South Wales Caving Club

Clwb Ogofeydd Deheudir Cymru

Newsletter 136 October 2019

Front Cover Photograph

Ogof Ffynnon Ddu Streamway
At Marble Showers
Mark Burkey

Inside Back Cover Photograph

Jules Carter in Gouffre des Ordons, Jura, France
Tony Baker

Back Cover Photograph

Charterhouse Cave, Somerset
Sanita Lustika

Gary Vaughan in the Grotte Baudin, Jura, France.
Photograph: Tony Baker

SWCC Newsletter 136
October 2019

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Editorial

Bob and I are delighted to present Newsletter 136 and apologise for the hiccup in our production schedule. We very much appreciate the effort many people went to in meeting our original deadline and regret that our circumstances delayed the final publication.

This December sees the fortieth anniversary of the sad loss of two lives as a result of flooding in Ogof Ffynnon Ddu. As well as being a time for us all to reflect on the consequences of that accident for the friends and families of John Fitton and David Gough, it is also right to note that three other cavers in their party were fortunate enough to survive. Two of them, John Absolom and Richard Jones, are still members of our club. Despite the passing of the years, little has changed to make caving in the OFD streamway any safer. In fact, it is possible that a whole new generation of cavers has emerged who are unfamiliar with the details of this tragic but historic event and may be unfamiliar with 'streamway lore' as we understood it then. It is also entirely possible that climate change may be creating conditions favouring unprecedented rates of rainfall with the inevitable implications for flooding in caves. So, for these and other reasons, it seemed appropriate to feature this aspect of Ogof Ffynnon Ddu in Newsletter 136.

In addition to a well reported return trip to the Jura, our members have roamed more widely too, and we bring you reports from Spain, Bulgaria and even ice caves little more than 800 miles from the North Pole! We are also pleased to present a short report from two of our newer, younger members who have been exploring and adventuring in Slovenia with their university club.

As always, it is encouraging to be able to report on club exploratory work, in this case, several very determined digging projects. There is also a wonderful reflection on the 'utter joys' of becoming involved in digging and the 'enjoyable futility' of post-digging, beer-fuelled debate from David Eason!

The Club's library is an amazing resource covering all aspects of caving and to conclude this Newsletter our President, Fred Levett, reviews a new acquisition: The Double-Decker Himalayan Caving Adventure.

A huge 'thank you' to all our contributors – without you, the Newsletter could not happen. Thanks also to the following people for sourcing material, advice and assistance, photographs, etc:
Josh Bratchley (CDG), Mark Burkey, Julian Carter, Brian Clipstone, Gareth Davies, Peter Dennis, Dave Dobson, Sue Goodhead, Adrian Hall (CDG), Sanita Lustika, Paul MacKrill, Terry Moon, Sam Moore, Paddy O'Reilly, Susan O'Reilly, Jem Rowland, Carlo Ryan, Clive Westlake, Mary Wilde (BCA Librarian) and Dai Williams.
Please accept our apologies if we have missed your name from this list – any omissions are very definitely not intentional, and all assistance is greatly appreciated.

Looking forward into 2020, and on into our Club's 75th anniversary year, we are mindful of the need not to 'poach' material that might be forthcoming for a bumper anniversary publication in 2021, so are thinking that publishing a single Newsletter in the summer of next year is probably the best policy.

Elaine and Bob

Flooding in Ogof Ffynnon Ddu: A Historical Perspective

Researched and collated by Bob Hall

Ogof Ffynnon Ddu was discovered because it floods.

The original entrance, dug out in 1946 by Harvey and Nixon, was located precisely because it was known to be a spot where water would bubble out of the ground in very wet weather. That historic entrance has long-since collapsed and been replaced by the present blasted shaft, but if you walk up the 'Pant' in wet conditions you can still see water rising in some of the shallow depressions to the right of the path before you draw level with the present entrance.

As anyone who has dived in the resurgence will testify, it soon becomes very tight. This restriction at the outlet to the cave causes water to back up in flood, sometimes as far as the entrance chamber, right to the bottom of the iron ladders as Sam Moore describes:

> *I have, on several occasions, witnessed water close to the bottom of the ladder down into OFD 1. I have heard several other people say this, so I don't think it is particularly unusual and it probably happens several times each year. The most extreme case that I can recall was when I was unable to actually reach the bottom of the ladder without getting wet, because it was immersed in standing water. On that occasion, the arch under which you stoop as you start to move away from the ladder was sumped. Back on the surface, there was no evidence of water resurging in the vicinity of the original entrance, so the local folk memory which led Peter Harvey to dig there must have come from some seriously major flooding events.*
> **(Sam Moore: Previously unpublished account.)**

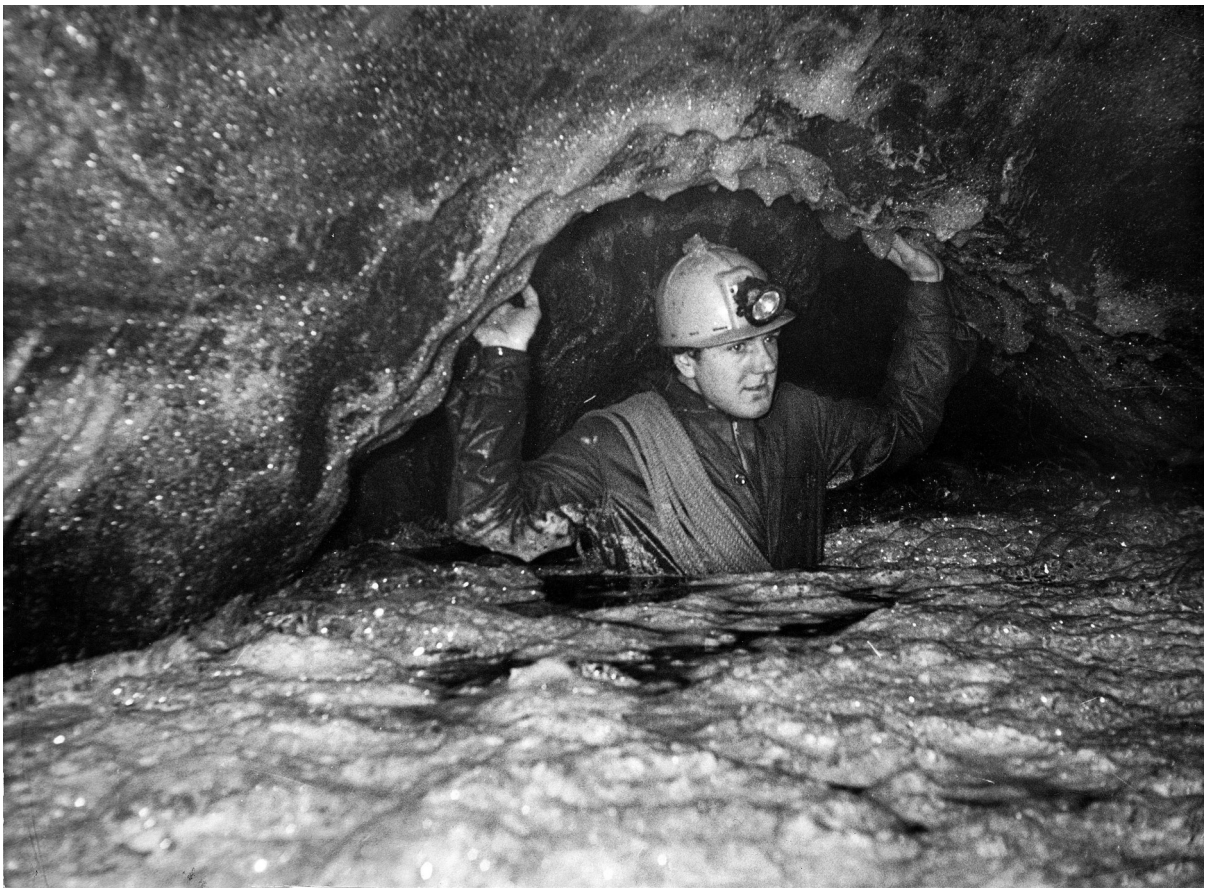


Image first published in Ogof Ffynnon Ddu monograph (O'Reilly 1969) and credited to R. Arculus. The original caption read, "Pluto's Bath in exceptional flood conditions". The caver is Terry Moon. Special thanks to Paddy O'Reilly for supplying a high-quality digital copy and to Jem Rowland for his expertise in preparing it for publication.

Two Images of 'The Step' in flood conditions.
The photograph above, taken by Paddy O'Reilly (who also features) in the late 1960s.
The photograph below, taken by Carlo Ryan after heavy rainfall in early October 2019.
It is noteworthy that the stream level is somewhere between 1m and 1.5m "at The Step" in both images.

Flooding in OFD takes many forms. There is rightly something of a focus on 'flash floods' in this Newsletter, but there can be flooding as described above, involving a relatively slow rise in general level, submerging normally dry passages. This can occur not only in the Entrance Series but also in Dip Sump Series, in the passages between the Confluence and the Divers Pitch and in OFD 3. Flooding can also be prolonged. Whilst 'flash floods' may appear rapidly and recede almost as fast, the main stream can remain impassable for days at a time, as evidenced in the historical account below.

Bill Little and Lewis Railton 1951

This incident was an important one in the history of the club and the development of cave rescue in Wales and nationally. It became part of the folklore of the club and the site of their impromptu camp near Shale Crawl in the Rawl Series was pointed out on every guided tour of OFD 1 when we had a leader system. The incident was widely reported in the national press and featured in several published books over the next decade or so. Crucially, it led to the 'engineering' of the Escape Route during the following few years. That is to say, the installation of the steel traverse cables of Bolt Traverse etc. and the blasting of the 'Dugout' as the final link to the entrance. (It is perhaps no longer general knowledge in the club that Bolt Traverse is so called because it follows on from Bolt Passage, the route that allows you to 'bolt', that is 'run away', from the Rawl Series.)

A detailed report on the incident was written by Railton and Little soon afterwards and was republished in the SWCC 50th anniversary publication (NL118, pages 26 – 28). There is no better summary than that written by Arthur Hill, Club Secretary, at the time.

> *"Everything that happened in 1951 was eclipsed by the enforced imprisonment of Lewis Railton and Bill Little in Ogof Ffynon Ddu for some 50 hours. When they entered the cave about 10.45a.m. on Saturday, 25th August, to continue survey work at the extremities of the cave* (the Rawl Series Ed.) *they did so in accordance with previous practice, intending to leave the cave the same evening. Unknown to them, rain during the day had swelled the Stream Passage and produced a full flood from the Boulder Choke, making it impossible for them to get out. No concern was felt by those outside until midday Sunday as it was known that special rations were stored in the cave for such an emergency. By this time the flood showed no sign of receding despite a temporary improvement of the weather during the morning, and the first emergency calls went out to various members of the club. The full story of this incident has been adequately covered elsewhere. It may be said that this was the Club's first emergency and that the forces which fought the flood throughout the Sunday night and Monday included all available members of the Club, Mendip Cave Rescue Squad, the Army, National Fire Service, Police, Miners' Rescue squad, R.A.F. Mountain Rescue Squad, and the Yorkshire cave Rescue Organisation party which responded but arrived after Railton and Little were released. The Yorkshire men missed the glory but rank among the heroes. Their vain journey and immediate turnabout was duty done in the highest tradition of their breed. The rescue was accomplished by a major diversion of Pwll Byfre water into the Nant Byfre surface stream (an engineering feat performed largely under foul mountain conditions) with a strong fresh team largely of Mendip C.R.O. members to reach the trapped men and inspire them to leave the cave to reach safety about 8.30 p.m. on Monday the 27th. Their hope had been that they would find improved conditions on the Tuesday morning, and they were naturally ignorant of the course of events outside the cave. It was estimated that their first chance to leave the cave would have been on the following Friday evening had not the rescue measures been taken.*
>
> *"In common with events of a similar nature tremendous publicity was given to the matter in the national Press, while locally the rights and wrongs of the case were thrashed out interminably."*
>
> **(Republished in SWCC 21st Anniversary Publication, page 15)**

Doubtless many lessons were learned at the time and I remember a dump of 'special rations' still in place in the Waterfall Series in the 1960s for just such an eventuality. (One could still be trapped there today – but there are no rations.) Otherwise the most valuable lesson for us twenty first century cavers is to note the duration of the flooding and the significance of diverting the Nant Byfre.

Press response to events in August 1951

Arthur Hill was not wrong, press coverage was considerable, perhaps in part because of the involvement of local miners and of the army. And of course the presence of Marjorie, Lewis' wife, on the surface made the story more 'newsworthy'. And extraordinarily, (for the pre-internet age) it was published across the world as several of these press-cuttings show!

TRAPPED FOR 50 HOURS IN CAVE

Two Men Rescued

From our Correspondent

SWANSEA, MONDAY.

Two men who had been trapped for two days in a Swansea Valley cave, through which ran a river swollen by recent rains, were rescued to-night.

The men—Lewis Railton (45), of Chester Road North, and William Little (31), of Wrekin Road, both of Sutton Coldfield—entered the cave, Ogof-ffynonddu, at ten o'clock on Saturday morning. The alarm was given by Mr Railton's wife when he failed to return at night. In the afternoon heavy rain had flooded the river Byfre, which runs through the cave, and the torrent had cut the men's road of escape.

Local miners volunteered to go into the cave to-day, but after they had gone in a quarter of a mile they found they were being swept off their feet by the torrent and had to abandon their attempts for a time.

To-night, when the waters had receded to something near their normal level, an appeal was made for volunteers to go down and form a human chain to pass any necessary equipment to the spot where the men might be found. About sixty local miners eventually went underground, headed by fifteen cavers, two of whom were women and five of whom were wearing frogmen's outfits.

NOT SHORT OF FOOD

Some two hours later Mr Railton came out of the cave looking little the worse for his ordeal and was followed within a few minutes by Mr Little, who looked slightly exhausted. Both men were wet and dirty. They had been trapped for more than fifty hours.

They said that they had reached a dry place when the waters rose. They were not short of food and their supplies were supplemented by supplies stored in a known place underground which included iron rations and a spirit stove on which they made coffee and cocoa. They had lights from acetylene headlamps fixed to their helmets. When they saw the water rising they passed the time by playing noughts and crosses in the sand on the floor of the cave. "It was the longest day I have ever spent in my life," said Mr Railton.

Mr Railton, who is the president of the Birmingham Cave and Crag Society, is a chartered electrical engineer in the research department of Tube Investments, Ltd. Mr Little, an engineer, usually accompanies Mr Railton, who has done research work at the Swansea Valley caves for about three years on behalf of the British Cave Research Group.

Four other men were at first thought to have been in the cave, but the Glyntawe police stated to-night that these men had been located. They had entered it on Saturday afternoon but, finding after two hours that the waters were rising rapidly, they had decided to go home.

Above and left: Guardian, 28th August 1951.

Right:
The Honolulu advertiser!
(The story seems to have been widely syndicated across the anglophone world.)

HumanChainSaves 2 Cave Explorers

ABERCRAVE, Wales, Aug. 28 (UP)—Two cave explorers, rescued by a "human chain" after being trapped by a raging underground river, said today they spent 58 hours in the "cave of the black well" playing tick-tack-toe.

Mrs. Phyllis Millward waded almost a mile through surging waters of an underground river last night to head a chain of 80 men who rescued the pair, Lewis Railton, 45, and William Little, 31, engineers and members of a cave explorers club.

Birmingham Gazette

CITY EDITION

No. 33,468 (210th year) TUESDAY, AUGUST 28, 1951. THREE HALFPENCE

TWO CAVE-MEN RESCUED

'Devil's Water' fight ends

TWO Sutton Coldfield cave explorers—wet, dirty and very tired—last night walked out of the Welsh cavern where raging flood water had imprisoned them for 57 hours.

A selection of newspaper headlines covering the successful rescue of Bill Little and Lewis Railton.
The tone and dramatic embellishments being typical of popular news reporting of that era.

CAVE MEN PRAISE RESCUERS

IN spite of the dangers experienced by the two men trapped for 58 hours by flood water in Ogof-y-Ffynnon Ddu, at Glyntawe, Swansea Valley, exploration is to continue and cavers will carry on as before.

This was stated yesterday by Mr.

Human Chain Pulls Explorers From Cavern

ABERCRAVE, Wales, Aug. 27—(AP)—A chain of 85 men pulled two explorers to safety tonight from a flooded underground Welsh cave where they had been trapped for three days. The explorers were unhurt.

Welsh Cave Traps Pair

Four Others Feared Caught Underground

RAVE, Wales (AP) — Relays of rescue workers searched huge Ogof Ffyddu Cave today for two men trapped underground by the flash flood of a subterranean river.

FEAR FOR OTHERS

There was a chance that four other men might have been caught deep in the earth with the missing pair two days ago.

Those known to be inside were Lewis Railton, 40, one of the foremost speleologists (cave research workers)—in Britain, and William Little, 30. Both are members of the Birmingham Cave and Crag Society, of which Railton is president.

The Birmingham Post, UK; ***Statesman, Salem, Oregon,*** ***Windsor Star, Ontario***

Not only did the incarceration of Bill and Lewis generate considerable press interest but it also provided material for authors for some decades after the event. This bibliography, kindly supplied by Mary Wilde, BCA Librarian, illustrates the point.

Lovelock, James. 1963 Life and Death Underground. London , G Bell and Sons ltd, pp 41-46 p56

Casteret, Norbert. 1952 (English Translation 1954). The Darkness Under The Earth. London. J.M. Dent & Sons. pp109-110

Casteret, Norbert. 1962. More Years Under The Earth London. The Scientific Book Club . P114

British Speleological Association (BSA) : Cave Science (Journal) Vol 3 No.18 (1951)

Journal National Speleological Society : NSS News Vol 9 (4-12) (1951) 12:11C. Lewis Railton; W.H.Little, Observations and Recommendations arising from personal experience of being trapped in Ogof Ffynnon Ddu, S.Wales, for 58 hours

Railton and Little 1951 The British Caver Number 22 PP68-78

Eyre, J. Frankland, John. 1988 Race Against Time. Lyon Equipment (Books) p44.

Flooding in Glyntawe, August 2nd 1954

It started raining about midday Sunday and it rained without ceasing for twenty-one hours. During the early hours of Monday, August 2nd, it was extremely heavy and from Sunday to 9 a.m. Monday 3.04 inches of rain had fallen.

At 8 a.m. the floor of the cottage was under 3 ins. of water, and the Llynfell was running merrily through the front garden. The Tawe was said to be 7 ft. above normal in some places and water flowed across the road into Tavern-y-Garreg and also in front of the church.

(The 'cottage' mentioned above is the old HQ, long since demolished, adjacent to what is now Craig y Nos country park. Ed.)

In Ogof Ffynnon Ddu John Barrows was surprised to see water flowing beneath the new entrance towards the old entrance although water was not issuing from there. Later that morning as the water subsided, he saw water coming through the Short Cut and running into Entrance Pool. For the last couple of years this pool has been silted up as the result of 'road making' in the entrance but now the sand has been washed out again.

Bill Clarke, who later lead a party into the cave, reported that froth marks were 2.5 ft. above the level of Pluto's bath. In Boulder Chamber the lower of the large blocks in the choke were washed clean and the pebble floor had altered slightly while the 'pots' beneath the Waterfall Traverse were filled.

The first Traverse was washed clean as were the floors on either side for some 4 ft. back from the Traverse wall. At the 'Step' froth marks were still left on the wall towards the Loopway some 18 ft. above normal and within a foot of having flowed through the Loopway itself.

The flood was however very much higher than that at the end of August 1951 (i.e. at the time of Bill's and Lewis' incarceration. Ed.) *but even then we did not have as much as 3 inches of rain in one night. The route from the Rawl (Bolt Passage and Bolt Traverse etc.) discovered in 1951 and 1952 made into a practicable way out in ordinary floods would probably been useless early on the Monday morning even assuming that the first Traverse was passable for Flood Passage and Entrance Passage would not have been. Pant Canol would have been a doubtful hope for a proportionate increase of flow there, if it did not bring the lake up to the roof would probably have made the squeeze in Gour Passage impossible.*

(taken from SWCC Newsletter 10, pages 4-6, W.H. Little 11/8/1954)

This extract makes it clear that not only can the streamway itself become impassable but in severe flood the entire lower part of OFD1 can become submerged, which tallies closely with Sam's account in the introduction.

Evidence of very high water levels near Pluto's Bath, early October 2019. Photograph: Carlo Ryan

Intimations of how OFD 2 might flood: July 1967

Newsletter 57 reports some observations of flooding in the lower parts of OFD 2. (At this point in the exploration of the cave, the connection from Cwm Dwr had been established a few months previously, but Top Entrance was yet to be opened.)

> *Floods. The last week of July was a very wet one and the Stream was flowing down the Flood Bypass for most of the weekend. At the height of the floods it had been 25 feet deep there! The Confluence had been flooded to a depth of 6 feet.*
>
> *The disturbing fact about the flooding is the rapidity with which it can occur. Denis Kemp's photographic trip reported that it rose visibly in a period of a few minutes.* (This was at the Confluence – Bob was on that trip – Ed.) *Another party left the Confluence on another occasion and noticed no alteration in the level of the stream, but three hours later the resurgence at Y Grithig was a raging torrent.*
>
> **(SWCC Newsletter 57, page 24)**

These Newsletter extracts relate to two trips by Paddy O'Reilly and his companions. Paddy has kindly supplied a transcript from his logbook describing these events in more detail:

> *29 &30th July 1967 - OFD 2*
>
> *"A wet weekend. Very wet. So after jawing away for many hours at a committee meeting, Susan [O'Reilly], Colin Graham and I went to look at the floods. Denis Kemp had earlier given a graphic account of a "two feet rise in five minutes". At the Boulder choke [Cwmdwr link to OFD II]…we wanted to look at an alternative route to the Smithy…..[then]…straight down to the Flood Bypass and the sound of a mighty river. There were some still pools well back towards Piccadilly and at the passage down to the sumps a raging torrent of brown water rushed past. We were intrigued to see foam flood marks fifteen feet above our heads. It took us all we could do to fight our way upstream against the current. It was magnificent though, really worth it. At the Confluence the flood marks showed that it had been six feet deep at the downstream end! The [foam] level stretched right back to the first turn of the Cwdwr stream. We spent 5 minutes or so pushing through the bedding plane arch where there was only 18" of airspace. Very exciting."*
>
> *Party: Colin Graham, Susan and Paddy O'Reilly*
>
> *Time: 1:00 am to 4:30 am*

And:

> *5 & 6th August 1967 - OFD 2*
>
> *Susan and I did a long (6:15 pm to 5:15 am) carry of food supplies in via Cwmdwr and up to the top of Maypole Inlet to make a food cache for our proposed camp at the Trident later that month. My logbook notes that:*
>
> *"We were out at about 5:15 am and it was pouring rain. So wet was it that by 8:00 am the resurgence was in full flood. Although we had found no change in water levels on our journey out, so we must have only just made it to the confluence in time!"*
>
> **(Paddy O'Reilly, personal communication September 2019.)**

Some of these observations in the Flood Bypass area mirror those of Sam Moore from a few years later:

> *"A second event also involves a trip down Cwmdwr. This one was considerably shorter, because when we reached Piccadilly and started to go down the slope towards Flood Bypass we met water a little way down, not very far beyond the high level alcove on the right. There was no noise of floodwater, just brown water swirling gently where we did not expect to find it. Looking at the data on Survex, the streamway must have backed up by something in the region of 25-30 m to reach this point. It may not be fair to do this, but transferring that depth of water into the start of the route to OFD 1 would imply that the Divers Pitch and the crawls above it were sumped and that water would be flowing downstream out of the Letterbox."*
>
> **(Unpublished account: Sam Moore)**

Rumblings in the Rocks, Booming in the Boulders: 1971 - 1972

Around this time, I caved quite often with St Albans Caving Club since I lived in that area of Hertfordshire. On one trip into OFD 1, a party of us went up the main stream in unremarkable water conditions as far as Boulder Chamber where I stopped to take some photographs whilst my three or four companions went through the choke to Dip Sump and possibly to have a look at the connection which was pretty new at that time.

