests on karst geomorphology and speleomorphology.

I wish you a succesful and joyful meeting and hope that we shall stay in touch. I am looking forward to hearing from you,
Sincerely yours
Valerija Pepeonik
valerija.kelemen-pepeonik@zagreb.hr



Visit in August 1981



ACROSS

- 2 Up the M1 to the end of Dan yr Ogof
- 6 Kent place running a showcave
- 8 Orbiting Earth is a long way to go to get a pint of cow juice in OFD
- 9 As 9 across but now we're on a downer
- 12 We are all members of this blue flashing lights group
- 13 Cumulus in Dan yr Ogof just before The Green Canal
- 15 Early in the fifth month dances around it's inlet.
- 17 Pristine area of Penwyllt with not a spoon unwashed and every cooker gleaming
- 18 Try to sing a note on the cave's sheer drop
- 21 Remains of a tree is in need of repair across the way
- 23 To lead in the past, shining new technology
- 24 More brown when crossed and with no barges in this stretch of water in Dan yr Ogof 2
- 25 Getting down a rope faster than the ascent
- 26 Favourite for gardening, fishing or caving

DOWN

- 1 Ancient bacon was miner's lights adopted by cavers
- 3 Doctor Who's Tardis in Daren Cilau
- 4 Ian Alderman's old Escort car similar to firework in 22 down
- 5 This welsh mountain of caves is not the whitest
- 7 Crisp maker's gun cupboard
- 9 Six beginners from Stalag11 found calcium carbonate on the up underground
- 10 SWCC publication now better than ever!
- 11 Undersuit which also describes many male caver's faces
- 14 A Clanger's favourite at Penwyllt parties.
- 16 Referring to some old caver as passage abandoned by water
- 19 Smelly light banned on OFD
- 20 Four were crossed to 1937 series
- 22 Big noise to shift boulders



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