Whilst I waited for my friends to return, I began to notice booming and banging noises which didn't sound like cavers, and, as these became louder and more frequent, I turned on my light to find water beginning to appear in the floor of the chamber. The penny now dropped, and I threw myself into the choke to call the others who, fortunately, were just coming through the wriggle above Hush Sump. We made a hasty retreat down Upper Flood Passage in a significant stream, less than knee deep but enough to worry us. At that stage less than an hour had elapsed since we had come up the same passage with no stream beyond the Waterfall Series' minor contribution.

We scrambled up Lowe's Chain and then decided to wait and see what happened. Within twenty to thirty minutes the water below us had risen and accelerated and was now in awe-inspiring, thundering spate, far too violent for any caver to enter and survive. The chain itself was flailing around, its weight as if nothing to the force of the water.

In little more than ninety minutes the water had risen from a trickle to become a lethal torrent. And what the main stream was like can only be imagined. A salutary lesson was learned that day.

(Unpublished account: Bob Hall.)

Another lucky escape from Boulder Chamber: 1970s

Something over four decades ago I took two teenaged girls on the through trip from Cwmdwr to OFD 1. They had been underground before and were fairly fit, but did not have a great deal of caving experience. In those days, the through trip was not considered excessive in such circumstances, although that might well now be different.

As I recall the night before and the day itself were dampish but not so much as to make it seem that the OFD 1 streamway would be impassable. It was certainly not raining when we went underground. There was not a lot of water in the Cwmdwr stream itself, but the 'Divers Pitch' climb was perhaps a bit wetter than usual. We got as far as Hush Sump without any trouble at all, but discovered that there was only about six inches of airspace at the lowest point of the boulder choke connection to Boulder Chamber. We carried on through, but as we started down towards Lowe's Chain there was quite a lot of water and when we reached the chain it was knee deep and seemed to be rising.

Carrying on down the stream was out of the question. Going back was not really an option because we would probably have found the Hush Sump connection sumped and we would quite likely have ended up spending a very uncomfortable and potentially prolonged period in Boulder Chamber - the water was rising quickly enough that coming back down to Lowe's Chain would by that time have been positively dangerous. We therefore came out via Lowe's Passage and the Escape Route and all was well that ended well. As a footnote, a fall while climbing into Lowe's Passage could have been very serious, since an injured person could well have been carried away downstream.

On returning to the surface and the HQ it was still not raining and had not rained to any great extent during the day. We didn't in those days think in terms of flood pulses, but I now think that would be a fair description.

(Unpublished Account: Sam Moore)

Two Deaths in the Ogof Ffynnon Ddu Streamway: December 1979

Often referred to as 'The Gough and Fitton incident', this tragedy occurred at a time when caving fatalities in South Wales had become depressingly frequent events and all had involved water. Two involved cave divers, several more involved inexperienced people drowning in Porth yr Ogof.
The loss of David Gough and his companion, John Fitton was different. In this case the water was not deep, nor were its victims diving or attempting to swim – they were caught in a rapidly rising, fast flowing stream.
What follows is drawn from several sources, Frank Baguley's report on the inquest and Brian Jopling's report, made first to the Coroner and later to the SWCC AGM the following spring.

Brian Jopling Reported:

On Dec. 2nd 1979 D. Gough and J. Fitton were drowned in OFD 2 stream. The rescue attempts and subsequent recovery covered 28 hours and involved some 85 cavers. Several, cavers did two or more trips into the cave. The following is an extract from the report sent to the coroner:-
The party consisted of five cavers. Three were members of SWCC. R.D. Jones, (little Richard) John Absalom and Rich Morgan. Dave Gough was a prospective member, and he and John Fitton were both members of the Mercian Mountaineering Club (Birmingham).

The three SWCC members wore full wetsuits. Gough wore a 'Polar' suit covered by a good quality 2 piece nylon oversuit. Fitton wore climbing breeches, two pullovers, a boiler suit and climbing gaiters. All had electric lamps. Gough and Fitton both had converted Oldham Nicads. Fitton carried an Ammo box with a carbide lamp, carbide, matches, candles watch and food. Gough and Fitton both wore good quality Vibram boots. Neither wore wet suit socks.

The party intended to do the Cwm Dwr to Top Entrance through trip. They entered the cave at about 12.00 and experienced no difficulty in reaching the stream, although Fitton had been rather slow in the crawl and choke due to his large stature. Upon reaching the Confluence the stream did not seem high. The weather upon entering the cave had been light to heavy drizzle and heavy mist. Gough and Fitton were told that they would be getting wet from the Confluence up and both said that they wanted to go on. After passing the First River Chamber the party noticed that the stream seemed to be rising, but all felt it was safe to continue. As the party passed through the pothole section they realised that the stream was rising faster than they had thought. Gough and Fitton began to get cold, both having been immersed in the pots. Gough in particular was beginning to suffer badly from the exertions of trying to keep out of the water. His small stature made traversing very tiring. The party decided to attempt to reach the Oxbow where they could wait out the flood and recover. After passing the big pot Absalom could not pass the cascade. Gough seemed to be suffering from exposure and Jones was also giving cause for concern. The party decided to turn back in an attempt to reach dry passage downstream.

Almost as soon as the party turned back they became separated as they were all swept away. Morgan and Absalom were swept ahead and past the pots. They managed to reach a flake and as they climbed out of the water Gough was swept past them. As they climbed down to go after him Jones was swept to them. They managed to get hold of him. Jones was in a bad way. His hands were cut and he was incoherent. No sign of Fitton was seen. Jones had to be taken out of the cave as soon as possible. Absalom and Morgan searched as well as they could on the way downstream but saw no sign of Gough. They found they could make their way downstream having passed the most difficult section, the pots, to Marble Showers, and left the stream at the Confluence, after checking the Sump. Upon reaching the crawl Absalom went ahead leaving the cave at 8.30. He arrived at the H.Q. as the first search party were about to set out.

A considerable amount more was reported about the details of the call-out, search and subsequent recovery of the bodies of the victims.

Brian Jopling's report to the inquest also stated:

A conclusion was added to the report in which we stated that there were two main causes of the accident:-

That the stream rose unpredictably and faster than normal

The victims had become tired and cold as a result of not wearing wetsuits.

Frank Baguley's notes on the Inquest

These are very comprehensive so only extracts are reported here:

The Inquest was held in the Police Court in Ystradgynlais at 2:45pm on Thursday Jan 24th 1980 having been previously adjourned, under H. M. Coroner and a jury of eight just men…….

The first witness was Dr James, the Consultant Pathologist from Singleton Hospital, Swansea……

…. He described the injuries in detail, and the internal pathological findings which led him to state that they had both died from drowning.

Several witnesses were then questioned, including Bruce Foster, who gave extensive evidence about the nature of the cave and the access arrangements and how trips are logged and call-outs initiated. The surviving members of the party, namely John Absolom, Richard Morgan and Richard Jones also gave evidence of the circumstances leading to them going underground with David Gough and John Fitton and the subsequent events in the streamway.

Martyn Farr was also called, having been one of the rescue party which discovered the bodies of the deceased. Having established the length and extent of his caving experience, amongst other matters M.F. was asked a pertinent question about the weather conditions:

Q. Would you have gone in that weekend? M.F. Yes, the River Tawe was just above normal. He did not think it was as high as it was inside or would be.

Bruce Foster was recalled to give further evidence, one interesting item from which is as follows:

A number had gone caving that day. One party had gone on the same route in the streamway and got through about half-an-hour (estimated) before the affected party. They had a rope which they used for one of the party who could not swim, to help him across the 'pots'.

B.F. Also stated:

…he had been in the streamway on other occasions when more rain had fallen with no trouble whatsoever…….. B.F. explained that what had probably happened was a 'bog-burst' which is an unpredictable event, caused by a super-saturated bog releasing its contents and causing a rapid rise in water in the streamway. (See the footnote on page 36 for further explanation of this comment.)

During the course of the inquest members of the jury had returned several times to the idea that persons underground needed to be warned of weather and stream levels on the surface. For example with John Absolom in the witness box:

Juryman:- Is there a rain gauge at Penwyllt? J.A. No.

Is there any way of recording the water entering the cave and transmitting it to the various entrances? J. A. No.

And later, with Martyn Farr giving evidence:

Foreman:- Raised the question that if there had been a system of recording and transmitting the weather conditions, rainfall etc and of warning those in the cave? M. F. Nothing could be done to help a party already in the streamway.

This preoccupation with an 'early warning system' is then reflected in what follows.

In concluding his summing up and advice to the Jury, the Coroner advised them that they had the option of adding a rider to their verdict, which should be aimed at preventing such accidents in the future.

Frank Baguley then reports:

The Jury retired at 4.25 pm and returned at 4.45 with the verdict 'Accidental Death by Drowning on Dec. 2nd 1979 in Ogof Ffynnon Ddu, Penwyllt'. They added a rider in two parts:- to be directed to the South Wales Caving Association (meaning of course 'Club'.)

That they deploy some means of communication to underground cavers regarding impending danger.

That an approved leader should accompany all parties underground.

Returning to Brian Jopling's report to the SWCC AGM,

he writes:

Both the Committee and the OFD Management Committee have considered these riders and have decided as follows:

To institute a leader system for OFD 2 would be an enormous task. The problems of testing such leaders would be almost impossible. If we confined the leadership to the mainstream only there is a danger that parties would put false information on the destination board, leading to great difficulties in the event of an accident. The access restrictions to OFD 2 already confine entrance to bona fide cavers from recognised clubs.

It is impossible to install and maintain such an alarm system. The environment of the cave would destroy any type of system, which would have to be electrically operated. The conditions leading to a flood in OFD are very variable and not fully understood.

It has therefore been decided to include on the permit a strong indication that only we-suited cavers should enter the stream and that novices should not be taken into the stream. The Club will also install marker stakes in the stream in OFD 2. These will be set to some water level and do not mark a danger level. They will only act as an indication of a rise or fall in the water level. Each stake will be placed at a point where the stream may be left. The choice remains with the caving party.

Much discussion could still be had about the various factors that, together, contributed to this tragedy. How much clothing, equipment, personal experience and judgement were responsible will remain in the realm of speculation, controversy and individual opinion. However, the inescapable conclusion is that high water in the streamway is not to be underestimated, and taken with other testimony published here, water can become dangerously high in a very short time indeed. Many parties, before this incident and since, might just as easily have been victims to similar vagaries of the streamway.

Ogof Ffynnon Ddu 1 in Flood, Christmas 1994

All night long, the rain lashed against the bedroom window of my wife's parents' house in Cowbridge, waking me several times…… In the morning I drove up to Penwyllt…. to be told that the weather had been the same all over the Christmas break. I later learned that, between 10am on the 25th December and 9.30am on the 27th, more than four inches of rain fell in the valley.*

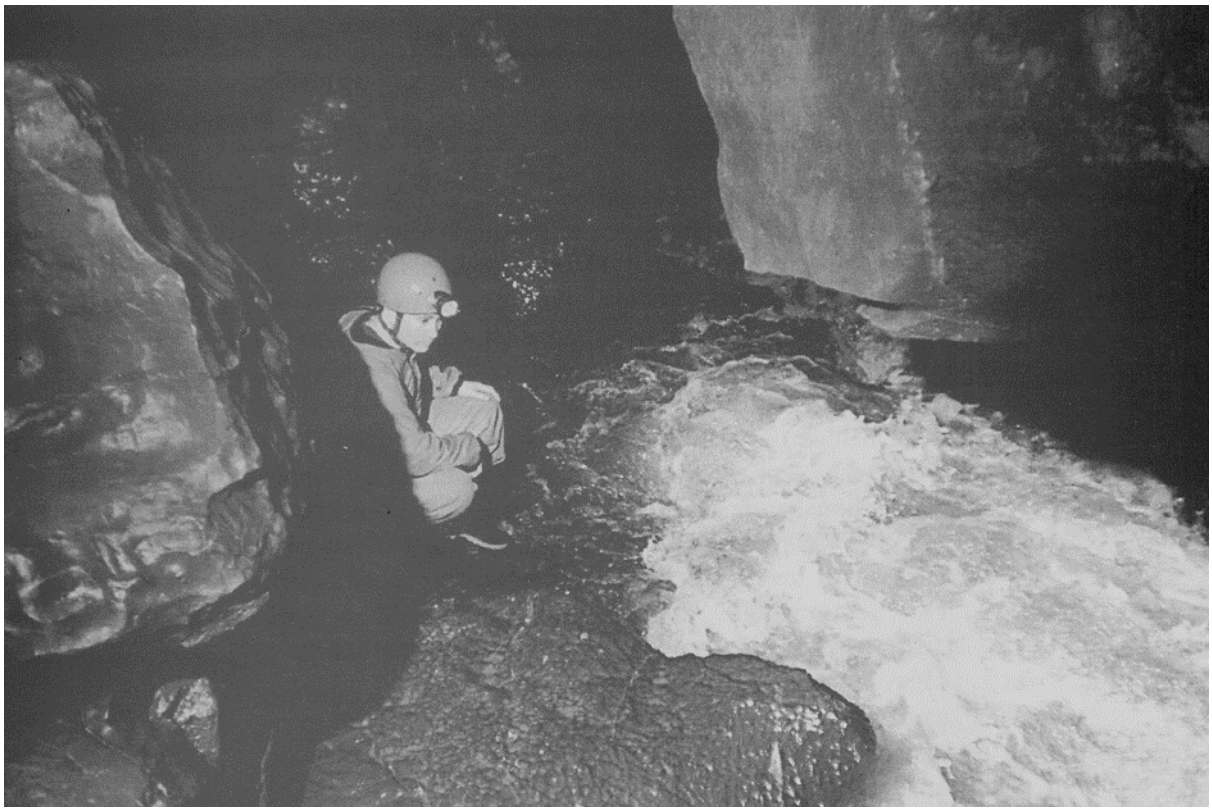
Since caving options were limited Steve West and I later decided to go into OFD 1 and take a look at the water levels… As soon as my head dipped below the gate, I could hear an ominous roar. Inside the cave, water streamed from every crack. There were streams flowing over what are normally dry floors, and the rumble of the main stream could be heard everywhere we went.

We went first to The Step. The water rushed past, somehow not as noisy as one would have expected but very impressive: normally when you stand on The Step, the ledge you've just clambered down from is at about chest-height, today the water was lapping over that ledge.

For those that have never seen it, OFD 1 in water levels this high is well worth a quick trip; it reinforces the respect one must pay to water underground…. Just be careful!

**Weather information kindly provided by Laurie and Mary Galpin. They recorded a total of 97.52 inches of rain during 1994 at their home weather station, of which 9.78 inches fell between Friday 23 December and Saturday 31 December.*

(The above description has been taken from a longer article by Tony Baker published in SWCC Newsletter 115.)



Steve West at The Step, December 1994.

Photograph: Tony Baker. Originally published in NL 115 and scanned from that publication. Compare this image to the two photographs on page 6. The water level on this occasion would appear to be somewhat higher, with less visible turbulence and back-wash down stream.

High water in OFD 1: Summer 2017

Finding yourself in a rapidly rising streamway isn't ideal at any time whilst caving. Experiencing that, whilst taking a group of new would-be cavers on their first trips in OFD 1, is definitely something I would not like to repeat.

It was the beginners' weekend in June 2017 and we had around 20 new people coming to try caving. The Saturday had gone well and they'd enjoyed their trips. Most had been around OFD 2 that day, so, Sunday was time to introduce a number of them to OFD 1.

My memory of the weather that weekend is that it was dry in the days immediately preceding the weekend and during the day on Saturday but there was rain in the early hours of Sunday morning. It had stopped by the time we were having breakfast.

Two groups were going to do the round trip in OFD 1. We decided between us to do the trip in opposite directions, with Tim Lewingdon's group going up the streamway to start and my group going through the Escape Route first and then exiting via the streamway. I went ahead and checked the level of the water at the Step before we began the Escape route. It was low there - only barely lapping the Step.

We then continued the trip and didn't think twice about the river all the way around. We met Tim's group in the Pi Chamber area and they reported that the river was low and the poles on the pots were all above water when they had gone up the streamway. When we descended Low's Chain, I left my bag on the floor and we then went up to have a look at Boulder Chamber.

Getting into the river at around 13.50, it didn't feel pushy at the Sump and I was talking and taking photos of the group in the streamway. We continued downstream. I started to notice more water streaming down the walls, then I felt it start to become more awkward placing feet on the floor. When we got to the 4th Pot the pole was slightly under water, so we took care crossing. A few feet further on, at the 3rd Pot, the pole was under around 6 inches of water. When we turned the next corner some of the beginners were starting to have trouble walking downstream and one was knocked off their feet and picked up by Malcolm and Bill. Luckily, the group were all still happy and didn't realise that the river was considerably different to what we were expecting. The group were great and I think this was key. If we'd had people panicking, then that would have made everything much worse.

The party in the streamway at 13:55
Photograph: Claire Vivian

We didn't like the idea of heading back upstream at this point, so we carefully continued down to the Maypole Chain, which was very near. As people climbed the chain, I looked at the small cascade next to it. It was under water. There was just a bend in the river and the usual handholds were submerged.

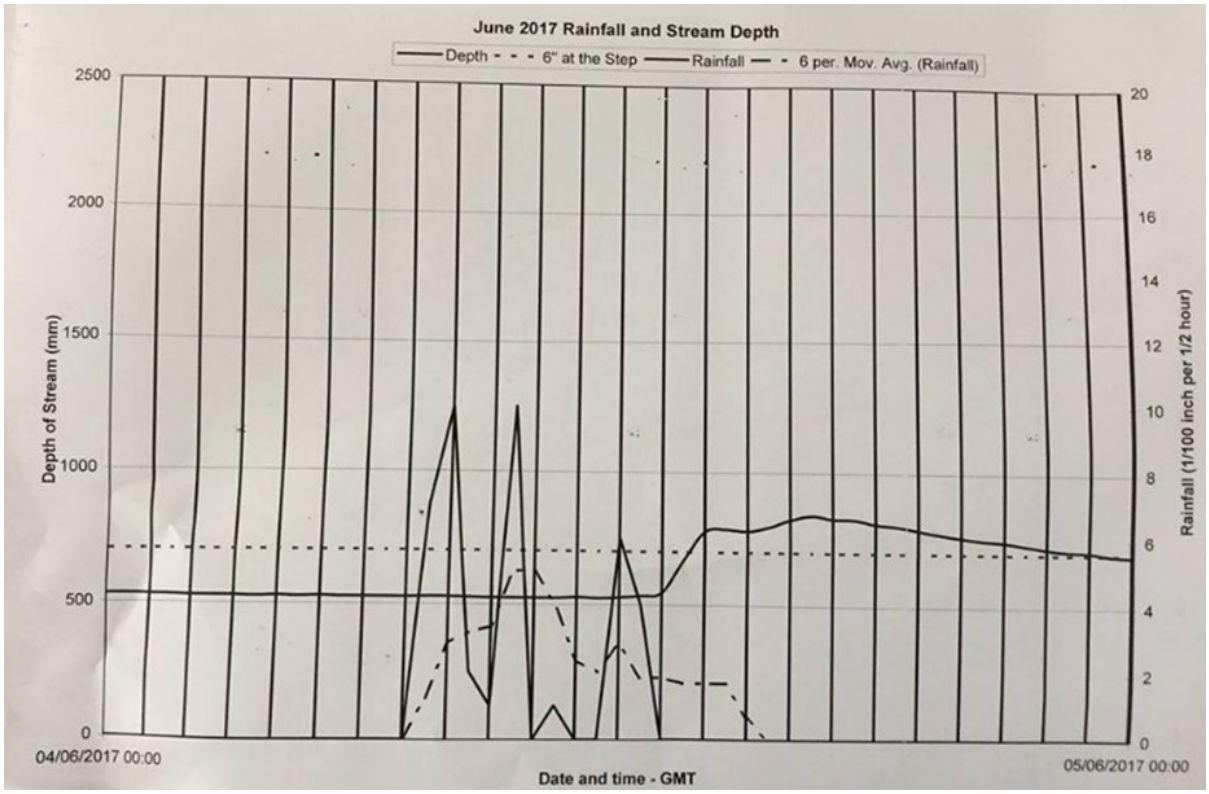
It was a bit of a step-up for the team to cross the wire at Maypole Traverse, but they all managed admirably well. When we got back to the start of the Escape Route, Malcolm and I went to the Step to look at the height of the river. It had dropped considerably and was at a height that we would have happily taken people in; barely sloshing around ankle height at the Step, much the same as it had been at the start of our trip.

This in itself is bizarre, as it does not reflect what the depth gauge recorder shows. According to that, the river remained at a depth greater than 6 inches at the Step for a period of 6 hours. This was definitely not what we saw.

We missed our callout time by around 30 minutes, by the time we'd walked back up the hill. A group had been doing an OFD 2-Cwm Dwr through trip at the same time as we were doing our OFD 1 round trip and they reported that there had been no noticeable change in the river while they were in it. It had been low all the way through.

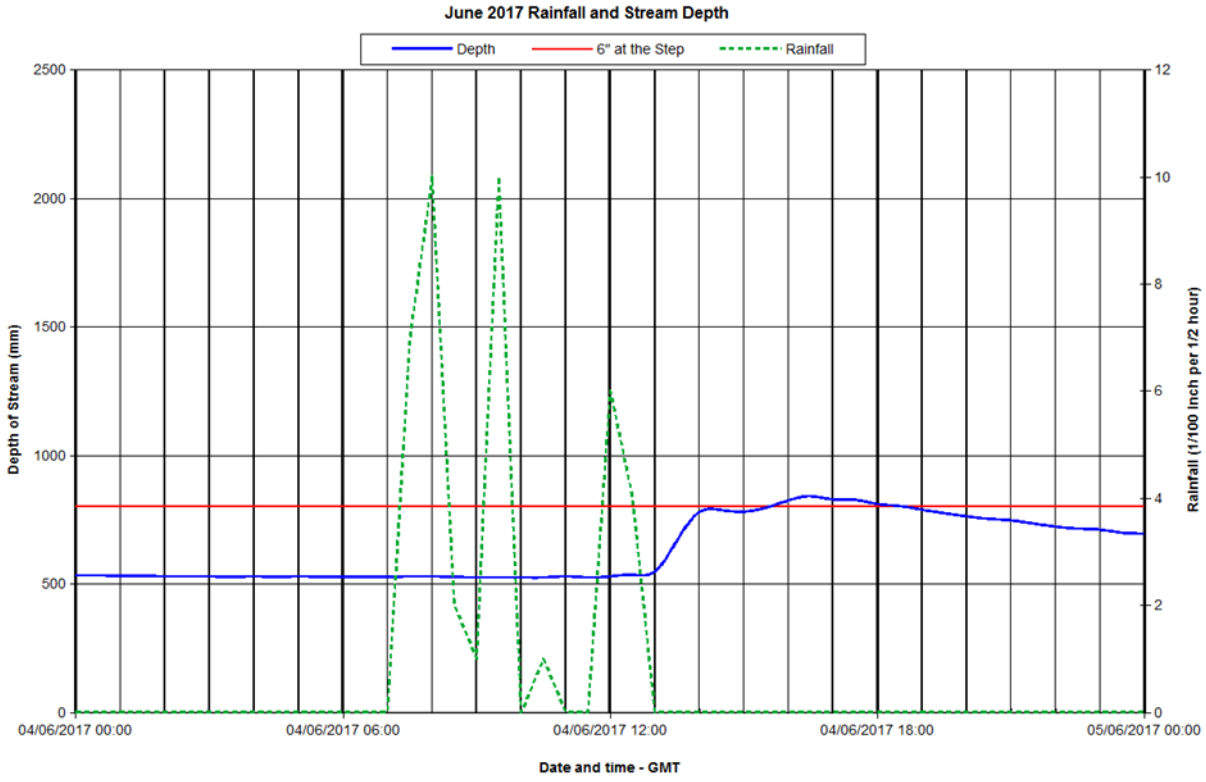
The whole trip left me feeling pretty shaken. It took a number of visits for me to feel comfortable going in the streamway again and taking beginners caving.
Previously unpublished account by Claire Vivian.

The plots and commentary below should be read in conjunction with Graham Christian's article on the subsequent pages.



Photograph of the depth and rainfall record for the day of Claire's trip.

Back then, a level of 150 mm at The Step was taken to be equivalent to 700 mm depth at the gauge. This is represented by the dotted horizontal line on the plot. It can be seen that the depth at the gauge rose rapidly from about 13:00, passing the nominal '150 mm at the Step Level' at about 13:30 and not dropping below it until nearly midnight. This conflicts with Claire's observations in the cave reported above.



Print-out of the data for the same period as shown in the photograph above.

This time with an alternative notional '150 mm at The Step level' (the red line) at about 800 mm at the depth gauge. This adjustment in 'calibration' fits more closely with Claire's observation that the stream was, "barely sloshing around ankle height" at The Step. But it does not address the fact that Claire experienced such high water in the period between 13:00 and 14:00 which one would suppose be equivalent to 300—400 mm at The Step—so approaching or over 1000 mm at the gauge. Clearly there is much yet to learn, and more development work to undertake with the instrumentation as Graham Christian describes in the article which follows.

Conclusions: what lessons can we draw from this historical review?

- There is much that we do not understand about how the stream behaves despite over 70 years of experience and study. In particular the relationship between streamway behaviour and weather is by no means clear.
- We are a long way from being able to explain WHY it behaves as it does. There is much scope for further study and research.
- There is no doubt that the stream can rise very rapidly and thus can become lethally dangerous over a timescale measured in tens of minutes rather than hours.
- Once it has risen to a high level the stream can remain high for days at a time.
- Damming the Nant Byfre and diverting some of its flow away from the sink can ameliorate stream conditions.
- Certain parts of the cave, notably the lowest parts of OFD 1 and the area around Piccadilly can flood to considerable depth.

Gauging The Ogof Ffynnon Ddu Streamway
An interim report
Graham Christian

After I joined SWCC at the end of 1992 and started to come to Penwyllt more often, I could not help but notice that it rained. Sometimes the rain was heavy, sometimes light and sometimes it was just "soft". The duration of rain varied between short showers and what seemed like many days. Reports would come from cavers on the state of the streamway, particularly the level of water at the Step in OFD 1. It soon became apparent that it was difficult to estimate what state the streamway would be in based on the empirical observations of the rain. Thus, in 2001, I built a tipping bucket rain gauge that allows quantitative observations on a half-hourly frequency and also, if you really want, each individual tip of the bucket. Atmospheric pressure readings are also logged on the half hour. This has been running nearly continuously since 2001, only interrupted by debris blockages, power cuts and sheep chewing through the cable.

We could now establish just how much rain had fallen and better predict what the level of the streamway would be in rough terms. Finding the level of the Afon Tawe displayed on the internet then became a bonus as we could see what sort of effect the rain was having on water levels in a general local sense. More fireside chatting ensued, a grant was obtained from the then CCW and Stuart France purchased a pair of pressure sensors for the club, fitted one of them to one of his logger boxes and deployed it in the OFD 1 stream. This has been running now since 2015, with only a few breaks in the logging. The logger system does, however, require a trip into the cave in order to get the historical data.

This historical stream level data could now be compared to the historical rainfall data and we could start to look for any patterns emerging. This was all very encouraging but still did not answer the question: "What is the streamway like?", which is asked so often at Penwyllt by cavers planning their trips underground. I was once able to say to a party that they would be able to get into Waterfall Series, but not be able to get out again, based on what the rainfall that morning had been so far. They revised their planned trip to include looking at the water level in Upper Flood Passage from the top of Low's Dangly Bits at the time they would have been expecting to have left Waterfall Series. Apparently, I was right in my prediction. However, we still did not know the water level before they went underground or exactly when it rose enough to overflow down Upper Flood Passage.

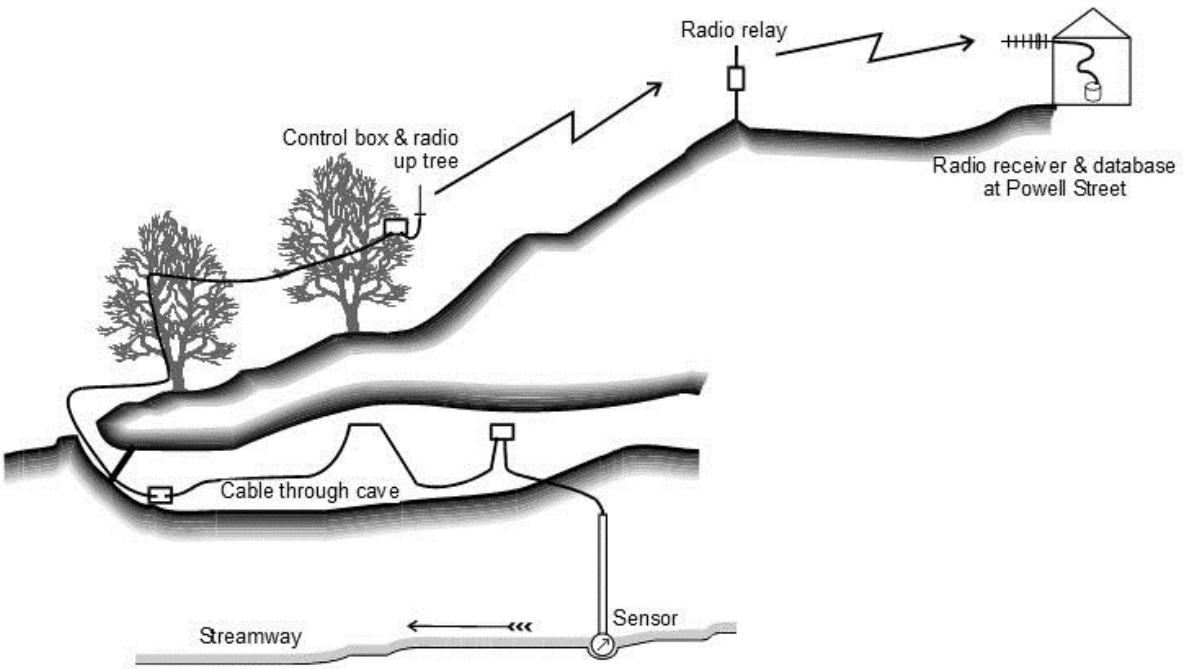
It was time to look at getting the information (data in context!) back to the cottages in real time. We wondered if a cable could be run all the way back to Powell Street, but had to knock that one on the head as there is the public road and old railway to cross plus numerous walls and fences to run along, with the added problem of sheep (and cattle) breaking the cable. With Stuart France we had looked at setting up a radio link down to the offices at Craig-y-Nos Country Park. With the aid of a stainless steel dog bowl reflector, data was transmitted by radio from above the cave to the front of the offices. Although it was tentatively agreed with the BBNP that we could tap into their intranet, we were not that sure about involving a third party in the chain. We could see that it would only take one person to change job or an issue on their network and we would be up the creek without a paddle and little means of getting it resolved quickly. The unreliability of their webcam at the office reinforces this view. Better to keep it all in house with our own members who had a real interest in getting it sorted and keeping it running. Gareth Edwards was asked if he could help in setting something up and we started to look at our other radio options.

We had a look at what radio modules were available on the market and found that besides the Xbee radios from Digi, there was a cheaper type with the same pin connections and simpler to set up. So much so that the XRF modular radios are literally plug in and go. I bought three and they then became obsolete (due to the company that made them being taken over, the new company then changing direction and probably hanging onto the intellectual property rights so no-one else could re-start production). Well, the XRFs are great for testing even if they cannot be used to extend the network.

The first tests were to see where the radios could reach, both from the chosen spot on our land above the cave and from the club's headquarters looking towards OFD1 . With the aid of some hand-held computers, we set the radios transmitting and were able to mark on a map a line that was at the limit of reception from first one location then the other. (I wish I had £1 for every time someone in the world has transmitted "Hello world"!) When done, we had a small area at the back of the quarry behind the Stump where the two wiggly lines overlapped, designating where we could put in a radio repeater or relay. Given the issues around a solar powered relay - visibility, theft, farm stock and not least the sun - laying a cable to provide power from the Stump was mooted as the best option. Wealden CMS readily agreed to the small amount of power required and NRW funded both the 250 m of armoured cable and the means to put it in the ground. A 12 V 17 Ah battery is trickle charged in the shed at the Stump and fed to a box on a pole where it is further converted to 5 V before feeding a radio configured as a repeater. As the transmission distances involved were going to be at the limit or beyond that which a simple monopole antenna would achieve, I found a useful program on the internet that enables one to design and build your own directional Yagi antennae. These greatly increase the range of a radio and should help the signal get through the foulest of Penwyllt weather.

Having proved the feasibility of a radio link across our land, there was also the matter of getting the data out of the cave and up to the transmitting tree. Fortunately the club possessed a large amount of telephone wire that could be used for this purpose. A certain ex-BT engineer was pressed into service and the telephone wire was pulled into the cave from the entrance all the way to the existing logging point above the stream. A great deal of effort was taken to hide the wire as much as possible, only one piece really showing as it comes down a wall. Another length of wire was strung in the trees down to the entrance and the two joined together in a sealed box.

Below is a rough diagram of the system.



The two pressure sensors that we have are made to an industrial standard that has a very useful feature for our purposes. They work on the basis that as the water depth varies between 0 and 4 metres, the current that flows through the sensors varies between 4 and 20 milliamps. For those that don't "do electricity", suffice it to say that at any one time the current in an electrical circuit will be the same anywhere in that circuit. This means that with all the wiring connected up, a current of, say, 15 mA flowing through the sensor will also be flowing through the electronic circuit up the tree. "All" we have to do is measure that current, convert it to an actual depth and transmit it back to the club where it can be saved to a file on a computer.

Above: Fitting the junction box just beyond 'The Traverse' OFD 1. The streamway is below, to the right.
Photograph: Carlo Ryan

After a bit of faffing trying to work out a circuit, David Eason assisted us by finding a very useful ready-built module that would not only read the current in the circuit and convert it to digital numbers, but also boost the voltage of our system (3.3 V) to run the whole loop down to the cave at 16 V. All on one small plug-in circuit board. The internet also provided all the coding to calibrate, run the thing and generate an actual depth reading. Based round an Arduino Mini Pro microcontroller, we have a device that generates power to run a sensor, read the current, convert it to a depth and transmit it via a radio relay back to the club where it is written to a file on a computer. This is all good stuff, but throws up a number of issues that need to be addressed if we are to have an anywhere-near reliable system that gives us continuous data into the future. Yes, we now come to the "however..." bit!

While working as a data systems engineer I was exposed to things like "reliability centred maintenance" and "failure mode analysis". This means that I appreciate that there can be many ways in which the system can fail and we need to make sure that the consequences of failure are reduced to the least disruptive. Each item in the chain can fail in some way, some of which are going to be unavoidable, but we need to make them as unlikely as possible. The electronic parts (other than the sensor and 4-20 mA receiver) have all tended to come from the "hobby" end of the market, which has kept the development costs down, but limited us in functionality.

Right: The pressure gauge assembly in the OFD streamway.
Photograph: The Author

At the controlling tree end of things, besides the microprocessor, 4-20 mA unit and radio, we need a reliable monitored power supply, a real time clock and memory card to log the data locally in case the data does not reach the file on the computer back at the club due to failure further down the chain. To achieve all this we need a more capable microprocessor board. The radio modules are no longer available so need to be replaced with Digi Xbee units that are likely to continue in production for many years to come, and are to some extent a "standard". The relay will need another microprocessor as the Xbee radios seem not to be configurable to a simple repeater mode like the XRF radios, and while we are there, add another memory card to trap the data in passing. Back at the club, write the data to another memory card on the receiving computer before it gets to a server for displaying as fancy graphics on a screen. Gareth has looked into this and found an integrated system called "Waspmote" that will handle the upgrade. All this beefing up of the system will cost money, so a grant has been applied for, although at the time of writing we have yet to hear if we will get the money.

Relay antenna on mast Photograph: The Author

One thing that this project has done so far, is to focus peoples' minds on the state of the streamway. The drying up of the lower part in the summer of 2018 was of particular interest as it demonstrated that there is a hitherto unknown conduit from the pool below Maypole Chain. This went some way towards explaining why higher water levels in the upper part of the OFD 1 streamway were not so apparent at the Step during a trip in June 2018. The data collected so far is showing promise for predicting trends, but will need to be treated with caution. Trying to make a rule that the stream will start to rise x hours after the onset of heavy rain could be fraught with danger as there will be other variables such as pre-existing ground moisture and water levels. It may be that in future we will have enough data for a budding hydrologist at university to take it on as part of their studies.

Looking to the future, there are many other things to do. Not least, we need someone to take the data and present it in a useful form on a web page, perhaps firstly on a screen in the lobby area of the club and ultimately on the internet. Any volunteers? Once we have reliable data coming in, the original sensor can be removed and redeployed elsewhere in OFD. I have it in mind to monitor the main stream somewhere near the bottom of Maypole Inlet, to try and get an idea of how the levels there may compare to the OFD 1 readings. The data from here would probably not be in real time, but collected from a logger up in the Maze. Another area that people have talked about is at the Confluence with the Cwmdwr stream. I have some reservations about this, as I have seen foam 10 m up the wall and the top end of the sensor cable needs to be above water level to let the atmospheric pressure balance pipe up its middle breathe – the cable is 12 m long. How the 0-4 m sensor would cope is another question. Can we get data coming in from Dan yr Ogof as well? It is certainly feasible. I have also been pondering on re-using some of the old weather station kit from above the Party Quarry to back up the current rain gauge and perhaps use some of the other sensors like the soil moisture probes.

If you are interested in getting involved with any of this speleological investigation, then do have a chat. I want to share the load out so we can hopefully make more progress – I don't want to have to learn new skills if others in the club already have them!

Graham Christian
13/09/2019

"I'd love to see it, but don't want to be involved when it happens"

A discussion on flooding in Oof Ffynnon Ddu

Andy Freem

All photographs are the author's unless otherwise credited.

We all know that underground flooding is a potentially lethal hazard best avoided. When heavy rain falls, we have all made the decision either to stay safe in the HQ or visit upper relict OFD passages. As a consequence, remarkably few of us have seen the streamway in its most energetic, natural state. Our very limited experience comes from observations, at vantage points in OFD1, or audibly, in the form of a deep, ominous rumble from Cross Rift or Midnight Passage, accompanied, very occasionally, by an evocative mist of water droplets carried by cool, powerful draughts.

So our present understanding of what actually happens must come from evidence left behind after the events, the known drainage characteristics of the system and the application of some basic hydrological theory. The conclusions might be of interest and even save a life one day.

All streams have unique landform features that influence their flooding signature. Although they will evolve over time on a human timescale they can be considered fairly **long term**, unless their catchment area is altered by industry (e.g. forestry or drainage schemes). **Transient** (very short term) influences are largely of meteorological origin or made by seasonal variations in water storage.

Figure 1. Below, shows a simplified illustration of the possible factors that affect the pattern of a flood event. (Long term influences are shown in red and transient influences in blue.)

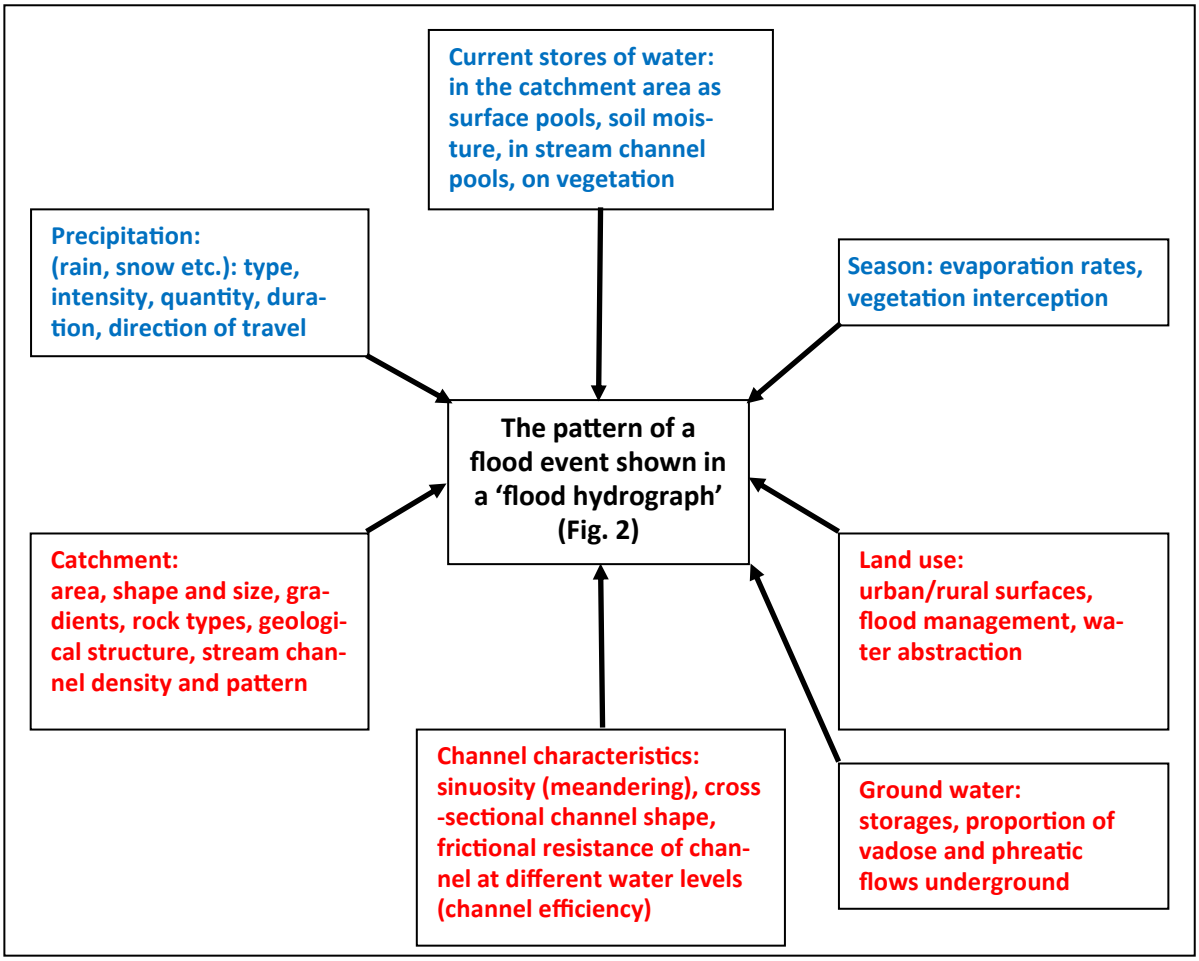
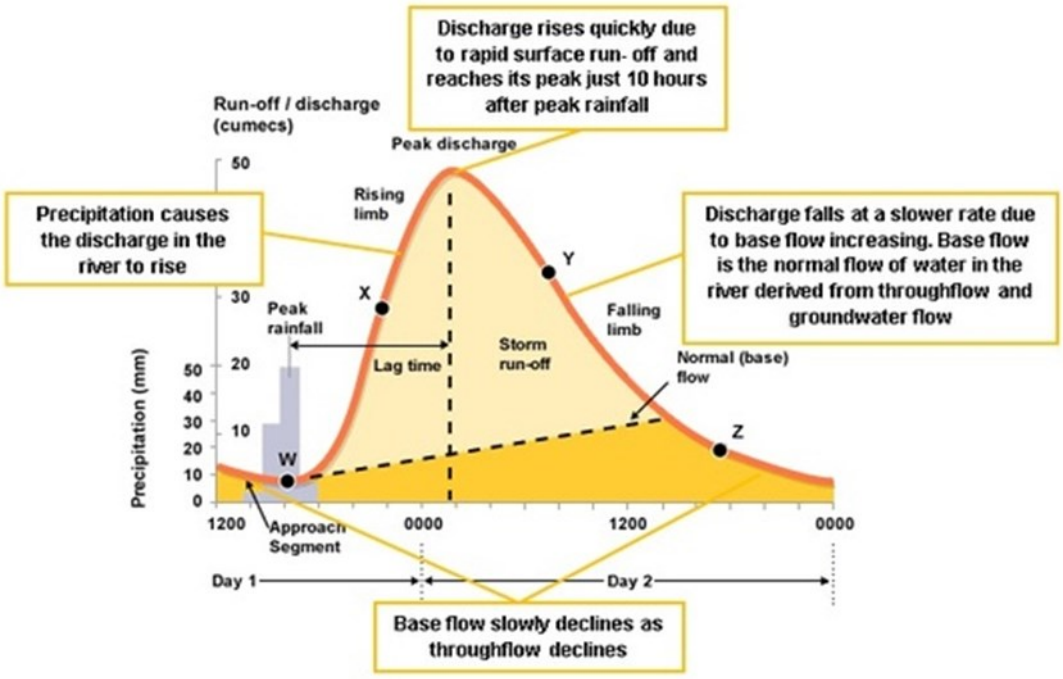


Figure 2. Below, a generalised flood hydrograph model.
(copied from http://thebritishgeographer.weebly.com/hydrographs-recurrence-intervals-and-drainage-basin-responses.html and credited therein as 'Adapted from BBC', probably from: https://www.bbc.co.uk/bitesize/guides/zpqwwmn/revision/1)



Flood characteristics are best presented as a graph called a flood hydrograph (Figure 2, above). Each component can be adjusted to illustrate the impacts of both transient and long-term characteristics of the stream in question. In short, each stream and cave has a reasonably large suite of characteristics that control how it floods.

Data collection for constructing flood hydrographs involves continuous monitoring of precipitation and consequent stream discharge. The stage (water height) monitoring equipment now installed in OFD 1 and the Penwyllt weather station are the first steps in this process. (See the article by Graham Christian on pages 20 to 23 of this Newsletter, Ed.)

Precipitation is measured in mm/hr (giving intensity and cumulative quantity). Stream discharge is measured in cubic metres per second or 'cumecs' - and requires the mean velocity of water flow (m/s) through a measured cross-sectional area (m^2). The velocity values for a cross-section are hard-won, needing a robust flow velocity meter to acquire values from multiple positions within a chosen stable channel section and at different water levels. Once obtained they can be used to calculate discharges with just stage (depth) measurements being recorded:

Q = A x V

Where **Q** is the discharge , **A** the cross-sectional area and
V the mean velocity of water through that cross-section

This is what the Natural Resources Wales does with all its fixed cross-section river flume stations across Wales but collection of data in the OFD steam is a very challenging task. Not least because of the remote locations, the time and cost involved and the violence of the flows in high water making velocity measurements very risky for personnel and kit!

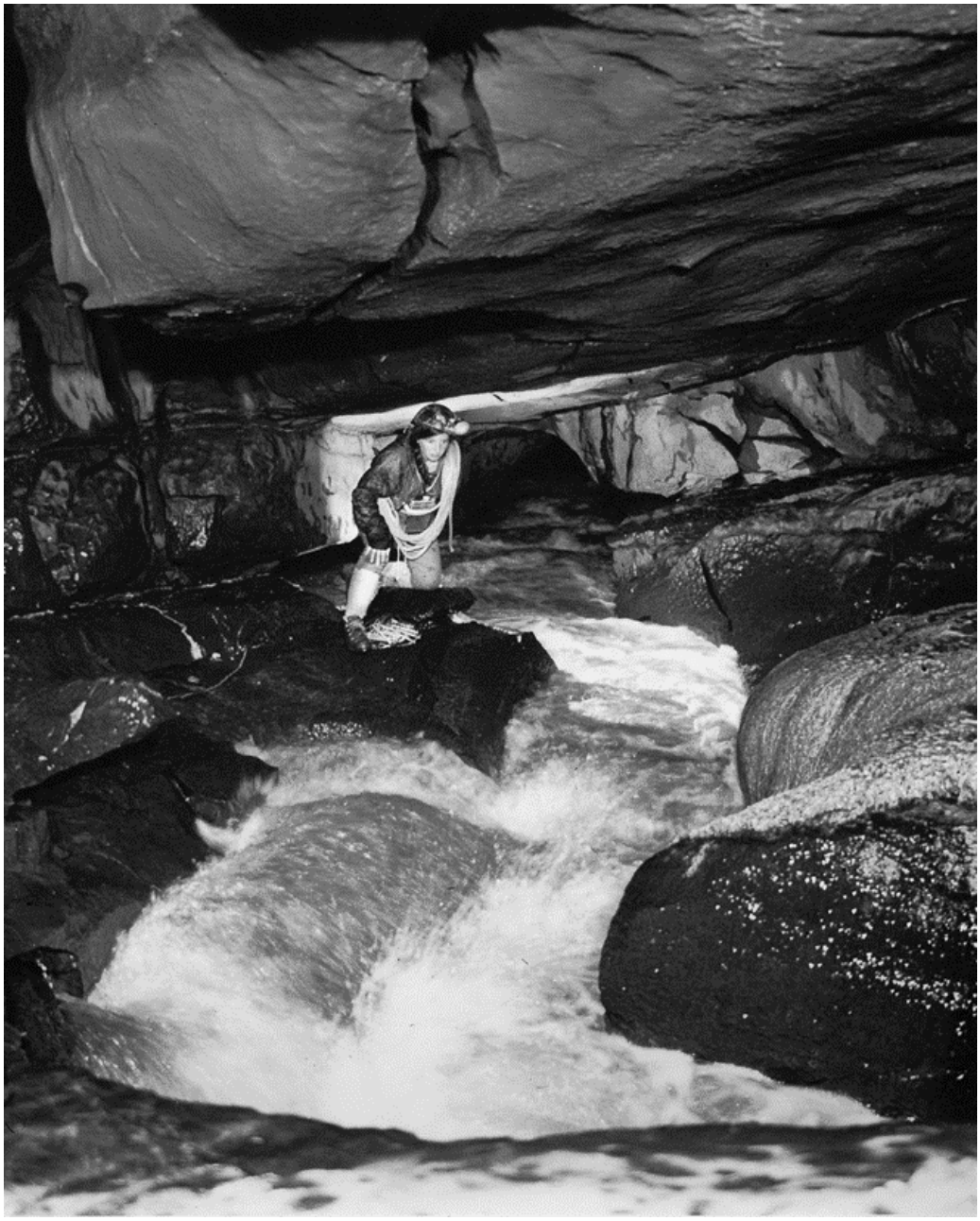


Figure 3, above. OFD 1, with the main stream in flood at The Step.
Even estimation of mean velocity in such violent conditions is near impossible and a straight section with more laminar flow is required.
Photograph: Paddy O'Reilly

Towards a predictive model of flooding in OFD

At present we can only use disparate observations and evidence gained from other streams to produce a predictive model of flood characteristics in the OFD streamway. Some might see this as surprising, given that we have been caving in it for over half a century, but we really do not have the data.

As cavers, rather than hydrologists, we can simplify the objectives. For interest and safety, we need to know from the model:

1. the reaction time (lag time) between a pulse of rainfall and the peak discharge
2. the rate of flood recession (how quickly does the flood die-away)
3. the timescales of changes in velocity of water flow (surges or pulses)

The multiple influences shown in Figure 1 compete with each other to dominate the OFD flooding model. The list set out on the following pages is far from definitive but we have to start somewhere.

OFD characteristics (roughly in geographical sequence) that modify lag times, speed of recession and flood velocities.
(red boxes for speeding up, green boxes for slowing down)

Unlike many complex cave systems, OFD has just one main surface stream input that comes, via the Byfre sink, from high up on Fan Gyhirych . It's a long way to OFD 2 and OFD 1 and this should contribute to long lag time.

Its mean gradients are high in the surface catchment upstream of the sink (the Byfre) so, if catchment storages are full (typical in autumn and winter), peak flow water will arrive quickly (within an hour) at the sink.

The Byfre sink is constricted and water can pond back here, regulating and smoothing the flood impact inside the cave.

Figure 4. The Byfre sink, with flattened grass flood debris at bottom of picture.

The OFD 3 stream passage has a low gradient overall and significant potential for pooling (channel storage). In flood it is still possible to wade in deep, fairly slow-moving water right up to a temporary sump that forms before Smiths Armoury (as did the first discoverers during a severe flood event). Its water depth has been observed to increase by a critical 50 cm in an hour. At one time a food dump was left beyond this just in case the sump formed during exploration.

Figure 5, Left.
The low gradient of the OFD 3 streamway with water storage in deep pools.

All this 1274 m of passage should slow down and even out a flood pulse in the rest of the system.

The OFD 2 streamway has over 3 km of passage. Overall it has a significantly steeper gradient, particularly near top waterfall and above Marble Showers area. Water receives gravitational acceleration here.

OFD 2's canyon-like passage has no floodplain, so high discharges increase water depth with little increase of frictional resistance from the walls. In places the water can form an almost flume-like laminar flow. It banks round bends with relatively small stage increases and can rapidly become impossible to wade through.

Figure 6. The OFD 2 streamway above the Second Oxbow showing high velocity / low friction flow even when not in flood.

All OFD 2 and OFD 1 inputs are classed as percolation water where underground channels concentrate disparate small inputs into channel flow. This is the case even for the biggest input, the Cwm Dwr stream. Although one would expect percolation water to react slowly due to constricted and inefficient routeways, many of the OFD 'percolation' sources do react quickly to rainfall, due to pre-existing relict passage forming conduits. The stream into Arete Chamber, the inlet near Straw Chamber and Bowani Junction are examples of quick feeds (with a possible reaction time of just 15 minutes). The many waterfall inlets in Marble Showers are likely to have a similarly quick response for their steep feeds from the jointed grit and shakeholes above.

Figure 7.
Marble Showers inlet responding to a rainstorm.

The hydrological connections between OFD 2 and OFD 1 are largely phreatic (sumps). Judging from the high backup levels of foam in the dark tubeways near Piccadilly some part of the flooded system is sufficiently constricted to allow a considerable head of pressure to develop at the upstream end. A flood pulse can quickly be transferred though phreatic loops by the head of pressure, well in advance of the actual water flood itself. This would be visible in a flood event in OFD 1, beginning with clear (sump) water before colouring with suspended sediment a short time later. In the OFD 1 Boulder Chamber the arrival of a flood pulse is a true multi-sensory experience with thumps and bangs as air gets trapped and released , followed by that 'Titanic' moment of water welling up from various joint lines and then amalgamating to make the return to Lowe's Chain an exciting dash. The water under the rope can take minutes to become an impassable torrent, maybe 1 m deep. This issue led to creation of the Escape Route, and also, originally, a small entrapment food dump under a boulder at the top of the Waterfall Series climb.

Figure 8.
The OFD 1 Stream at very high velocity 'banking' round meanders.

In summary

It would seem that in spite of a conciliatory start, the OFD streamway overall conspires to create aggressively short lag times, high flood peaks and, because the water passes quickly through, fairly rapid recession after the flood peak.

Optimistic adventurers may hope to have time to escape once the initial pulse arrives or even, possibly, attempt to sit one out, but there may be another dangerous hydraulic phenomenon at work in OFD 2.

The deepening stage of a flood pulse converts the channel into an increasingly efficient conduit. The frictional-control-to-velocity reduces as the wetted perimeter increases marginally compared with the cross-sectional area of the stream itself. Crucially, water accelerates in comparison with the water preceding it, incorporating water downstream. The pulse gets faster and bigger, and the longer the channel (as in OFD 2) the more this can happen. We can see this phenomenon in streams on beaches that flow in tiny pulses, and also on roads where sheet flow is converted to linear waves. On an OFD scale, the pulse is a surge of water, moving faster than the mean flow of the stream water itself and even containing sufficient energy to move the larger of the 'bed load' rocks we see lodged in the passage. A caving group may seem to be in control of their situation and then suddenly loose that control completely. After the pulse, which may be a few minutes long, there would be a lower flow where water has been partially drained forward, but then another pulse will follow, and so on.

Summary continues overleaf ….

Summary continues…

This phenomenon would be at its most evident towards the lower end of the OFD 2 streamway, for instance around Marble Showers and the Confluence, and there have been some serious flood experiences here. However, no monitoring has taken place, so this is conjecture at this stage. It is possible that above mentioned flood pulses seen at Lowe's Chain could be a consequence of such events being conveyed rapidly through the OFD 1.5 sump system.

Conclusion

Many of the long-term characteristics of the OFD stream catchment combine to create a 'flashy' flood response to rainfall events. When in flood, the efficient nature of the channel in the majority of the streamway can create the potential for extremely hazardous rapid-onset peak flows.

Two dramatic images of the OFD 1 streamway. The first image is just upstream of Pluto's Bath passage in flood conditions, the second, just downstream.
Both photographs: Tony Baker

Recent Diving Developments in Ogof Ffynnon Ddu 1

Drawn From Dive Reports by Josh Bratchley
Selected and Presented by Bob Hall

The history of underwater exploration in Ogof Ffynnon Ddu is well reported elsewhere. Steve Thomas provides an excellent overview in Newsletter 118, the 50th Anniversary publication. More recently Josh Bratchley (BEC / CDG) has carried out a series of dives in OFD 1. These are reported in CDG Newsletter 208, July 2018, although the dives were spread over the period 2015—18.

One sequence of dives pushed upstream into The Sump, the point where the main stream first appears in OFD 1. The second sequence pushed downstream from Dip Sump, following the passage into which Dip Sump overflows. The text below is taken from Josh's dive reports.

March / April 2015 'The Sump'

"….Line was laid for some distance, around multiple awkward right-angled bends and eventually passing the previous limit at -11 m. The diver continued, encountering much loose line, with the first obstacle being an upwards tight corner rising from -15 m to -13 m and plateauing in a complex bedding area. A rift back and to the right was too tight, along with a vertical rift in the roof forwards and off to the left. The way on is straight on to the head of a shaft with rocks perched along its edge. This was descended with caution to -18 m to meet a gravel floor and an uneven roof, sloping downwards to -21 m. Beyond this a reduction in passage width gave way into a small chamber with a shifting gravel floor at -24 m. The stream was deemed to be emerging from a small tube/bedding to the right, sloping slightly upwards but small.
Due to being in the sump for nearly an hour at this point the diver was very cold and visibility had reduced slightly. It is likely a degree of narcosis was experienced and the diver chose to tie off the line and return to base….."

"……A return to survey the previously found passage and to attempt a push at the continuation. The diver carried slightly larger (10 litre) bottles to the sump this time anticipating a longer dive and reasonable time in constricted passage at c. -24 m.
The difficulty would be diving the bottles through the initial constricted passages down to the wider sections beyond the plateau above the shaft. Surveying was undertaken on the way in against the flow and after much wriggling and awkwardness the diver made it to the shaft and further into the deeper sections. Some tidying of the previously laid line was also undertaken although this sharp, restricted sump seems to eat line no matter how well belayed.
The final chamber was surveyed and the diver then entered the slot in the right hand wall, beneath a large, long roof pendant. The diver felt much more "with it" this time round and pushed for several body lengths into the passage. It is actually a bedding, with a slightly larger section in the middle. However, it seems to get smaller and corners in a slightly upwards and left direction. The diver turned around after taking a bearing and left for dive base. The final bearing of the sump is towards the west, strangely away from Downstream Dip Sump…."

June 2018

" …. Continued progress was then made on the 5s to the known end of the sump where the reel was attached to the previous line end (about 5 m before the gravel chamber reached on previous dives) and the diver pushed into the small tunnel beneath the right hand wall flake that marked the current end.
After a body length of thrutching into very sharp passage at -23 m the diver saw an angle of the tunnel that appeared to show it reducing slightly in size and becoming very complex. A return was made, the reel brought back to the 3 litre cylinder stage point and clipped to the line. A quick check around this complex area revealed a small parallel side passage. However, prospects looked very slim here…….
……..The diver feels that his time exploring this sump has come to an end.

April 2016: Downstream Dip Sump

A dive to survey and push further, hopefully towards Main Stream Sump. Similar to last time, a pair of 7 litre cylinders was carried in to the cave and through Hush Sump to the Dip Sump air bell. Progress was then made once again painstakingly down the rift to the sump pool. Once under water, the diver began surveying, revealing a maximum depth of around 14 m prior to the previous limit reached on 14-03-16 (See NL 199:13) with similarly angled corners. Upon reaching the known limit, surveying was halted and the line reel deployed, for continued exploration. The passage remained cloudy, following the clouds of crusty suspended breccia with the flow with little change to the passage make up for a short distance until a right turn into a more elliptical, lower, tube-like passage in seemingly better rock.

After turning back on itself to the right, trending slightly upwards a gravel squeeze was encountered. A small hole prior to the squeeze was noted to the left but not pushed. The gravel squeeze was pushed and passed after some wriggling to enter the gravely base of a shaft at 9 m depth. Ascending in the shaft revealed a significant decrease in rock quality and visibility was decreasing, though not enough to be of concern. Of bigger concern was the frustrating reduction in the size of the shaft - becoming awkward at 4 m depth rendering a route to surface unlikely in the section of the shaft roof being investigated. No obvious way on was noted. With visibility continuing to reduce in this area, the diver tied off the line and retreated, surveying back; the gravel squeeze remaining to be an obstacle on the return. Once back at 14-03-16 limit, the diver exited the sump with no difficulties, other than the usual struggle out of the rift against the flow after exiting the sump pool into Dip Sump airbell.

Some commentary on these dive reports and the related surveys on the following pages.

Several aspects of what Josh describes in his dive reports are highly relevant to the subject matter of this Newsletter—the nature and behaviour of the OFD stream.

Bear in mind that the 'normal' flow in the OFD 1 stream all emerges from 'The Sump' (as far as we know). And 'normal' means up to perhaps knee-deep at The Step. To my mind it seemed extraordinary to consider that the stream flow has descended to a depth of almost 25 m before turning uphill and rising from The Sump: that's some 'U bend'! However, Clive Westlake has since informed me that some loops in the submerged network of passages upstream of Dip Sump are at similar depths.

Perhaps more significant is the tightness of the submerged passages Josh describes. Whilst the phreatic tunnel of Dip Sump is quite generously proportioned and one can readily contemplate it accommodating a substantial flow, what is described here is quite different. It is very easy to see this section of the cave as being a 'pinch point' restricting the flow and causing water to back-up in flood conditions. It is little wonder that we witness rapid and dramatic changes in Boulder Chamber and Upper Flood Passage when stream levels rise.

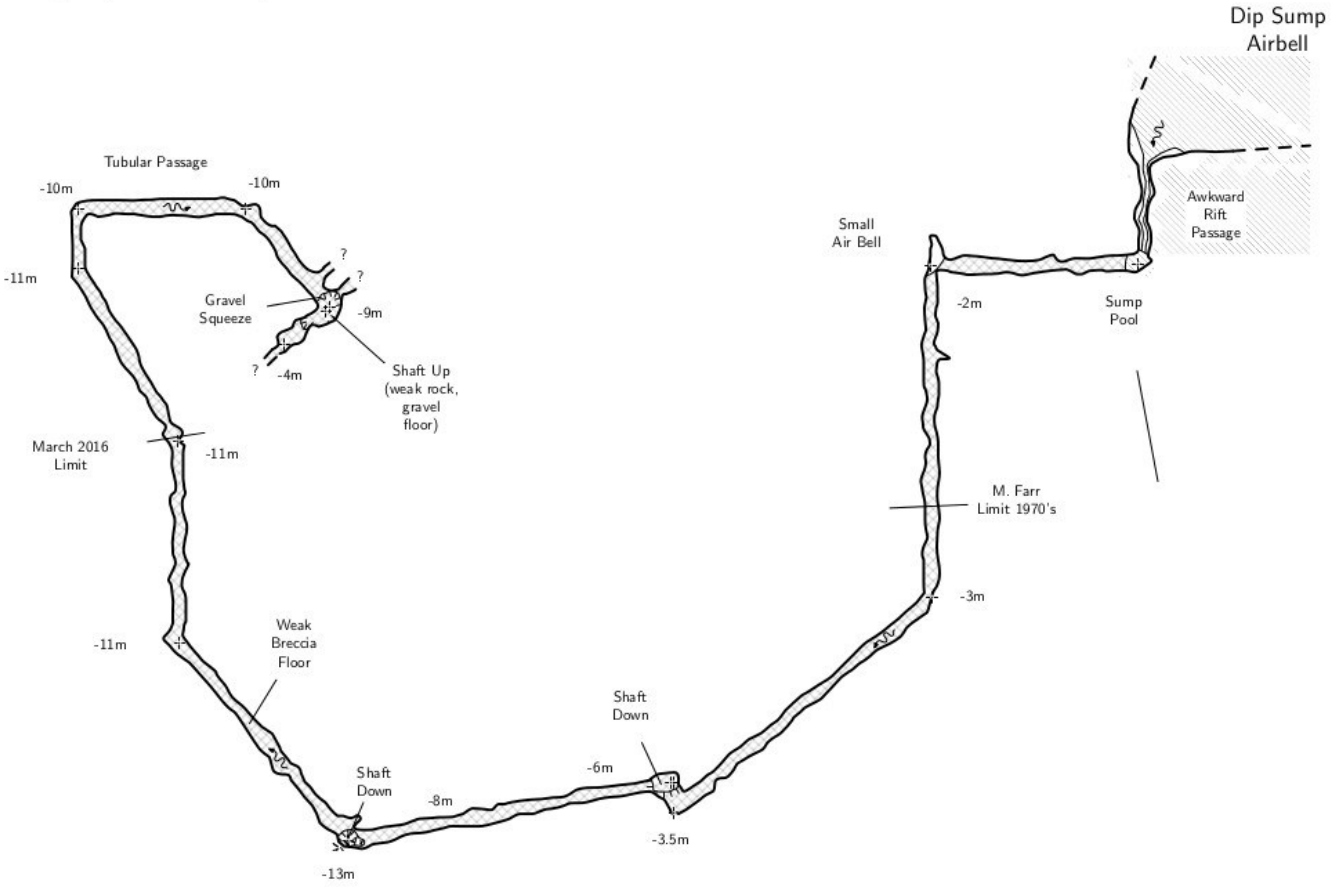
Acknowledgements

Many thanks to Josh Bratchley and Adrian Hall, CDG Editor, for permission to use both the extracts above and to re-print the surveys on the following pages. Further thanks are due to Adrian for taking the trouble to supply me with the surveys in a number of different file formats. This support is much appreciated.

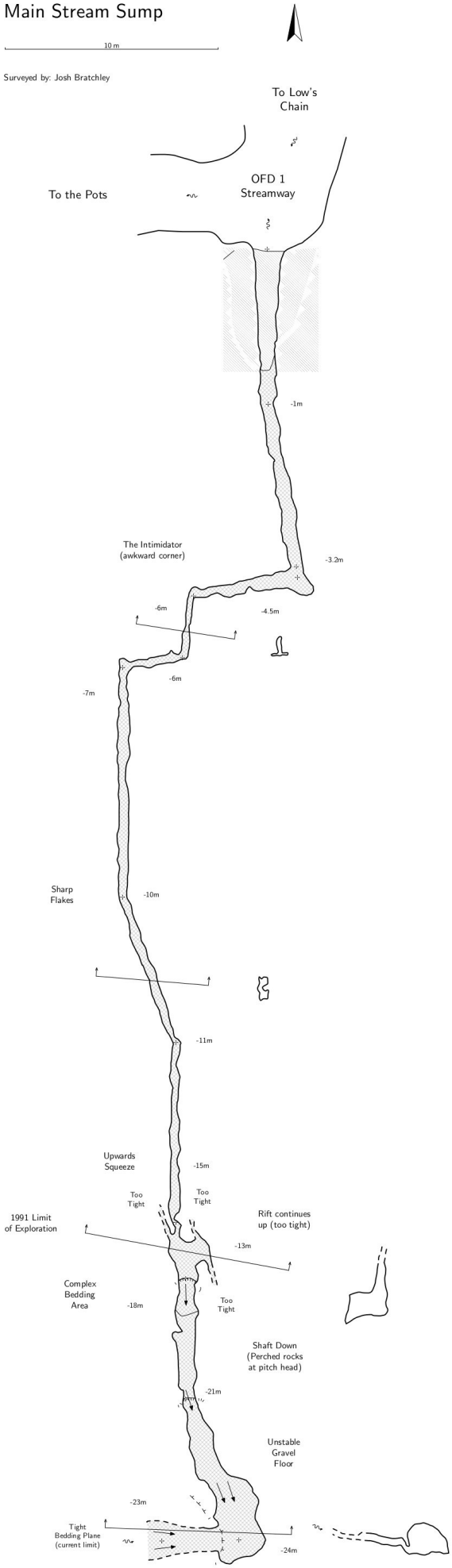
Downstream Dip

10 m

Surveyed by: Josh Bratchley



Main Stream Sump



Some thoughts and reminiscences about 'Flash Flooding'

Bob Hall

When I first began to visit Penwyllt, back around 1965, Clive Jones was an irrepressible 'character' and a source of endless ideas and inspiration. Clive is probably best remembered as a 'digger', but he was a scientist too. At that time, he worked as an industrial chemist for Midland Silicones and of course silicones are often employed for their hydrophobic qualities: that is, they are not easily 'wetted', so repel water. It was therefore natural for Clive to apply his scientist's mind to trying to explain what natural processes might be behind 'flash flooding'.

He published a brief account of his thoughts in NL52. In that piece Clive defined flash flooding in the following terms.

> *"During prolonged, steady rainfall there appears to be periods when streams in certain areas flood rapidly and then fall. These floods are considerably heavier than can be attributed to normal run off and are flash floods."*

Clive then went on to develop a hypothesis to explain such a phenomenon.

> *"Flash floods could be associated with peat bogs. Peat is made up from millions of small fibres and these fibres are water repellent. This can be proved by drying out peat and then seeing how difficult it is to re-wet the fibres. Due to this water repellency the water in the peat is present as tiny globules and not as continuous medium. This means that the water is trapped in the peat and drainage rate is very slow. However a point is reached when there is sufficient water present to overcome the water repellency and the fibres are wetted. All the globules coalese, the water becomes a continuous medium and as soon as this happens the drainage rate increases rapidly. During drainage a point is reached when water repellency again takes over and the water becomes separate globules slowing down the drainage.*
>
> *"The important point is that the phase change points could be different in the two directions. If flooding starts at 95% water content in the peat and stops at 90%, a very large quantity of water can be released in a short period of time.*
>
> *"Light rain at a rate just above the drainage rate slowly brings the water content up to 95%, this causes a phase change and the water content drops rapidly to 90% giving rise to a flash flood."*

Clive is using arbitrary figures to illustrate his point of course; but put in other terms, what Clive is suggesting is that the 'threshold' at which water droplets coalesce so that water can flow easily through the peat matrix might be at the 95% saturation point, but the threshold at which water returns to being dispersed in droplet form might be at a lower point such as 90% saturation. The result being the rapid out-flow of 5% of the peat's water content. (After which the cycle would repeat if the rainfall remained constant.)

As a student in the period 1971/2 I was in need of a small study project and turned to Clive's hypothesis. In that era, long before digital data loggers, a field study was out of the question, although Pete Cardy offered the use of an ex WW2 gun camera which we contemplated using to photograph water levels at set intervals, but this concept never got off the ground. So, I was left wondering if I could simulate this postulated change in the hydraulic conductivity of peat in the laboratory.

With Bill Little's help and the loan of my father's car I collected a great many sacks of peat from the moor near Herbert's Quarry and this was transported to my college on the outskirts of London. Here it was packed into a wooden tank I had built, and my experiment could commence.

I manufactured a circular chart recorder using an old Venner time switch which was driven by a synchronous motor and, through gearing, rotated once in 24 hours. By a system of scraps of drainpipe and a float moving a pencil against the chart, the amount of water emerging from the tank could be logged. (See Figure 1. on the next page, my home-brew chart recorder is at the left.)

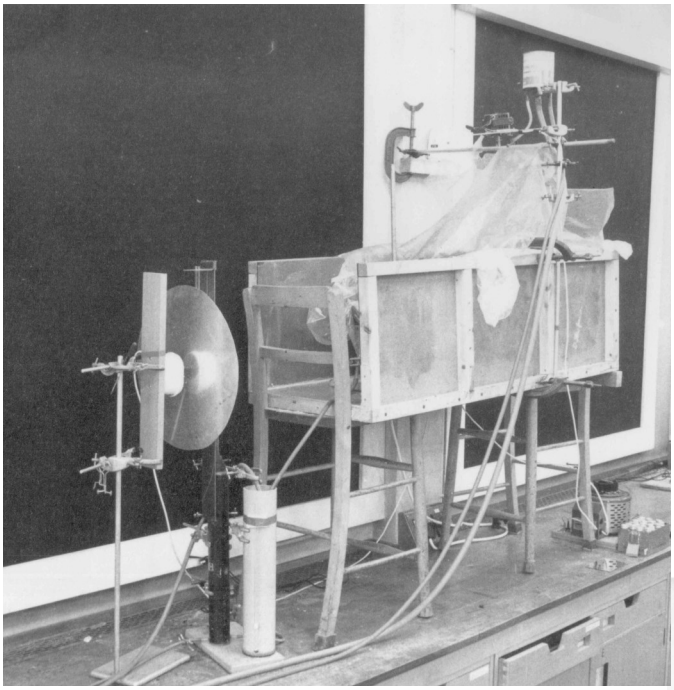


Figure 1. (left)
The float chamber and chart recorder are on the left with the wooden tank centre and the constant-head tank high on the right.

The supply of 'rain' was achieved by setting up a home-brewed constant-head tank with an outlet nozzle that dripped onto a rotating disc of plastic which made a fair job of sprinkling water evenly over the peat. The flow from the nozzle could be adjusted and measured using a measuring-cylinder and stopwatch. These details can be seen in Figure 2. below.

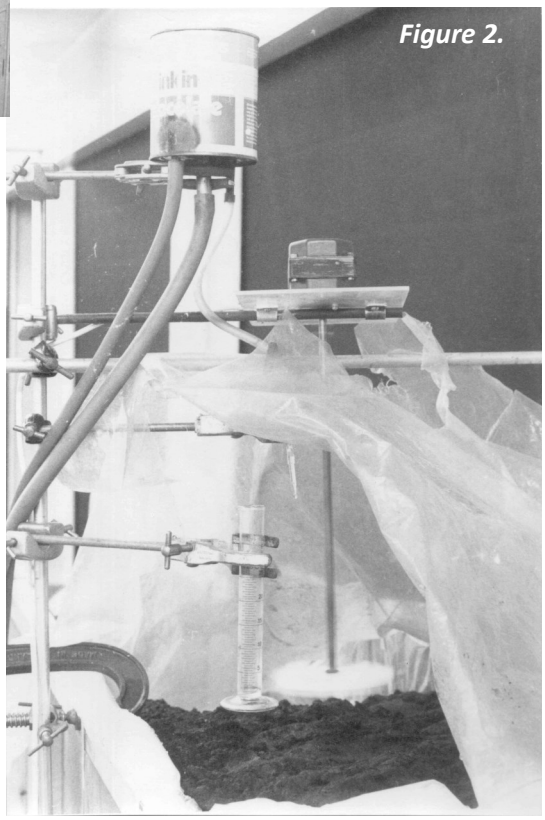


Figure 2.

This was all great fun and earned me a good grade – but the results were inconclusive, and I was never able to reproduce the sudden releases that Clive had speculated about.

Now, almost fifty years later, technology of the sort that Graham Christian describes elsewhere in this Newsletter is available and could readily be put to work. Furthermore, a very brief review of the literature suggests that studies of peat hydrology have advanced significantly in the last half-century and it is possible that data is already available that might confirm or refute Clive's speculations.

Perhaps a new generation of scientifically-minded members will settle this question once and for all.

Footnote.

It is highly probable that Bruce Foster was well aware of Clive's published article at the time he gave evidence at the Inquest on the deaths of David Gough and John Fitton, but Bruce is reported as using the term, "bog burst" in his testimony, although it is likely he was visualising a 'flash flood' of the type Clive describes, given the reference to "a super-saturated bog". (Page 14.)

In actual fact, a 'bog burst' is a very different phenomenon, somewhat akin to a mudslide as is clear from the following quotation:

> *In the early hours of the morning of 28th December, 1896, the Knocknageeha bog, situated at the head, of the Ownacree valley, seven miles N .N .E. of Headford, near Killarney burst, and discharged a fluid mass, which, pouring down the valley of the Ownacree, devastated the surrounding country in its course.*
>
> *A dry summer had been followed by a wet autumn, and about nightfall on December 27th, a heavy downpour of rain set in, accompanied by a south-easterly gale.* ***Somewhere between two and three o'clock the following morning the edge of the bog, which overlooks the Ownacree valley, gave way and liberated a vast flood of peat and water.***
>
> *(* http://www.from-ireland.net/bog-bursts-field-club-1897/*)*

The Appeal of Digging

David Eason

This brief anecdotal account is intended to describe the subject of digging in general to the uninformed and hopefully encourage those who have never been interested, or don't even know what goes on, to find out more. Digging is not without its controversies and can be a very personal subject; I'll keep this light hearted and will not delve into such matters. I'm also no expert, nor consider myself a full time "professional" digger; let's just say I'm a keen enthusiast finding the time for such pastimes when I can. Without the drive for discovering the unknown, we would be nowhere. Digging is an important part of the life of a caving club.

A bit of background

Although I have been fascinated by the Karst landscape of Wales since my school trips to Dan yr Ogof, and family walks around Porth yr Ogof and West Wales many years ago, those that know me well know I have only been caving-'proper' for about 6 years. It was perhaps these early experiences that intrigued me about these landscapes, their formation, history, and the notion of their drainage systems. For about the first four years of my caving career, and off and on since, I teamed up with an excellent group of Mendip cavers and diggers. Almost immediately I was involved and hooked with digging activities, and soon got to learn about the history, characters and places. It was apparent that, were it not for the sheer determination of the relatively few cave diggers (in all regions), not many caves would be open for all to enjoy. That being said, digging is an active but almost unknown club activity to many new members, yet there are many teams pursuing and actively discovering new cave, at home and abroad.

A few years back, I was given a copy of the Pengelly Trust "Studies in Speleology, vol. IV 1983" as a present. This text included an essay by the late Willie Stanton called "Digging for Mendip Caves". In this, Willie opens by stating how only "one eleventh of the cave passage on Mendip were accessible before 1900. Most of the remainder was discovered by digging", around the time of the late Herbert Balch, the pioneer of spelæological interest on Mendip. Willie goes on to quote the famous Mendip caver Fred Davies, stating that "caves be where you find 'em", despite the pundits and experts trying to predict the locations of elusive lost caves. I find a lot of truth in this statement that's proved correct time and time again. In the essay, Willie talks about tactics: where to dig, solving the problems and the challenges encountered, the dig psychology, and also the future of digging and the conservation issues involved. All diggers (and cavers for that matter) should be conscientious about cave conservation, and existing places should be respected and looked after for future generations: this is crucial. This was possibly the last thing people were considering back at the turn of the 20th century, as some of the damage in the most accessible Mendip caves discovered at that time will confirm. I would recommend that particular essay on digging to anyone interested in finding out more. There is a copy in the SWCC library. It certainly inspired me to get involved.

What's digging all about?

To vastly simplify things for those who've never considered digging before, nor even know what it involves, it essentially involves finding and opening long-buried or hidden cave passages, which may have remained hidden for a variety of reasons. Digging is also reopening and stabilising old mines, and passages within open caves that are elusive and choked. Conservation work should also be included here, such as cleaning away mud, taping formations and supporting scientific research work. It could also involve collaborating and cooperating with landowners to secure access and keep relationships with cavers healthy.

It is a game of chance and hard labour. You can go into all the science, detailed analysis, use the best techniques and get in the best experts on hand, and still it always seems to be luck, occasional bold moves and hard graft that gets results, whether you're in it for the long-term investment or you're more of a short-term opportunist. Some digs last decades, when others last weeks or

months, depending on the location, seasons and the challenges ahead. Before Top Entrance was opened from the inside in the late 60s, there was no hint of a cave passage beneath the surface. Following long, epic, adventurous trips, good intuition and radio location, opening up and stabilising Top Entrance was a relatively rapid process. On the downside, it could be argued that perhaps the then new, more easily accessible further reaches and enticing miles of passages meant the cave suffered in the process and was not best conserved. These are the dilemmas faced by diggers.

Choosing the site is also up for debate. It's perhaps good to look for obvious features on the surface, and then again perhaps not (within reason, of course!). Any site can yield results it would seem. Active sinks always pose the challenge of being continuously filled in every season, as well as being relatively immature, and boulder chokes contain multi-dimensional challenges of their own, be that technical or psychological. Scientific methods can be employed, such as ground resistivity, hydrology studies or radio location, and many trust in the humble dowsing rods.

The dig usually starts with a very enthusiastic team. After a few sessions, morale can wane, and commitment levels vary, and then when things start to look interesting, "diggers fever" takes over and the dig soon becomes incredibly exciting again, usually fraught with engineering challenges to solve. I would sometimes consider myself there to keep an eye on things for the professionals and stop them getting too carried away, perhaps a sort of "tech support"! It soon becomes an addictive and highly personal activity and there's nothing like finding spaces looking into long-lost, water-sculpted places, no matter how small they are. They're all breakthrough trips, no matter how small!

A small part of Tony Baker's digging team:
L to R Jem Rowland, Tony Baker, David Eason & Paul Quill.
Photograph: Carlo Ryan

Why do we do it?

I thought it would be a good idea to refer to the first three objectives of the club's constitution:

1. *The discovery, exploration and survey of caves,*
2. *Scientific study and research in caves and cave entrances,*
3. *The conservation of caves*

I think it's good to remind ourselves of these points. There would be no trips into Ogof Ffynnon Ddu if it wasn't for curiosity, interest and determined digging. It's also probably the one last true way of exploring places on this planet, apart from the deep oceans, that no-one else has been to, and provides a great sense of adventure (sometimes more so than others, of course, whether intended or not!).

Then there are the characters. I particularly enjoy the sheer determination and camaraderie of the team on a digging session. You can learn a great deal about a club and get to know its members and history through digging, yet also get a real insight into the story the landscape is telling you and get a better sense of understanding of the caves beneath. You get to be the first to see quite impossible and inexplicable sediment layers and perched boulders, among other interesting features. There is an enjoyable futility to trying to decipher all these things over a beer or two in the long common room, or 'down the pub' afterwards, let alone discussing engineering solutions to get beyond obstacles. A day on the mountains, or down on Mendip pushing the dig face with the camaraderie of the team is one of the best parts of caving, home or abroad, in my mind. The bad jokes take some getting used to, of course!

Another part of the appeal is to follow in the footsteps of some of the pioneers in exploration and get a sense of that tangible history. Great respect must be given to all, from all generations, who look for caves, push the dig face, support the team and strive to go into the unknown, no matter how small or large their commitment. This is especially true of the early pioneers who literally engineered equipment from diving systems to methods of scaling avens and pitches; many of them originated from the Mendip Exploration Society and went on to form SWCC itself. At this time, many friendships were formed between cavers and landowners alike, as Ogof Ffynnon Ddu and Dan yr Ogof were getting the attention of cavers.

More than anything else, the thing that keeps us going in South Wales is the reminder of the miles of lost caves that exist on our doorstep. There are vast catchment areas taking huge quantities of water, miles to the resurgences, very little discovered passages and literally massive limestone beds. It could be argued the easy "low hanging fruits" are essentially found. The elusive hidden caves require large effort and commitment but are suspected to be worth the effort. Then again, the lucky digger may stumble upon an easy straightforward buried cave entrance at any time on these hills.

Mendip Beginnings

When I first got involved on Mendip, it was really apparent how important digging is there, a core cultural aspect to many clubs. Relationships with landowners are generally good and respected. There may be a "dig fest" every few years, and occasionally all the clubs compete in usually beer-fuelled fun activities, such as the Wessex Challenge. Diggers and cavers from all generations seem to know much about the history of the clubs, characters and their digs.

I was a bit disheartened by some of the more futile attempts to stabilise places that didn't want to be stabilised. At one particular dig, we must have moved the same spoil countless times as it continued to collapse in each flood event! On Mendip, we generally have the luxuries of easy vehicle access, good landowner relationships and the use of readily available machines and materials, like stone-dust and cement. Any open space we found seemed huge and even a couple of feet was a big breakthrough as far as I was concerned.

On Mendip, huge effort is spent building stable entrances and stabilising boulder chokes, putting the hard work in for the long-term gains, securing the sites for future diggers and cavers. We used a sort of stone-dust grout, along with choice, large boulders to create stable stone shoring rather than scaffolding that will, of course, essentially rot over time. There is a real art to this cement stabilisation work. The cement also provides an indication of whether things are moving. It's quite incredible how much material can be consumed by a boulder choke. To look at inspiring examples of digging engineering to the extreme, check out Templeton Pot, or some classic examples of Willie Stanton-stabilised vertical boulder chokes, such as those in Reservoir Hole and Waterwheel Swallet. In the latter, troughing and pipework are engineered and hidden, to catch drips and wash formations, and walls have been constructed with viewing windows into grottoes, as the penultimate in conservation tactics. The ultimate tactic is to not find it in the first place of course, or to block it up and keep it hidden!

Some other notable experiences digging down on Mendip have involved engineering ventilation in digs with bad air by carrying generators, fans and pipework to sites, installing water pipes and valves to divert entire stream inlets, or using electric winches and generators to lift out spoil. High CO2 has become a real problem in many Mendip caves in recent years. Effort has been spent providing remedial work to previously dug and unstable entrances, using large plastic pipes and backfill, to avoid the need to shore up a shaft with complex scaffolding. I spent time helping build numerous entrances in streamways, which involved a degree of building dams, sluices and diverting streams, as well as pumping out perched pools to dig downwards. It was all great fun & satisfying work.

There are also less-glamorous moments, such as digging into the cave that was potentially previously used as a Georgian latrine, with stone-built culverts routed into the entrance, or pulling out quarry-machine tyres and dead animals from one particular site; both equally 'refreshing'!

South Wales antics

The easy access and material usage found on Mendip are not luxuries available to the mountain diggers in South Wales, which means that minimal equipment must be carried for miles onto the hills. When I joined SWCC in 2017, I was introduced to Jem Rowland, and after a few beers and discussions, the idea of finding "caverns measureless to man" was too appealing, so I signed myself up to helping out Tony Baker's team. During the hot summer of 2018, a team of us carried 12 foot steel scaffolding poles and boards up a mountain for about 4 miles! This was much to the amusement of the passing Duke of Edinburgh group that told Paul Quill to "get a lightweight tent", or as on another occasion, when quizzed on what the boards were for, Paul kindly told them "for stepping over the puddles"!

Jem told me how, in hindsight, they probably took the easy access with a Land Rover for granted back in the 1970s, and more focused digging could have been done. Peter Harvey had a theory, after the opening of Top Entrance, that a few hours spent at many chosen sites would yield passage sooner or later; probably quite a sensible and efficient approach at the time. The physical opening of Top Entrance was a relatively quick process, but it was the result of immense effort and decades of pioneering diving, digging, epic trips and radio location.

The author, precariously sawing timber shoring somewhere on the mountains.
Photo by Martin Hoff

A memorable moment digging on the mountains was when the dig decided to throw rocks at us, on that same hot day that we lugged tons of kit up the hill; huge roof blocks came down which Quill managed to deflect! Then Quill told me the story of rogue boulders coming down pitches in other digs, and boulders as big as estate cars moving in other Black Mountain digs. I also heard about the occasion when Steve West literally brought the roof down! There was an occasion when Jem was stacking rocks behind scaffold shoring when Carlo was "passing" the rocks down. The way I recall this, it was more like Carlo telling us a joke and simultaneously throwing rocks down at an unwary Jem! But when everyone's in position, and the team is well-synchronised, tremendous amounts of

spoil are removed from the dig in no time at all. It can be a bit disconcerting when there is a constant rain of small lumps dropping on you from a roof that you're not quite sure is rock - or is it just gravel and clay?

The weather is also a key feature of the mountain digs. We have been on the hills in all seasons, quite literally, from the hottest days to the wettest, coldest, bleakest days, but it is still a fantastic place to visit.

A cold and bleak day on the mountains with a solid frozen river.
Photograph: David Eason

There are still many digging teams and individuals across all the caving regions that are massively dedicated. SWCC certainly has several active teams, home and abroad. Just look in recent club newsletters and see for yourself. There have recently been stories on the diving experiences of Gareth Davies and team in Mexico, Andrew Ward's reports of digging in the 'Cotswold Massif Central', and Tarquin's account (in this issue) of some very determined digging in Town Drain Cave as well as an update from Phil Knight on Ogof Marros, also in this issue. The Llethryd team, compromising Andy and Antonia Freem and Peter Kokelaar, are working hard to reopen a lost but scientifically important cave on Gower. That particular dig is so far looking very interesting; an immense effort has already been spent in a relatively short time to open up a reasonable length of passageway that is ongoing.

It is safe to say that the club has been, and continues to be, a very active exploration organisation, both past and present, as well as a social, scientific & sporting club.

Moving Forward

As times have changed, and continue to change, so have techniques, technology and especially awareness for conservation and cooperation. The latter points are particularly poignant in such nationally turbulent political times. Recent scientific discoveries are starting to open new chapters in the stories of cave and subsequent landform development, (almost more so in the UK than other countries in some respects, as the evidence was not recognised until very recently), and we are

starting to learn that these places are more than we thought, or more than they seem. This hands great responsibility to cavers and diggers alike to respect and look after these fragile places for future generations, and to educate and inform individuals new to caves and caving on the importance of conservation. Remember, these places have evidence of landforms and periods of history that literally do not have any surviving evidence anywhere else, and it's all there for us to stomp past when we are doing the classic trips. We are all ambassadors for the club and cavers generally, and so it's up to us to set the example and put something back, be that in educating and encouraging new members, raising awareness of the important issues, or getting involved in one of the myriad of other ways (perhaps in exploration, providing engineering support, lugging kit, surveying & cave science). Lightweight cordless drills, bolts, climbing gear, better lighting and so on have made otherwise inaccessible places now feasible to get to with less effort than in previous decades; the humble cordless SDS drill replaces a generator, compressor and air drill, and modern bolting and aid climbing kit allow avens to be more easily accessed.

There are miles of awesome passages and places waiting to be discovered all over the world, especially right on our doorstep. There is then a lifetime's work surveying, understanding and sharing the places and your experiences with others, following in the footsteps of those before. Is that not enough to want to get involved?!

Paul Quill illustrating the utter joy of digging!
Photograph: Carlo Ryan

Ogof Marros - The Story So Far

Phil Knight
All photographs are the author's

The breakthrough of 2015 was a momentous affair, and the prospects of the newly found river passage giving access to the theorized master system were high, until we found the choke. The river was pouring through the choke with very little sign of sumping. The choke is a crumbly intersection where older passages have been undercut by new passages. The older passage, known as Three Tier Rift, is now abandoned by the water in favor of the lower, larger and squarer river passage. Both Three Tier Rift and the river passage terminate in the choke. The choke in Three Tier is composed of cemented and rounded rocks whilst the initial choke in the main river passage is of fallen broken boulders. Past the main river choke are muddy rounded boulders after a section of bedrock and then more failed boulders and general chaos in the other. The choke was pushed. Dig one hit the water and a wall of bedrock. Whether we have bedrock is debatable; I think bedrock, others, big settled boulders. The whole area seems to have pockets of heavily dissolved rock where joints have been widened and gravity has taken over. Dig one would require effort and we had a lot of choices before us. Next was dig two. This led to a rift of solid rock and then a mud rock choke. We found a way down to a chamber in boulders. Not a very nice place at all. We then pushed south and used the chamber as a spoil dump. This push got very hairy and was eventually abandoned in favour of high level passages in Three Tier Rift. We found a wall along the choke and gave that a push. This eventually opened up to a chamber composed of two large settled blocks that could accommodate three people. We again pushed onward and unfortunately Andy Freem was nearly squigged by a boulder in a rubble chamber. Luckily we had just put in some scaffolding and I believe that saved him. Also, long before this incident, and the first caving trip after I found out my misses was up the duff was an eventful one; I was about to enter the rubble chamber to do some work and a large rounded rock peeled out of the roof onto my head. I dare say that the chamber was telling us to go the other way. The team up to now was the Freems, Claire, Duncan, Colin, Gareth, Ash, Michael with a stream of one-dayers. Michael produced the survey shown in Figure 2. overleaf.

There was one more dig effort before the team drifted apart. This was located in the main choke between dig one and two and was identified as having potential from a tiny hole in the boulders. Andy soon sorted that out and we had a new way on. Interestingly, we had found the base of a rift identified in Dig 2. This dig, known as the Sharks Cage, ended in boulders with glimpses of the stream below. It was a few months until attention was paid to a possible lead at the upstream side of the choke and it wasn't until I met Dickon Morris that we pushed the lead. We were following a rift but alas, it was found to be heading back to the choke after many digging sessions and some assistance from cave diver Gareth (not to dive but to chemically alter stubborn rock).

My first trip with Dickon: I gave him the tour and when, at the Sharks Cage he posted himself into the boulders, I thought the guy was a lunatic. He then got stuck and had to hand me his helmet to get out. I saw concern in his eyes and that gave me comfort that he wasn't going to get himself too killed by foolish actions.

Fig 1. Dickon in the Sharks Cage

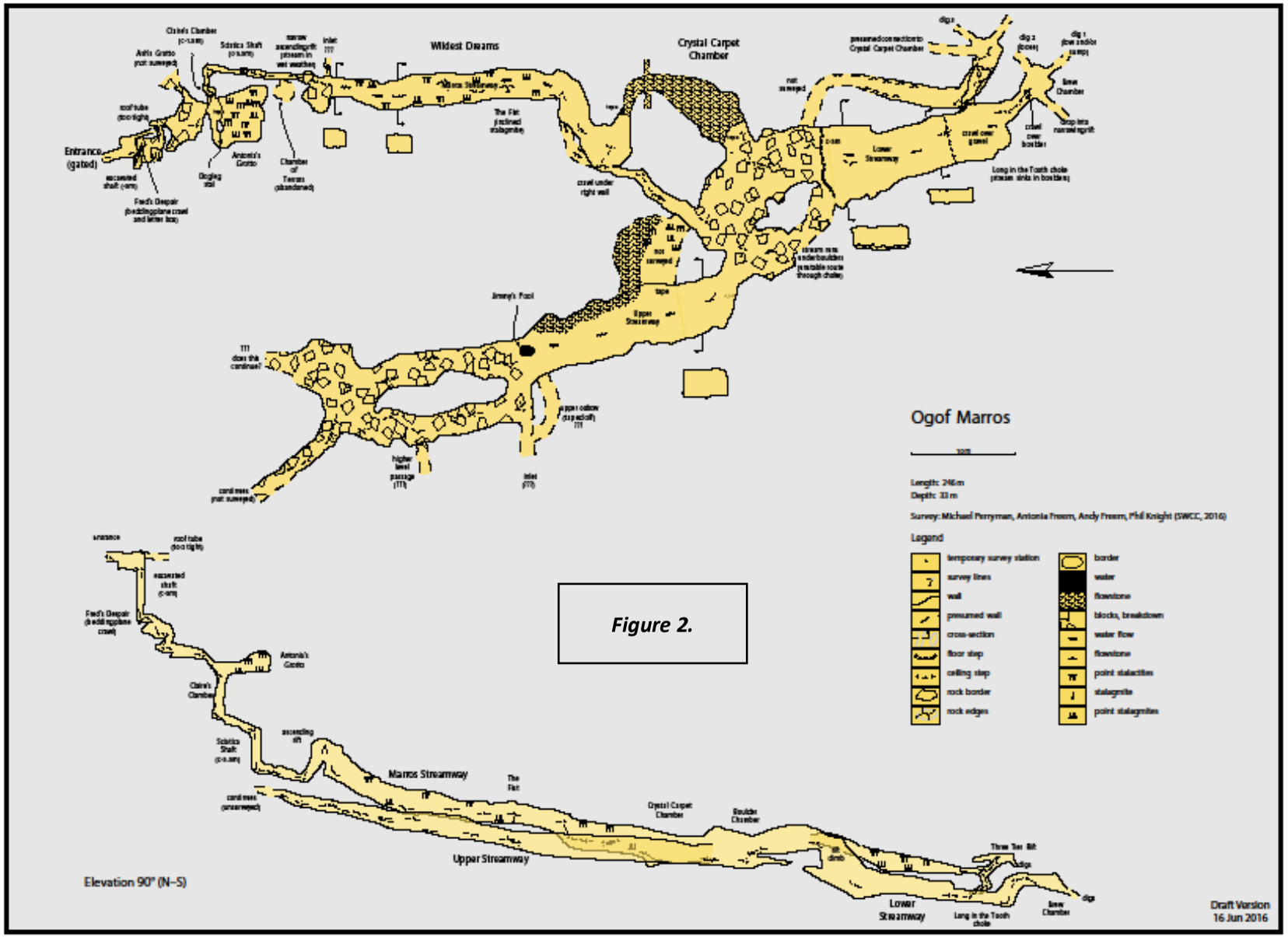
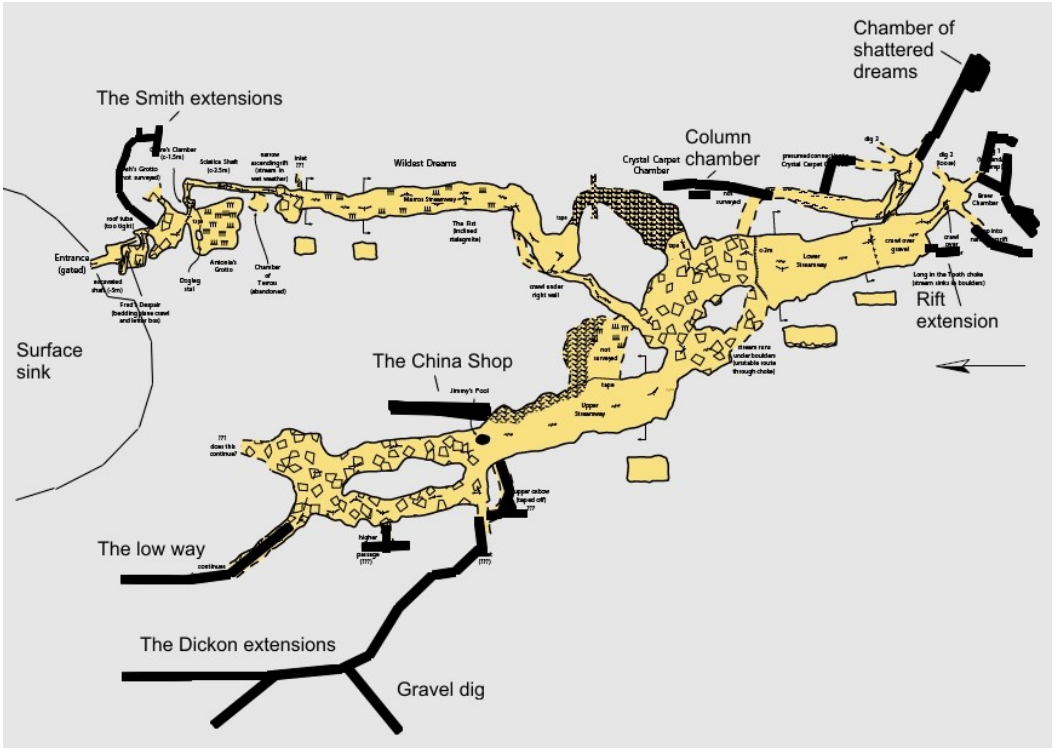

Ogof Marros
Wildest Dreams
Crystal Carpet Chamber
Entrance (gated)
Marros Streamway
The Flat
Upper Streamway
Lower Streamway
Crystal Carpet Chamber
Boulder Chamber
Long in the Tooth choke
Length: 246m
Depth: 33 m
Survey: Michael Perryman, Antonia Fraser, Andy Fraser, Phil Knight (SWCC, 2016)
Legend
temporary survey station
survey lines
wall
presumed wall
cross-section
floor step
ceiling step
rock border
rock edges
border
water
flowstone
blocks, breakdown
water flow
flowstone
point stalactites
stalagmite
point stalagmites
Elevation 90° (N–S)
Draft Version
16 Jun 2016

Figure 2.

Months later there was another event. I was working the upstream choke rift alone, drilling into holes that had unexploded caps in (never a good idea and quite shocking when they go pop. Live and learn.), when Dickon returned and told tales of stand up passage upstream. Baffled I went to see what he meant and by crikey he had found around 100 m of inlet past a constriction that no one except him had dared to push. We explored it and found a crumbly side chamber and a gravel-filled strike passage. This passage was on a corner where one could hypothesise that it used to be the main route before the main cave hijacked it and could therefore be a blocked way on that could bypass the choke. Tarquin of Draenen joined us on occasion and is shown below in Figure 3 admiring Wildest Dreams.

Fig 3. Tarquin admiring 'Wildest Dreams'

We began to dig out the passage, months passed and it came to nothing and we were back to square one. See the very rough survey in figure 4., below.



Our attentions were again turned to the rubble chamber. A trip with Claire and Duncan saw the removal of a key rock in Dig 1 that gave fresh hope in following the water. Claire put us all to shame in the removal of some choice lumps of rock in very confined quarters. Later trips with Dickon, and later joined by Tarquin, found us following the water to another tiny chamber with polished rock, possibly solid walls and roof and the water falling through the floor.
One amusing occurrence saw the firing pin (used for capping) becoming stuck in a stubborn rock and the resulting pounding of the rock to free the pin resulted in the rock splitting clean in half along a bedding line. We were then able to bring out the rock and batter it to bits to remove the pin as seen in figures 5 and 6 below.

Figure 5, above. The stuck firing pin

Figure 6, right. Firing pin embedded In the rock.

The water is seemingly heading off to the Sharks Cage. We are now carrying out a new survey to see where we stand as portrayed in figure 7.

Our options are slowly but surely becoming focused on one dig and time will tell if we ever find the master system.

Figure 7, below. Surveying in the choke

Town Drain, Love Handles and Gender Fluid

Tarquin Wilton-Jones

All photographs are the author's.

I wasn't looking for a dig.

Summer 2018 had been really dry. I had dragged my daughter down the Nedd Fechan in August, to visit a set of caves that I had ignored for the last couple of decades. Pwll-y-Rhyd, White Lady Cave, and Town Drain. The last one we visited was Town Drain, so named because of the drastic and complete flooding that happens whenever the river flash floods, sumping the cave completely all the way back to the entrance. Under normal conditions, three small inlets produce a very small stream for the second half of the cave, leaving the first half dry.

Following the guidebook, we explored all of the oxbows, the main side passage, and the main passage to the end, described as "getting smaller to end at a mud and stone choke". Sure enough, the end got smaller below a dry waterfall, twisted and turned a few times, then ended at an obvious mud and stone choke. Or at least it looked like it until I lay down on the floor and squirmed below the final arch. In front of me, the ceiling lifted again, and through a tight tube, I could see into open passage. The tube was too tight for me to contemplate pushing through without the assistance of other experienced cavers, but, clearly, this was not ending the way it had been expected to. Beyond the tube, I could see a narrow rift which might be wide enough for a human. The 1988 UBSS survey didn't seem to show this area properly, having just a single kink to the right, with the ongoing passage being shown as very small, heading into the unknown.

We returned to daylight and I solo caved into Ogof Igam-Ogam, through the canals to sump 4, to meet up with Gareth Davies and Malcolm Stewart, who were pushing leads. While hauling out their diving kit, I asked Gareth if he wanted some free cave, which could prove much easier to get into than their Igam-Ogam prospects. Gareth confirmed that the end I had visited was the end that he knew, and that I had probably seen into virgin passage. I sold it to him as a prospect that I might have been able to push through without digging, if I had been a little less cautious. He bought it as a possible way to allow dry cavers to get into Little Neath River Cave's New World Series, bypassing three divers-only sumps. That way, we could help carry diving kit in there in order to push other leads...

Below: Gareth breaking through

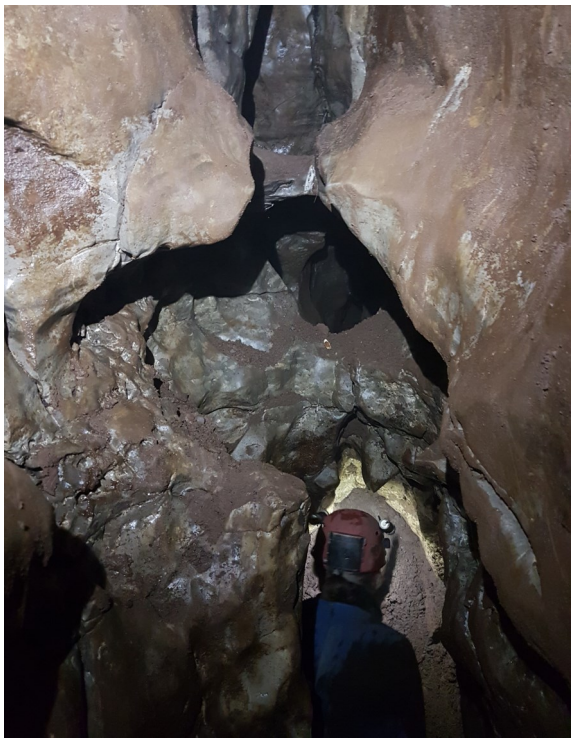
The two of us returned soon afterwards, on 6th August 2018, with some digging tools. As it turned out, some digging was required to enlarge the floor of the squeeze, both before and after the tightest point. My enthusiasm for squeezes is fairly low, so I was rather happy to let Gareth take the first stab at it. A vertical slot curving upwards at 45 degrees, exactly the same size as a human. Reversing looked as crazy as going headfirst. Gareth pushed it without a helmet or oversuit, and made some very happy noises about standing in a larger area, with a rift continuing ahead. He explored the first few metres before saying that it was my turn. He dug out a lot of the floor, then slowly edged back out through the squeeze, and I pushed through with an oversuit but no helmet.

The breakthrough opened into an enlargement big enough to stand a couple of people in, with a blind rift heading back over the way in, and a rift continuing ahead over a series of rock bridges.

The way on immediately dropped down a couple of metres, with the lip of that drop making a very effective little dam wall. The floor of the enlargement was a pile of river debris; rocks, mud and branches. Clearly the water had been flowing in, blasting through all of the mud and rocks, then allowing them to normally slump back to fill the squeeze whenever the flood ended, creating a plug. The unusually dry weather had opened it up for once.

The ongoing rift quickly lowered to a narrow tube, barely wide enough to wriggle along, and pushing it was less than comfortable. It seemed to end a few metres ahead at complete mud fill. I called Gareth through, along with our digging tools, emergency food and drink (in case the squeeze blocked us in). Gareth was less concerned by the size of the tube, and pushed ahead to the end that we could see. Instead of ending, it turned a corner and dropped down an 8 foot (2.4 m) cliff of mud and cobbles, into a walking sized passage! The walls were very slippery, with no obvious holds, so we would have to return with some vertical equipment. I took a quick look, and decided that I could probably chimney back up, using a sloping wall as a foothold. So rather than wait, I dropped carefully down, into the ongoing passage. Amazingly, there was a large plastic oil container partially buried in the floor - the floods must have forced it through the squeeze!

Above: Virgin Passage



Right: The Rift after the breakthtough

Up ahead, the passage quickly lowered to a crawl, swung a couple of corners, under a rock bridge, then lowered to a low squeeze. I could see into open passage, but tiredness took over, and rather than push through, we decided we had had our fun for the day. We were 25 m from the breakthrough dig. The 8 foot drop proved relatively easy on the way out, swinging feet up to roof level, then posting yourself through the letterbox at the top. On our way out, I forgot to remove my helmet at the breakthrough squeeze and proved that it was possible to get through with it on, even if it looked impossible at first. We named the new extension Love Handles, in reference to the build of cavers who would not be able to get into it.

The major problem was that we were near the end of summer, the floods would return soon, and the dig would block itself again. If we could remove the lip of the drop that held back the mud at the breakthrough, maybe the flow would keep the dig open instead. So, for our next trip, rather than pushing the end, we took some additional supplies, and spent some hours preparing to use modern rock removal techniques to remove the wall of the dam. This was controlled from about 70m away, but due to the perfectly shaped passages, the sound carried well enough to shake the dust off the walls.

Before we could return, the long-awaited rains came.

On our next visit on 17th August, things had changed for the worse. The breakthrough was no longer visible, replaced instead by a duck with only a couple of inches of airspace. The rock may have been removed, but it had left the passage with a rubble pile which still blocked the outflow. Surely it would be best to let it dry out then push through another day. Gareth's disappointment got the better of him, and he decided to push it. Treating it as a sump, he dived into the squeeze, which thankfully climbed above the water. Finding it open, he continued into the passage. Some rock removal later and the pool largely drained, allowing Pete Bolt - the newest member of the team - to join him. The dam wall had been sitting on a mud plug, so Pete dug the drainage channel a little deeper into the mud, removing the pool completely, and allowing me to crawl through in dry comfort.

Pete Bolt at the breakthough

We pushed ahead to the furthest point, and this time I pushed onwards into the next 5 m of crawl, adorned with a wooden board and an old rope. This ended at a low squeeze, where I again pushed through into another 5 m. This time, the ceiling lowered progressively to a much lower arch, with a pool nearly touching the ceiling. The way on looked like a serious dig.

We congratulated ourselves. Our extension was 36 m long, and assuming we started at the end of the old survey, we would now have closed the gap between the caves by a third.

Just before the end of August, a much more serious flood hit. The cave flooded to the roof all the way to the entrance, and with a 26 m head of water, our improved flow made some big changes. The breakthrough crawl had enlarged, the wriggle was now a keyhole where you could crawl in the trench, and the 8 foot drop had been reduced to just a 4 foot drop. The end dig had opened up to allow us to fit more easily, and a couple of digs later, we could see below a rock flake into open passage on 5th September. Getting into it would require forcing gravel out of the way through to make it a duck. We discovered the remains of a wellington boot washed into the dig, which thankfully had no foot in it.

Pete Bolt below 'No-Foot Drop'

To prevent the soil and shingle from the earlier passage refilling it, we planned to start building a retaining wall at the 4 foot drop. Before our next trip though, a huge flood hit, with the river levels setting a new record. The water had ripped out the floor of the keyhole, making it now walking size. The 4 foot drop had been converted to a No-Foot Drop, which became its name, also referencing the wellington boot. The floor had been washed into the dig, filling our crawls until they were too tight squeezes and ducks. It took two trips, with assistance from Michał Poręba, to remove the tonnes of gravel, which was bagged, and turned into a retaining wall at the No-Foot Drop. The rock bridge was removed to prevent it from becoming another natural dam. One of the digs was spent repeatedly lying in a squeeze-sized duck, reaching forward, and dragging armfuls of gravel back through it, until it became large enough to fit through.

We were back to the second exploration limit, with another few metres of gravel to go to reach the end we had seen. But then Storm Calum loomed on the radar, and we considered other tactics. Instead, repelling the most harmful branches and rocks before they could make their way into the cave seemed better. Rather than little floods, allowing only the biggest floods might help, so that they were more likely to blast silt through, rather than clogging the passage with it. As an active flood drain, nothing can be considered permanent, and changes are natural. But maybe we could ask it to work with us rather than against us.

Above: Michał with bags

Storm Calum set new records. For nearly 48 hours, the river ran higher than it had ever been before. Even while the flood was receding, White Lady Cave had only a small airspace, and the river below was a raging nightmare. Town Drain's entrances were under 2 m of water. The dig had spent nearly 3 days some 26 m below water level. During the flood, many tonnes of river gravel had been washed over the lip of the filter, blocking some of the entrances with a 1.5 m wall of muck. A lot of the remainder was transferred into bags, used to try to prevent more being washed into the cave.

We announced our discovery and tied our resurvey of the last part of the passage and the extension into the old survey data, which came from 1969. Something was not right. The data showed that - aside from some small errors in the 1969 survey - the end was not where we had thought. The single kink on the old survey matched the location of the final corners before our breakthrough dig, and the final leg which ended at a "silted sump" matched the position of the No-Foot Drop. But most importantly, the floor through the last section of passage was 3 m (!) lower in 1969. So, the entire floor had risen by 3 m, restricting cavers to following a small, winding roof tube, and prematurely ending the passage.

Our breakthrough was not virgin passage at all, but a reopening of the way into the old passage. Everything beyond the No-Foot Drop must be new though. Except the Croydon Caving Club then said that they had "got into that stuff" in the 1970s, but it kept silting itself back up. Exactly how far

they got is not known, but it might be that they reopened the way to the 1969 end, or it could be that they reached our current end. Either we had found 17 m of new passage, or zero.

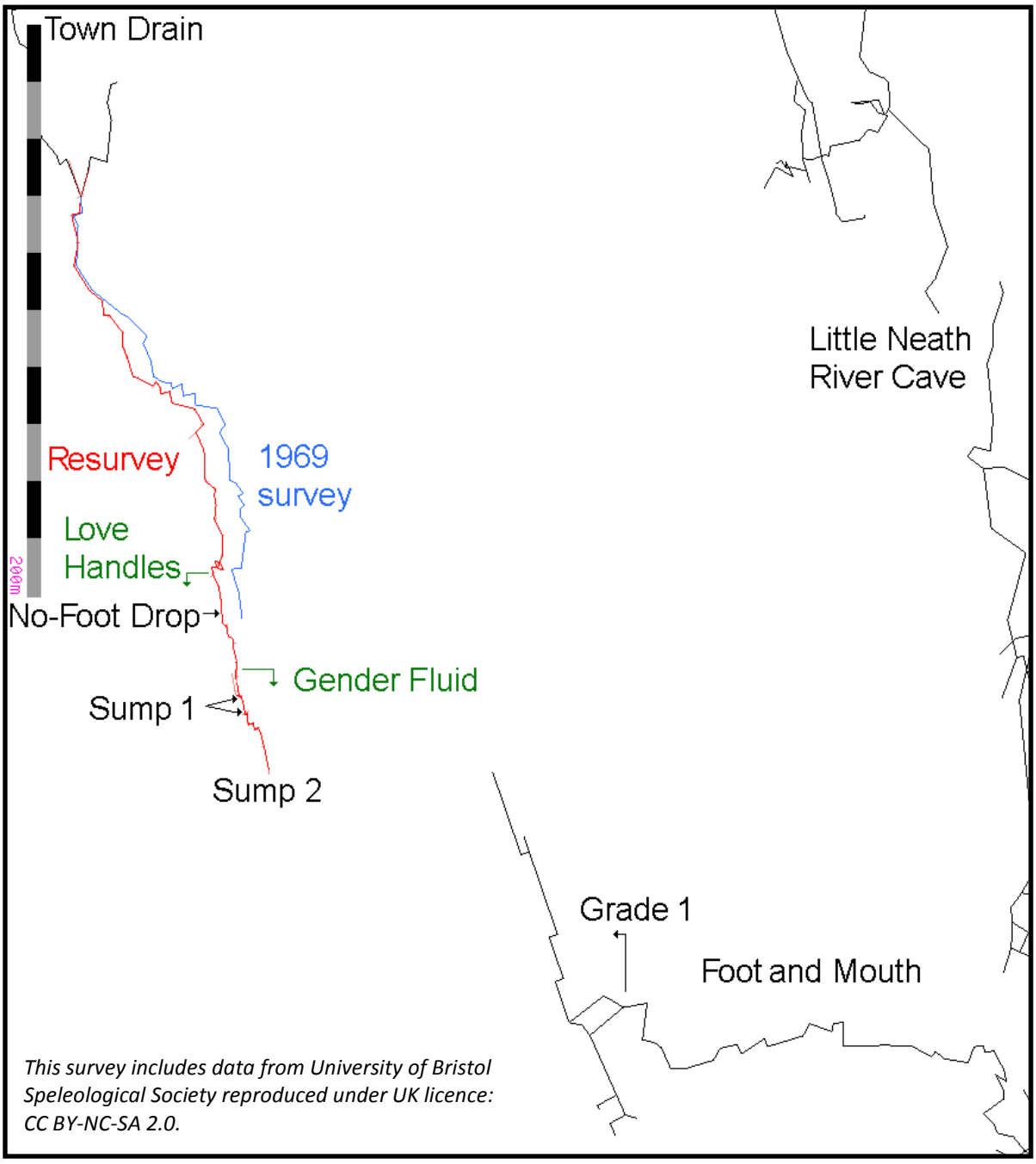
It was the end of May 2019 before we returned. The winter floods had washed some of the protection into the cave, but the results had been good; the final dig was reached without much effort, and it had opened up enough to allow us to reach our old limit. Over half a tonne of gravel was moved into bags back at the dry waterfall before the original breakthrough, where the river had been scouring out the floor. In June, we once again used persuasion to alter the end, lifting the low ceiling and removing the final flake, with Gareth spending a couple of hours drilling in a space so small that the drill bit had to be inserted into the holes before connecting the drill. This time, the wind could be seen and felt 45 m back along the passage. I was then away on a lengthy business trip but told the team to push onwards. I missed the breakthrough.

On 9th June, Gareth, Pete and Malcolm got through into the passage I had seen. After 10 m it reached Sump 1. A climb above had a narrow passage to a draughting aven, and a crawling bypass to a climb down to the far side of the sump. A crawl onwards reached a winding crawl to an enlargement, and 15 m of stooping passage later, they reached Sump 2. The aven proved very tight but felt like it might become a bypass to the final sump. They estimated 26 m and were certain that, this time, it was definitely virgin passage.

Adrian Paniwnyk beyond Sump 1.

A week later, they went back to push, but the cave had flooded and blocked the breakthrough. This was getting tiresome.

After my return in July, Gareth, Adrian Paniwnyk and I dug the breakthrough open again. Sump 1 was now just gravel. After proving the aven to be a useless, narrow rift heading back upstream, we reopened the first crawl after the bypass, which was now a painfully tight squeeze. Lacking stacking space, our digging to reopen it cannot last forever. The crawl beyond waited for another trip with Gareth. We took it in turns to open the still "snug" squeezes beyond, each of which had silted badly, to reach and survey the end, where Sump 2 was also just gravel. In honour of Pride month, the new extension - which turned out to be 50 m long - was called Gender Fluid, since it had not decided if it wanted to be a hole or not.



Survey showing Town Drain Cave in relation to parts of Little Neath River Cave.
The portion in red surveyed by Gareth Davies, Tarquin Wilton-Jones and Pete Bolt .

Our main concern now was trying to prevent the passage from silting itself back up due to the constricted sumps. Gareth and Huw Jones rigged some persuasion into the roof of the former Sump 2, with the guest expressing a particular dislike for the dimensions of the digs. We intended to check the results on the next trip. However, Murphy had other plans. With two of us forgetting equipment, two malfunctioning lights, and in the shadow of recent rains with an unknown flooding pattern, I abandoned the trip. The final nail in the coffin was when the draught that we were sure we had previously felt had failed to clear the fumes after several days. Sometimes the daemons are trying to tell you something.

George with rock

Gareth, George Linane and I returned to check the results. We removed over half a tonne of rocks, stacking them in the largest passage that had been found just before the former sump. Increasingly large gaps revealed that the former sump had been 3 m long, now blocked by a 1.5 m long boulder which was once the ceiling. Around the edges of the boulder, we could see 4 m of open, crawling sized passage, until the ceiling dipped downwards and blocked the view. The boulder would need to be split up before further progress could be made, but at least it now allowed the water to flow around it. 3rd August, open passage sighted. In a last effort, we then rigged up the ceiling of Sump 1 the same way, hoping maybe that it also might be an open passageway with the ceiling dipping at its start and end. Officially, it is summer still, but digging season is nearly over. The follow-up trips got called off by yet more rain, this time severe enough to make the river reach well into flood levels.

The extension is still heading towards Foot and Mouth Passage in Little Neath River Cave. Previous dye traces from 50 years ago ended up with the water joining the New World Series via some other inlets - likely because the water at the end of Foot and Mouth divides into separate flows. The passages share the same gradient, and we like to think that they are therefore likely to connect. So far, only a few divers have been to the end of Foot and Mouth Passage, and surveyed it to Grade 1, so we cannot be sure how much more passage needs to be found before we will connect to it. The end of our survey is roughly parallel with the Grade 1 end of Foot and Mouth Passage but offset sideways by 80 metres. How much can you trust a Grade 1 survey anyway, especially when it was drawn based on the bearing of "pointing towards Town Drain"?

This has been a lengthy discussion, and sometimes an argument, with the river; each time there is a flood, we question whether this time it has helped us, or undone our progress. Open passage has been seen though, now we just need the floods to play nice so that we can reach it. If there is a connection, it could be just around the next corner, or it could be the same distance again. Once again though, the extension has been closed off by gravel washed in by the most recent flooding, and it needs to be dug back open.

We battle on.

The Verneau Traverse

Tony Baker

The primary objective for the summer 2019 SWCC trip to the Jura was the area's longest and finest through-trip, the Verneau traverse. This is an 8.5 km through-trip, from the Gouffre des Biefs-Boussets near Déservillers to the Grotte Baudin, above the village of Nans-sous-Sainte-Anne.

This was a return visit for SWCC, with many of this year's participants having been to the area (and the same campsite) in 2005. The Verneau through-trips that year encountered an area of unpleasant pollution in the middle section of the traverse, which spoiled the enjoyment of the trip somewhat, but we had the notion that this incident was a rare occurrence and hopes were high that we could enjoy the full splendour of the traverse this time round.

The first task for any potential traverse of the cave is to rig both ends of the system in preparation, so with most of us on the campsite by the end of Saturday 27th July, a Baudin rigging trip was planned for Sunday 28th.

In the weeks leading up to our visit, France had been experiencing a serious heatwave, but this came to an abrupt end immediately prior to our arrival and the weather properly 'broke' on the Saturday night. Sunday dawned to heavy rain that didn't let up all day. Fortunately, while the streamway would be out-of-bounds in flood conditions, there should be no impediment to our installing the necessary ropes on the dry route in. As it turned out there was an impediment…our inability to find the Baudin entrance. A fourteen-year interval had been long enough to wipe out memories of an walk-in that several of us had done numerous times in 2005 and a large group of us, dressed for a caving trip, spent a tiresome couple of hours thrashing up and down a rain-sodden hillside woodland looking for visual clues that might spark memories. Eventually Stuart Bennett, separated from the rest of the group (and who'd never been to the cave before) found the entrance, but not before the rest of us had headed back down the hill to re-group at the car park. Back in 2005, I'd written up our through-trip for the SWCC Newsletter and written a description of how to find the entrances to the caves at either end of the system, but (to my great annoyance) I'd forgotten to dig out my copy before leaving for France.

Some of the group decided that they'd had enough of wet woods for one day but there were still more than enough of us to do the job, so we set off back up the hillside, walking past the raging river that was the outflow from the Verneau resurgence, and were at the entrance in fifteen minutes. The Baudin is a low and uninspiring entrance with an impressive draught emerging from it, but we were grateful to be going underground (and out of the rain) and headed off into the crawl. Much of the route to the streamway from this end involves crawling in low passages across mud floors, with the occasional larger chamber. Duck-boards have been installed in a few places to avoid crawling through sections of liquid mud. Twenty minutes in is a short pitch that takes you to a tight and intimidating downhill grovel, which in turn emerges at the awkward take-off to a pitch down to the streamway. Rather than abseil all the way to the floor, it's necessary to pendulum across to reach a wire traverse (think Bolt Traverse, but without the comfort of a big ledge to stand on), and Stuart did an excellent job of this in intimidating circumstances, with a stream in full flood howling some five metres below him. In normal conditions the wire traverse serves to avoid several deep pools and one can reach the streamway with relative ease, but the stream was inaccessible today and Stuart had no option but to tie the end of the rope to the traverse and retreat. The Baudin was rigged ready for through-trips: first box ticked.

Next up was rigging Biefs-Boussets, and after a break of a couple of days to let water levels subside, four of us parked in the convenient layby that is just a couple of minutes' walk from the cave entrance. We had three bags of rope, enough to rig the pitches all the way to the *collecteur,* the main streamway.

Both ends of the Verneau traverse have warning signs, in three languages, making clear the dire potential consequences of entering the cave in unsettled weather, and this message is properly reinforced by the presence of tree-trunks in the floor of the passage, some of which have been washed a long way in and down a couple of vertical pitches. By now the cave was, though, back to its benign summer state and we made our way down an easy canyon passage, interrupted by a sequence of short, uncomplicated pitches, with only a trickle of water in the stream. Forty-five minutes in, the nature of the passage changes and you enter a series of awkward crawls and tortuous, narrow traverses. We'd started with three tackle bags between the four of us, and the member of the party without a bag decided that he was surplus to requirements here and returned to the surface. When we'd picked up the bags on the surface, I'd inadvertently drawn the short straw and had the bag with ropes packed for the last of the pitches down to the *collecteur,* so I was lumbered with the cursed thing through the *laminoirs,* and fought with it as it snagged at every turn. Frustratingly, it turned out that the lower pitches are left rigged with *in situ* rope so my annoying baggage was unnecessary, and had later to be dragged all the way back through the awkward section and out to the surface.

Left:
Jules on the entrance pitch
In Biefs-Boussets

We descended the last few pitches but stopped short of entering the main streamway, deterred by the presence of a low duck between the last pitch and the *collecteur* that would have entailed a thorough soaking. But box number two was ticked and the cave was ready for through-trips to commence.

Right:
The rigging team taking a break in Biefs-Boussets

Two days later we were back, a team of four, tried-and-tested on a through-trip in the Pierre St.Martin two years previously – Gary Vaughan, Jules Carter, Stuart Bennett and me. My car was parked in Nans-sous-Sainte-Anne and we piled into Gary's van for the fifteen-minute drive to the Biefs-Boussets layby. As in 2017, the trip couldn't begin until the statutory banter had been exchanged about the quantity of interior metalwork borne by two members of the party – Gary's artificial hip and Jules's metal plates in his leg, the outcome of his well-documented underground mishap a few years back. We changed into wetsuits, recommended attire due to the frequent swims and deep pools encountered in the latter half of the trip. Stuart's wetsuit was a thick two-piece with a hood that attracted a fair amount of comment about how hot he'd get in the Biefs-Boussets' infuriating *laminoirs*.

Gary in the Biefs-Boussets streamway

We rattled down the cave, keeping up a brisk pace through passages with which we were all-too-familiar after the rigging trip two days previously. The last pitch was a superb 30 metre descent, split into three sections, into an impressive gour pool, which we paused to admire briefly before heading for the low duck. Despite most of us being overheated by thrashing through the awkward *laminoirs*, the duck was a cold shock to the system and we emerged into the *collecteur* relieved to have the Biefs-Boussets' upper section behind us.

The streamway is large and impressive, not dissimilar to sections of the Great North Road in Dan-yr-Ogof, and after the trials of the *laminoirs* this stared to feel like the sort of caving that we travel abroad to enjoy. A brief photo stop (Gary doesn't do any other kind) provided a welcome pause before we stomped on downstream. There's 1.5 km of this streamway to enjoy, adequate recompense for the hard work of the route in.

Eventually the presence of ominous-looking mudbanks hinted at the imminent appearance of a sump, and the stream disappeared under the passage roof. We backtracked a few metres and crossed a mud-floored chamber, past a dripping aven, to the base of the first of the by-pass pitches, where a muddy rope disappeared into black space above us.

By-passing the sump involves a detour of an hour, but according to a write-up by Julian Walford in the UBSS Newsletter (Third Series, Number 1, 2005) it's a short and shallow sump that presents no great difficulty, although a wetsuit hood is recommended. However, there's no doubt that free-diving an unfamiliar sump on a big trip like this is not for the faint-hearted and, as in 2005, we opted for the dry by-pass. . The 'up' pitch into the by-pass is an airy 35 m prussik, with a couple of re-belays, and personally I have always disliked prussiking on in-situ rope of uncertain age and provenance. I concentrated on short, steady movements and tried hard not to look down at Jules's light on the section below me.

Ascending into the sump by-pass. Stuart, centre, with Gary, in yellow, above him.

Eventually I hauled myself over the lip of the pitch and caught my breath before unclipping my cows' tails. I waited for Jules, and took a hasty picture for posterity as he appeared at the pitch-head. Gary and Stuart were a little way ahead of us and out of earshot, so we made our way back down the second half of the by-pass, an uninspiring, steeply descending passage interspersed with short pre-rigged pitches. Soon we re-grouped just as the nature of the passage changed - we were back in the continuation of the *collecteur* - and we set off again into what, after stooping through a low U-tube, soon became a large and impressive passage, eventually reaching the huge Salle du P'tit Loup.

Jules at the top of the sump by-pass pitch.

Back in 2005, I seem to remember that Jules and I (who did the through-trip as a pair) had relied on instinct and experience to find our way through to the Baudin, but Gary had memorized all of the key route-finding points from the description and this had the advantage that we always had a pretty clear idea of where we were and what we were looking for. A rope down to the left, ignoring reflective markings heading up a boulder slope to our right, was confirmed to be the preferred route. The cave became more spectacular the further we went. After passing some fine *marmites* (potholes) we were at the Puits de Jonction, the point at which the two caves were connected back in 1975.

At this point in 2005 we abseiled down into a streamway heavily polluted with sewage, so it was with great relief that we dropped into a superb clean-washed river passage. Getting off the rope, though, is awkward as the water at this point is out-of-depth, necessitating some frantic water-treading while pulling slack through the descender to unclip it.

In my report from the 2005 trip (SWCC Newsletter 127), I wrote that the Grotte Baudin was the best part of the through-trip, and at this point I began to remember why. We stomped along a large streamway, with occasional scrambles over boulder piles, and swam through a series of lakes. Next up was the magnificent Salle de Bon Negro, with its spectacular domed roof – truly one of the finest underground chambers I've been to.

The Salle de Petit Negro is almost as impressive. I made a mental note of the time, as I wanted to establish whether these chambers might be within range of a dedicated photo trip from the Baudin entrance, something I was planning to combine with de-rigging duties. A few hundred metres of streamway were followed to a boulder choke, beyond which we went up an in-situ rope on the Puits de Legionnaire, into a large fossil gallery that again caught my photographer's eye. Soon we were back in the streamway, and with Gary able to identify each of the landmarks and chambers we could track progress easily when we stopped occasionally to study the survey.

As we progressed with increasingly tired legs, I remarked that the Verneau traverse is distinctive in that it features very few sections of easy caving. Often on these big continental trips there are long, straightforward passages that act as periods of 'recovery', but just about everything on this trip requires commitment and effort. You're constantly 'caving' – clambering, swimming, wading or traversing when not abseiling or prusiking (often on in-situ tat with sub-optimal rigging, that requires more physical effort than expected), to say nothing of the thrutching and grovelling required in the Biefs-Boussets' *laminoirs*. This section of the trip, though, rewards all that effort with some magnificent fossil passages, domed ceilings, and superb streamway. We continued to tick off the landmarks and as we entered the Salle Christian Devaux it was clear that we were on the 'home straight'. The last few hundred metres of streamway were superb but by now we were focused on looking for the wire traverse on the left-hand wall, and it was with some relief that we clambered up to the wire, back now in familiar territory. The cave wasn't done with us yet, though. The traverse is strenuous and I followed Stuart's example of abseiling down from the midway point, where he'd rigged the rope, and then switching to prussik mode from the lowest point of the rope. While Stuart made this look straightforward, I made a right hash of it and couldn't stop the rope pinging out of my chest jammer every time I weighted it. After ten minutes of fighting, with some guidance from Gary (who was watching from above, waiting for me to get out of his way), I finally managed to sort myself out and set off for the top of the pitch. Transferring from the pitch-head to the tight uphill grovel is an awkward manoeuvre at the best of times, so I composed myself carefully and double-checked everything before hauling myself, breathless and sweaty, into the crawl with a big sigh of relief.

After so many kilometres of fantastic cave, the exit through the Baudin's muddy crawls is a real anti-climax. But soon the air begins to smell of the outdoors, and the pace naturally increases as the end draws near. We came out of the cave to a warm but cloudy evening, some nine-and-a-half hours after entering the Biefs-Boussets.

Gary emerging from the Entrance.

In my report from the 2005 trip, I concluded that the Grotte Baudin was definitely the best part of the Verneau through-trip, and (leaving aside my glaring omission in not re-reading that report before the return visit), I stand by that conclusion. Naturally a through-trip has a certain appeal, but the Gouffre des Biefs-Boussets is hard work and much of it is, frankly, tedious, while the sump bypass is uninspiring. The fact that you then end up in the finest sections of what is a truly magnificent cave with a lot of hours in your legs inevitably diminishes the enjoyment of those passages and chambers. There's definitely something special about going into one cave entrance and re-emerging into daylight several kilometres away, having not re-traced one's steps at all, but in the case of the Baudin I would give serious consideration to exploring the cave from the bottom end to really appreciate it. There are also some (reportedly) spectacular passages that those on through-trips miss unless taking significant diversions from the main route, something one is unlikely to do on a trip as unremittingly arduous as this.

Afterword

I achieved my aim of a return to the Baudin for a photo trip (grateful thanks to Gary and Jules for assistance with this), but I had by then decided that my initial photo objectives (the Salle de Bon Negro and Salle de Petit Negro) were too far in (and too much strenuous caving) to be reached as part of a de-rigging trip, and we concentrated instead on photographing the Baudin lower streamway, and chambers and galleries that almost matched the more remote ones. However, a few days after our through-trip Paul Mackrill, Velma Aho and John Cliffe also completed the traverse and Paul took some superb pictures of the big chambers, armed with nothing more than a smartphone (albeit a very expensive, top-of the-range one) and using only his fellow cavers' lamps for illumination. To have achieved the same pics with 'traditional' cave photography techniques would have required a lot of gear and a lot of time and effort – the world of adventure sports photography is definitely changing...

Editor's Note: Some of the photographs mentioned by Tony, both his own and the ones taken by Paul, are reproduced elsewhere in this Newsletter, and to emphasise Tony's point, Sanita's back cover photograph was also taken using a smartphone.


Above and Below:
A selection of Paul MacKrill's photographs taken on his traverse of the Vernau.


Grotte de Chauveroche

Taken from the logbook of Gary Vaughan

Entry dated 4th August 2019

This is a cave that one can easily become cold in. The parking spot for the cave is marked by a signpost identifying the start of the footpath to 'Grotte de Chauveroche'. Along with Tony Baker and Martin Hoff, who were doing a photographic trip into the cave, we all changed into our wetsuits at the carpark. A pleasant 10 minute walk along a track leads to a smaller path which then starts to climb more steeply up a scree slope. A limestone cliff is reached and following up a gully along the base of the cliff a short steel ladder assists amongst the chaos of boulders and tree trunks. The entrance is reached in about 20 minutes from the carpark.

Both teams prepare for the off. Photo Jules Carter

A short crawl of only 2 or 3 m leads to a roomy chamber where the way on is through a triangular notch filled with a half a metre of water. Thus it starts, the first wetting within a minute of entering the cave. The passage beyond is of roomy proportions and floored with glutinous mud. This is followed for about 5 minutes to arrive at a low arch that requires one to crawl through the water and mud. It is all rather sticky! Beyond, things generally improve; the mud comes to an end and a fine, dry-floored passage offers easy and fast progress. This is an extremely pleasant part of the cave. There is one low crawl beneath a flat arch at one point, which has the appearance of being a sump in wet weather, just like the previous low arch. Aside from the low arches, however, the passage continues in fine form to swiftly arrive at a gallery with three ways on. Directly ahead, and low on the left-hand side of the passage, a low duck over a lake marks the start of the lakes that are to follow. The second passage is up ahead and to the right-hand side of the passage. Ducking under a sloping arch, a slippery upward slope leads up into a large gallery and the way on towards La Plage and the start of the lakes proper. The third way is a sharp, right-hand and downward turn into a low passage of gours, 'Les Petits Gours'. This becomes low and squalid after a couple of minutes progression.

"This is a cave that one can easily become cold in…"
Photos: (above) Tony Baker, (below) Clive Westlake.
(Clive's image dating from a TSG/CDG trip in 1982)

From La Plage the first lake leads off into the distance in a canyon 6 -10 m in height and 3 m wide. The water commences thigh deep but soon becomes deeper; the first seven or eight lakes are all similar, with one or two being separated by small gour basins. Most of these can be crossed either by tiptoe on the muddy floor of the lake or by feeling your way along the walls on microscopic ledges. The climb out at each gour is small, about a foot or so in height and offers no technical difficulty. Counting lake numbers is simply impossible due to the complexities of what does and does not constitute a lake; it is all rather subjective. By about lake 8 there is a subtle change as the lake water clears and the floor is gravel, not mud. The shape of the lake remains the same, a long canal between high mostly straight walls. All super stuff. There are a further five or six lakes like this with the depth of water becoming slightly deeper in each successive pool.

There then appears a travertine wall which fills the width of the passage in a quick succession of gour pools going up and then a quick succession of gour pools descending to the start of the 'awful muddy pools'. These are completely different to the preceding pools. A muddy, water-filled trench leads between the muddy ledges, where the water is generally thigh deep, but there are odd holes or troughs here and there holding a greater depth. There are about five or six such pools before the floor lifts to become normal streamway floor. The water from the streamway disappears off down a rat hole in the right hand wall and forward progress is now made stepping from pool rim to pool rim and from ledge to ledge with most of your body dry and out of the water. Generally, you can warm up along this section, however there are exceptions, and a second series of long, canal-type lakes are to be found above the 4 m cascade with the tatty handline. One of these is definitely a swim. These upper canals eventually give way to more streamway progress and a second pretty calcite cascade with a deep pool at the base. The cascade is easily climbed to the left. Not far after here the confluence is reached and the way on is the smaller tributary to the left which is a much smaller passage than the preceding one. Generally, this is about 1 m wide by 1.5 m to 2 m high; not small, but easily braced against to gain holds. Forward progress involves finding ledges to stand on , most of which are underwater. This goes on for around 20 – 30 minutes until a deep-water duck is made under the left-hand wall. This point generally marks the start of larger and more roomy passage with a pleasant, flat, gravelly floor. This is another superb section of streamway where easy going leads through a couple of larger galleries containing fallen blocks. Not far from the second of these larger galleries the roof comes down to bring the streamway to an abrupt end at the upstream sump. The sump pool can be reached by two routes, a wet duck to the right, through which sharks can sometimes be seen, or alternatively, back up 10 m and taking the easy dry gallery to the balcony above the sump pool where a divers' line is fixed. Allegedly (according to the survey you are 6.2 km from the start) you are now 4.7 km from the entrance. Although being quite warm on arriving at Lac Rond, a short sandwich stop and a couple of good mouthfulls of water soon made me feel a little chilly and I think we were both of a mind to get moving again. 3 hours 20 minutes on the inward leg and 3 hours exactly on the outward leg, including a brief 10 minute examination of the other branch at the confluence.

Jules in sump pool, with shark…. Photo Jules Carter

Route finding out of the dry 1.5 km entrance series seemed 'more complicated' on the way out. I think there is a faster, low-level route and a slower, high-level route, although the survey does not reveal any junctions. We washed off a little in the triangular notch pool which at least mostly consisted of H_2O as opposed to mud. Pools in the small surface stream about halfway back to the car also proved an excellent place to remove mud.

Jura 2019 – A miscellany of minor caves in the Doubs

Andy Dobson

Grotte des Faux - Monnayeurs.

Location: 32T 294030 5212040

After trying each lay-by above Mouthier Haute Pierre, we finally parked in the right one (third lay-by up after the hairpin). The cave was signed on the footpath down, with a few minutes' walk in the woods soon reaching the 10 m steel fixed ladder up into the impressive entrance. A large tunnel with a cool draught headed straight ahead, though care was needed on every climb as the rock was polished smooth. Easy progress along big passage was followed by a climb up on the left, over large blocks, still in a sizeable continuation, to a climb back down to a low arched pool. The route description stated this could be passed carefully using a fixed wire, however, I found no evidence of this (or indeed any fixings). Instead, a crawl along a sloping ledge on the right of the pool, around where the roof was lowest, then a short wade when the roof rose, reached the far side of the water. Ahead closed down; I checked a wet chimney up but this also choked, so I called back to Brian and Dave (who were still on the dry side) not to bother getting wet. However, on turning around, a climb up just to the side of the pool, with black space above, beckoned. I followed a spiralling route up into a very high chamber with a considerable climb to reach the top. Although away up on the left led to a further small chamber, everything seemed to close down or go to rat holes.

Both Photographs: Dave Dobson.
Above, Brian and Andy in the main passage
below, Andy in the upper entrance.

Returning along the main passage, just above the climb down from the breakdown pile back towards the entrance, we took the ascending tube leading to the higher entrance of Grotte de la Vielle Roche. This was a complete contrast, mostly stooping-height or hands and knees, with a hot in-draught; after the cool of the trunk passage this felt like a giant hair dryer. The sweaty ascent eventually popped out on to a window entrance ledge in the cliff face with a view across the gorge, with 'P' hangers installed on the right to provide an abseil down.

Using the 'P's as finger holds I climbed round to gain the bluff, which gave a better view but no way on, necessitating a careful climb back to the safety of the ledge and a sweaty grot back down to the entrance passage and some welcome cool air. An easy womble of a cave which can be combined with the Source de la Loue walk, if you turn around at the pool rather than getting wet.

Grotte de la Baume du Mont. Location: 32T 283740 5209810

We parked on the wide, roadside meadow verge, opposite the cattle grid gateway into the field, then took the nebulous path from the grid to the cattle trough on the far side of the field. Climbing over via the trough surround to avoid the barbed wire fence, we walked a short way across the second field to the obvious wooded depression. A narrow wooden-fenced entrance was people- sized to keep the cattle out. An impressive shaft with a stonking fixed ladder down led to a path along the wall (with handrail!) round to a slippery, loose slope. At the bottom, a large chamber with lots of formations presented ample photo opportunities. Carrying on along the chamber we climbed up between stal columns to a smaller continuation with multiple graffiti of some considerable age. A small final chamber contained the clearly visible "Courbet" signature of local artist Gustav Courbet; we pondered on the question of 'when does graffiti becomes a historical artefact?

Left: The 'Graffiti'. Photograph: Dave Dobson

(Editor's note: Courbert became a famous, not to say notorious, artist in mid-nineteenth century Paris.)

The cave was so well decorated that we returned (on a rainy day) for a proper photo session, carefully negotiating the cattle; fortunately the bull, on his own in the first field, was uninterested in my bright red oversuit! Another excellent short cave, but again with care needed as it is quite skiddy underfoot.

"The cave was so well decorated……." Photograph: Dave Dobson

Perte des Ravieres

Location: 32T 280780 5209220

Taking a back road off a back road off another back road, we parked on the verge at a junction only a few yards from the cave entrance, which was situated in an overgrown thicket, showing it had not been visited much lately. The entrance crawl, which clearly took a stream in wet weather, soon led to the 9 m pitch, but this turned out to be an easy free climb with plenty of ledges and holds. The cave's character throughout was marked by protruding rock bands and ledges which both helped with climbing but hindered straight forward progress. With few walking sections and much meandering, this was very much a cavers' cave.

The bottom of the climb emerged into the side of a chamber (one of the few), Salle Monelle, a handy place to stash the unused rope and kit. Climbing down slope and through crawls between awkwardly placed boulders, we reached the stream. Following downstream required a succession of climbs up and back down in meanders which continued after the stream disappeared. Thrutching on at floor level I reached the 'Puits Salai' pitch-head, which is actually a dead end, while Brian climbed to traverse at roof level to find the bypass climb around above the pitch. A small awkward passage became a crawl to a window with knotted hand line; this dropped into a bigger passage from which a further awkward climb down saw us reach the Salle D'Affluent, unmistakable as it was the only bit of cave big enough to be a 'Salle'!

Following downstream, this section had several small cascades with progress requiring climbs up and down, as usual, but in more pleasant passage, though gradually narrowing. We noted the junction with a higher-level passage off to the right, while first continuing to follow the stream as it, at last, became mainly walking in pleasant passage. The stream turned a sharp left bend and we found a constructed dam with plastic piping taking the outlet water away and down the intriguingly named 'Vagina' Pitch just ahead. A greasy climb with hand line took us to the head of the pitch; the bottom was clearly a dig, with drag tray and buckets, the pipe diverting the water away. Obviously a considerable amount of effort had gone into the project.

We returned to the junction and climbed into the rift passage, 'Galerie des Eccentrics', which quickly became a muddy thrutch but, unlike the rest of the cave, featured some formations: small stals, calcite flow and false floor (somewhat broken up). Eventually, after a very tight crawl, we located a few helictites. Just past these, the passage contorted still further; although some thin people had clearly thrutched along at mid-height, the floor was unmarked, so we turned back here.

As ever, progress back up the cave proved much quicker than on the way in, with route finding now easy until we reached Salle Monelle and failed to spot the climb out. As so often, all the wear on the floor continued past it, due to most cavers making the same mistake. Dave retraced the route along the wall to locate the 9 m climb, which was surprisingly well hidden. With this minor hitch sorted, we grotted out of the entrance crawl into bright evening sunshine. An excellent trip for those who enjoy assault-course caving, with almost no walking and lots of technique required. A little less mud might have been more pleasant, though.

Gouffre des Ordons.

Location: 32T 274973 5224950

We initially missed the turning for the track into the woods as it looked like an entrance to the stables. A stony track goes off, just past the stables buildings but before a paddock, with the road ahead going into the woods. A careful drive on a forest track leads to a roomy, wide parking area. Checking Brian's GPS, we followed the obvious walking path heading in the right direction only to find it then swung away, leading to the obligatory thrash through brambles and undergrowth to locate the entrance and find it was at the end of a nice easy path. The correct path from the parking area is the wider track, slightly to the right of straight-on from the driveable track we came in on; follow this for approximately 250 m, then take a left turn which goes straight to the cave.

We expected the pitches to be 'P' hangered but found the top of the entrance to be festooned with mainly dodgy-looking spits, so belayed to the tree which had clearly been used many times before. Brian rigged the first pitch economically, only to find that from the bottom of the P8 there were eco-hangers all along the traverse and for the second 18 m pitch. Some faffing was required, as we had two ropes, 15 m for the top pitch and 35 m for the traverse and second pitch, while in fact one single rope of 45 m would be simpler. The second pitch required a careful rig to avoid a rub point a short way down. The pitch landed at the top end of a large chamber, where a defined path, marked out with electric fence wire (not live!), is necessary for conservation as the entire cave is very well-decorated. The path runs between a multitude of stals, with fluted flow down the walls, followed by a fixed climb reaching the further part of what is essentially one long chamber. There was much evidence of ancient, natural stal breakage, with many columns toppled over or broken but now recalcified; an unusual feature was the many, flat-topped stal bosses.

Brian on the entrance pitch. Photograph: Dave Dobson

Near the end of the chamber iron hoops had been installed to enable a climb through what was almost a stal choke, giving access to the final mini-chamber with more pretties. The return along the highly decorated route necessitated a series of photo sessions.

With only short pitches, daylight was soon regained. However, getting off from the top of the entrance pitch proved awkward, with no holds or ledges and our economical rigging; putting in an extra loop may be a good idea. A superb short cave which impressed everyone who visited it.

Some of the very fine decorations. Photograph: Dave Dobson

The ICCC/JSPDT Expedition “Maraton” 2019

Úna Barker and Rita Mallinson Cookson

Imperial College Caving Club has a grand and long-standing yearly tradition of expedition caving in West Slovenia, affectionately known as "Slov", in friendly collaboration with the local caving club, the JSPDT (Jamarska Sekcija Planinskega društva Tolmin). This year we were also joined by three members of Nottingham University CC, proof that the club’s supposed policy of splendid isolation has been at last overturned - vive la révolution! The expedition is based on (and in) the mountain Tolminski Migovec, part of the Julian Alps located within the Triglav National Park, close to the Italian border. Every year a large group of ICCC members with various levels of caving experience - from old lags to "Slovices" (Slov + novices, typically those who have only been caving for one academic year) head up to camp on a mountain, in order to not wash for weeks, drink a lot - oh yes, and do some caving too!

Úna and Rita are both ICCC as well as SWCC members, (and can say neither acronym), so we were lucky enough to be invited along to the expedition! Neither of us had been able to go the previous year, so we were counted among the “Slovices”. Rita was unfortunately only on the mountain for two weeks, (next year will be longer!), while Úna was lucky enough to spend the whole five weeks there. Despite this, the latter had far too good a time lounging around enjoying the stunning alpine scenery to go caving and managed only one trip. Meanwhile, the rest of the club participated in continuous underground exploration via a day/night train hotbedding system. Almost every trip to underground camp involved “Slovices”, always accompanied by more experienced club members from whom they will be taking over in a few years.

ICCC have the special privilege of being allowed to camp in the national park for the purpose of our expedition. Goodbye cosy caving huts, hello changeable alpine weather which will have you sweltering in a single layer in the morning and then shivering in six at night. The beauty of the place more than compensates though, and sunset-watching is one of the more popular evening pastimes. Tents, caving kit, personal kit, other equipment (including the all-important cavelinks) and food must be carried up in rucksacks. People said it made them feel fitter for the caving bit after two days walking up and down that mountain, but personally Rita just felt dead. Everyone else ran up as fit as mountain goats - like chamois, a kind of goat/deer found on the mountain. The walk takes an average of three hours, though more competitive members who don’t care enough for their knees have managed it in half this time while carrying heavy loads of food and maillons. Úna decided that this draining trek was just wonderful, and did lots of carries without ever getting around to the caving part - better serving the expedition by maintaining stocks of crackers and cheese, as well as personally supplying some obscenely sweet fizzy wine to enjoy (perhaps) at sunset alongside the usual mystery cocktails and god-awful cooking rum.

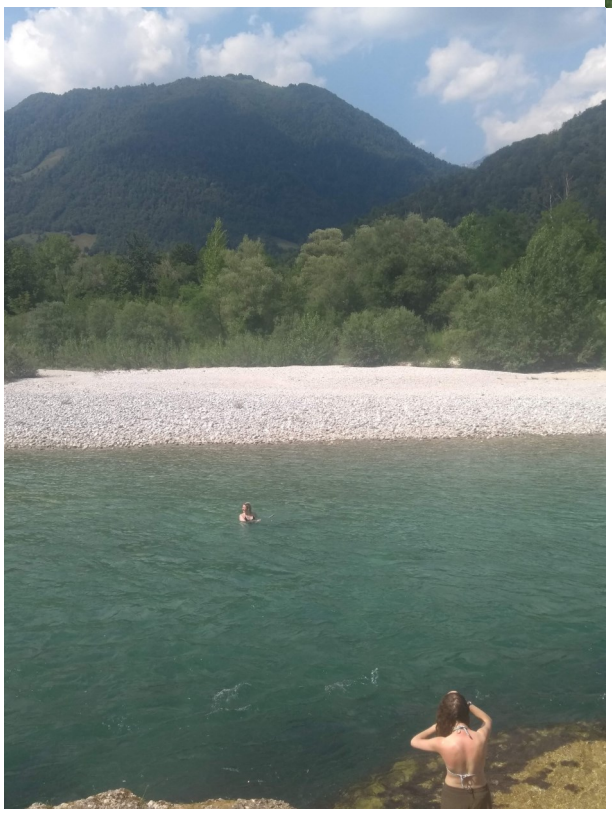
When we're not caving or carrying, we spent most of our time in what is called the "bivi”, but which doesn’t have much to do with my idea of what a bivi is! The bivi is at the heart of the whole expedition – where food is cooked, plans are made, and convoluted inside jokes come into being. It features tuneless singing, the noxious fumes of burning rubbish, and people throwing things at fat bivi mice. A haven for returning cavers, the bivi is also a kind of inescapable purgatory for the non-caver, who is forced to lie about eating crackers and trying to recall their purpose in life. (Some of us wouldn’t know about this as we actually went caving.) The focal point is a circle of stone seats with a fire at one end, with "comf" to sit on, when we’re not fighting over who gets what amount!

So, regarding the actual caving - the Hollow Mountain contains over 42 km of cave passage as of the beginning of the trip, which is why this year’s expedition was nicknamed “Maraton” - Marathon - as technically you could run a marathon in the system! Though as the system is largely vertical, it might be a bit of a challenge… can you count ropewalking as part of it?

Most of the details about the specific caving can be found on the UK Caving "blog" which was updated while we were in Slovenia, so we won't bore you with too much repetition! It can be accessed at www.ukcaving.com/board/index.php?topic=25199.0 or by googling "UK Caving ICCC". By the time Rita had arrived, an underground camp had been set up - known as Tranquillity Base, Hotel and Casino Adventure Camp - so day and night trains were running, people were pushing Klic Globin and Rhys and Anna had discovered a slightly different entrance - named Belladonna - to replace Primadonna, which thankfully Rita arrived just in time to have a try at! She spent most of her two weeks trying to get to know the systems, poking around small holes in the hope they went, getting stuck so as to avoid going over a very small puddle, doing bits of surveying, and making exciting plans for next year. Also, spending far too much time in Ravne, drinking lots of exciting exotic alcohol while trying to stuff Úna into a tacklesack…

Right: Úna duly stuffed in her tacklesack! Photograph: Rita Mallinson Cookson.

One of the more dramatic things that happened this year was an entrance collapse! The crawl at the entrance of Prima had collapsed as a team were exiting and two of the three were trapped inside. Thankfully, the pair inside had a bothy bag to huddle in while cavers on the outside rushed them food, water and cigarettes (essential!). Only one caver currently on the mountain had rigged the other route before who had only just arrived - but with no kit. So with borrowed everything, they rushed off to rig the alternative route (amusingly known as Drugi Vhod, "other entrance") and rescued the stuck cavers, after a total of three days underground!



Left: The authors enjoying some wild swimming with a fine mountain backdrop. Photograph: Rita Mallinson Cookson

Despite the trials Imperial faced on the mountain this year - the entrance collapse, recurring storms and flooding - they valiantly pushed on and a total of 1.3km of new cave was found and surveyed. Several new leads were shut down as well, exciting new plans for next year were made, and MANY different types of alcohol were drunk. We did find slightly less cave than average, but hopefully next year will lead us 'onwards and upwards' or more literally, inwards and downwards!

Cueva Narizón / Torca Palomas

Castro-Urdiales, Cantabria, Spain

Neil Weymouth

with Photographs by Claire Vivian

Cantabria is a land of huge passages and lengthy pitches, but what do you do on a 'rest' day?

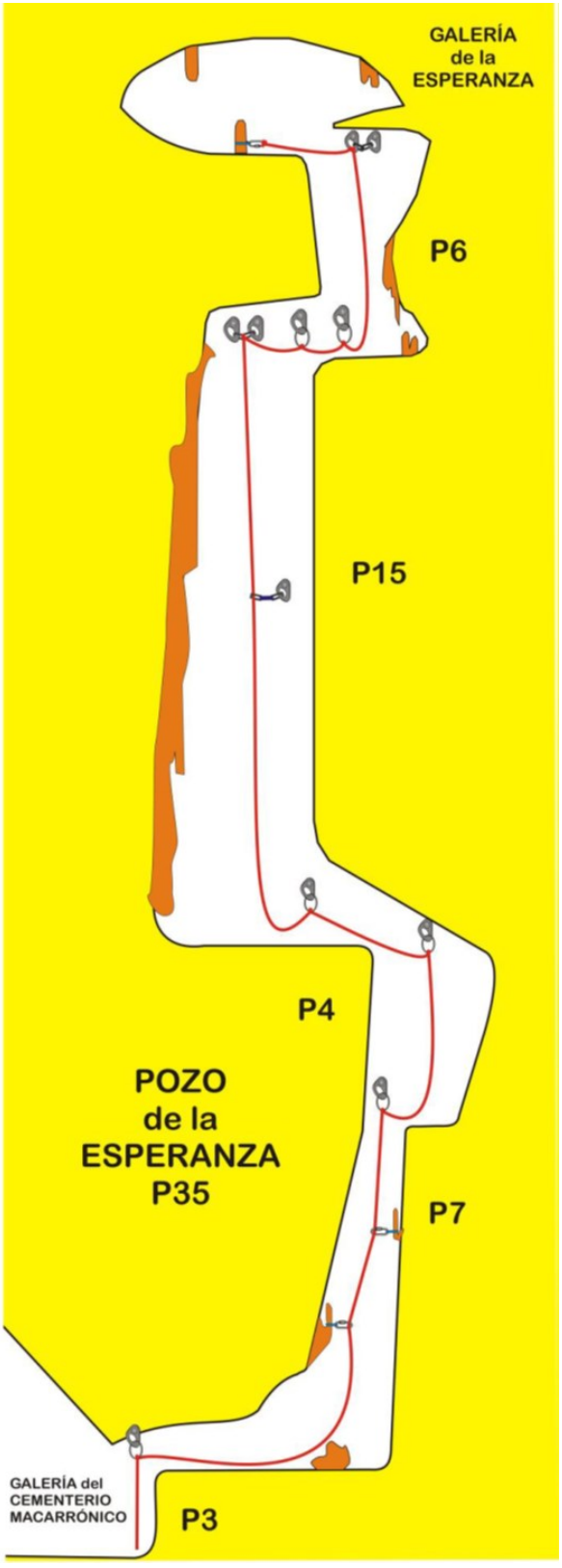
A small cave near the coast caught my eye. As you drive along the coast, from the airport, a huge limestone quarry appears, as if to remind you this is big limestone country and perhaps there are caves nearby. Sure enough, the Cueva Narizón and Torca Palomas lie behind the quarry wall on the righthand side. Parking is just outside an industrial estate where HGV's manoeuvre around cows nibbling the verge. Torca Palomas (43.345605, -3.236693) has a large entrance 100 m down the road and 50 m up the verge; you rig a 30 m rope down the mud ramp entrance to facilitate an exit.

Cueva Narizon (43.344677, -3.236899) is 100 m the other way and a 150 m zigzag up the bank. A small entrance leads to a series of ancient chambers and a gallery, which leads to a chamber and a double-back up on the right. So far, all a bit shabby, but then it gets more interesting; the Galeria de la Esperza is low, wide and contains many straws, and a long, crawling section wends between straw barriers, which are occasionally broken to allow progress. The passage height increases and soon a series of short pitches in rifts follows, 35 m in total, dropping into an elliptical 8 m wide passage. NE is the way on, but SW leads to the highlight of the trip, the Galeria Del Cementerio Macarronico, 100 m long. This is a walking / stooping passage leading past large gour islands topped with stals and helictites. Halfway along on the RHS is an ascending passage leading to the Jewellery Shop; many white and clear crystalline helictites decorate the ceiling and walls, together with clear baubles on impossibly fine stalks. The gallery continues, ending via a crawl into a well-decorated, large chamber.

Back at the pitch base, a short walk leads to a P6 dropping into the active stream of Torca Palomas. Downstream, a 10 minute walk leads to a window of daylight and the muddy rope. We found all the pitches inside the cave were pre-rigged, so only the exit rope is required. The trip time is about 3 hours including many photo stops.

A Google Earth view of the location. The quarry mentioned is clearly visible. The cave entrances are in the bluff, above the industrial buildings in the bottom right quadrant of the image.

The rigging topo below and the surveys on the following pages are from this document:
http://www.espeleocantabria.net/gallery/narizon_palomas_travesia.pdf
which also describes the cave in some detail—in Spanish.
The photographs below and on the preceding page were all taken by Claire Vivian on the trip Neil describes.




TORCA PALOMAS
(P30)
SIFÓN TERMINAL
PÉRDIDA
CONEXIÓN CON
CUEVA NARIZÓN
SALA DE LA
ENCRUCIJADA
GALERÍA DEL OSO
SUDOROSO
SALA DE LOS
HUEVOS "ECHAOS"
GALERÍA DEL OSO
RENCOROSO
GALERÍA DEL
COMEBARRO
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N
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SISTEMA NARIZÓN - PALOMAS
CASTRO-URDIALES
(CANTABRIA)
ESPAÑA
TOPO: GRUPO ESPELEOLÓGICO
LA LASTRILLA
EDICIÓN: VIANA 2016
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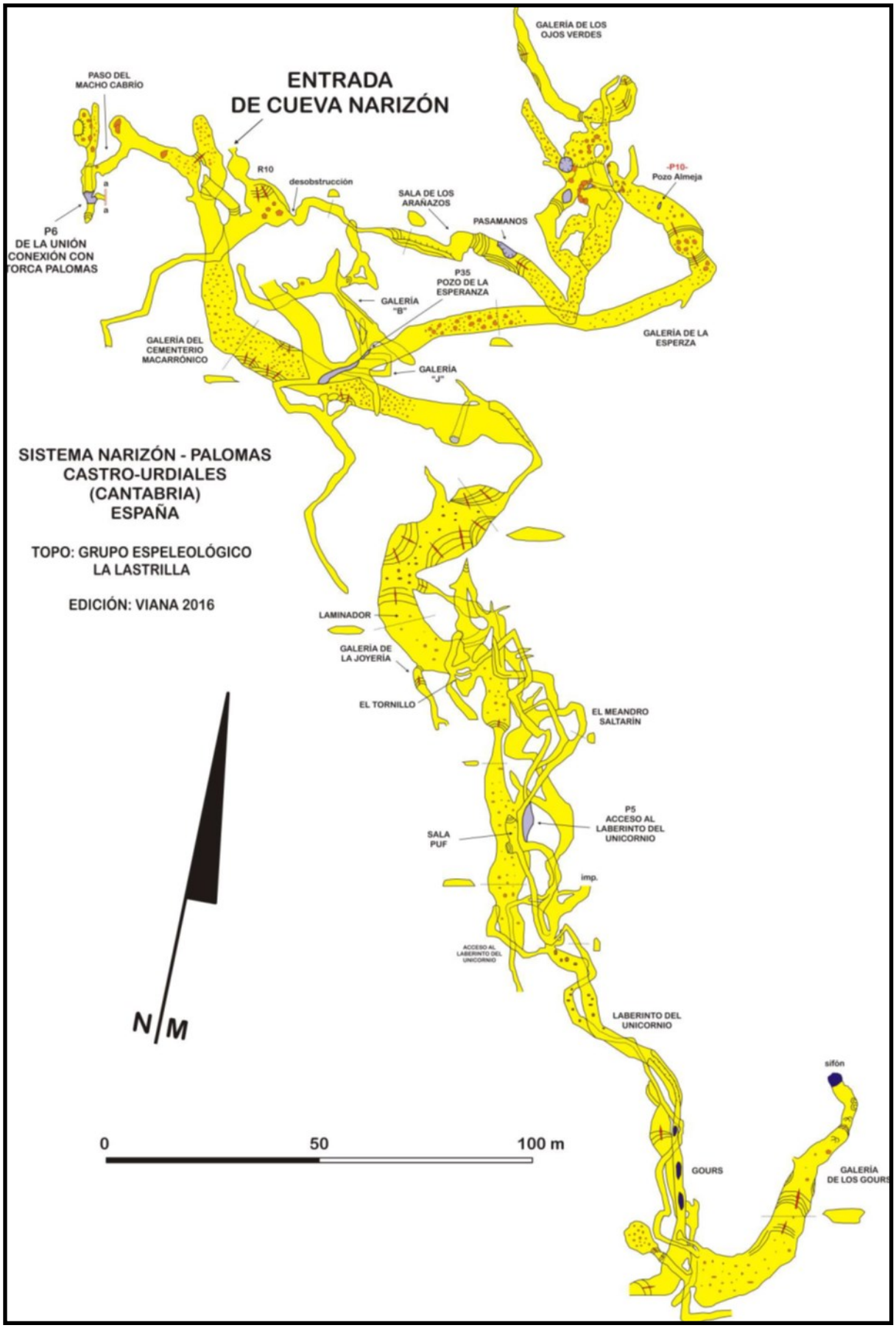
ENTRADA
DE CUEVA NARIZÓN
GALERÍA DE LOS
OJOS VERDES
PASO DEL
MACHO CABRÍO
R10
desobstrucción
-P10-
Pozo Almeja
SALA DE LOS
ARAÑAZOS
PASAMANOS
P6
DE LA UNIÓN
CONEXIÓN CON
TORCA PALOMAS
P35
POZO DE LA
ESPERANZA
GALERÍA
"B"
GALERÍA DE LA
ESPERZA
GALERÍA DEL
CEMENTERIO
MACARRÓNICO
GALERÍA
"J"
SISTEMA NARIZÓN - PALOMAS
CASTRO-URDIALES
(CANTABRIA)
ESPAÑA
TOPO: GRUPO ESPELEOLÓGICO
LA LASTRILLA
EDICIÓN: VIANA 2016
LAMINADOR
GALERÍA DE
LA JOYERÍA
EL TORNILLO
EL MEANDRO
SALTARÍN
P5
ACCESO AL
LABERINTO DEL
UNICORNIO
SALA
PUF
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Exploring Mines in Cantabria

Allan Richardson

Most cavers, when you mention Cantabria, immediately think of the caves around Matienzo and the surrounding area. However, there are also a lot of mines to be found in the region, some having been entered by using the caves as access while others have broken into large cave systems.

Cantabria has a long history of mining, going back to at least Roman times. There are two main groups of minerals, Iron ores in the area around and to the south of Bilbao and leadzZinc ores with associated minerals over a wide area.

Iron mines

An article in Descent No 252 p18-24 by Josu Granja, first alerted me to the mines' existence, even though I had already been to Cantabria a number of times.

There is also an interesting Mining Museum at Gallarta, which has a deep opencast pit (Corta Concha 11) just behind the museum and the town is undermined by the associated mine system. Access however is difficult, as the mine is inspected on a regular basis and is therefore classed as working.

The evidence for many of the iron mines has been for the most part obliterated, although there are extensive remains in some places. One such area is the Grumeran Mendia ridge to the south of Bilbao, where there are a number of interesting mines, some being through trips, others breaking into cave systems. This is Basque country, hence the interesting spellings.

The ridge is criss-crossed with old mine tracks, making access fairly easy as the tracks are still in use by the farmers and are "maintained". There are a number of old mine buildings/structures to be seen in various places. These, together with a good number of natural and man made entrances, mean there is a lot to explore.

Atxuriaga complex
This system is 46.5 km long and 529 m deep (in 2017) and is one where the mine intersected and utilised large cave passages. The entrance 'La Buena' is at UTM 30T, X:0493383 Y:4790714 Z:614m. This leads through the mountain via natural and manmade passages to the 'Bortal' adit entrance on a hillside above the village of Galdames. We tried to access the adit from various directions, but were unable to get through the very thick vegetation which cloaks the slopes. (A brushwood cutter or flamethrower would have been useful.) The route through is at least partly rigged, it involves a low wet and tight section and a long abseil into a large natural chamber. There is a video of the trip on You Tube. The survey is not as yet complete (2017).

Urallaga Complex
This system is 7.9 km long and 118 m deep. The main entrance is at UTM 30T, X:492155 Y:4791430 Z:475 m. This system is one where the miners have exploited an existing large cave system. The entrance is a large, natural opening with a chapel, just inside on the left, which has a statue to Saint Barbara, the patron saint of Miners and Artillerymen, to which there is a local pilgrimage on July 22 every year.

Inside the cave system, the passages have been emptied of mineral deposits, leaving behind large amounts of spoil. This being done using a railway system which went through the hillside in a large mined tunnel, exiting on the same hillside as the Atxuriaga complex, but not connected to it. The tunnel has a very strong draught blowing through it and is at least waist deep in water for part of its length.

There are a number of other mine/cave systems in the area. The two above are the biggest as far as I know.

Lead/Zinc mines

There are a number of lead/zinc mines in the area. Two which we have explored are close to Ramales, the other one we have explored is about an hour and a half to the west near Udias.

Mina La Clara
The lower entrance is at UTM 30T X:464127 Y:4785850.
This is the closest and is on the roadside on the left of the road to Burgos. It was originally opened for lead, but little was found, so the massive calcite deposits were extracted instead, from several levels. The mine level by the road breaks into a cave system. This level has a gate on it but is not locked, as it seems to have been part of some sort of recreational area judging by the remains of benches and walkways. You are advised to stick to the paths as there are a number of well-hidden, deep holes in the scrub.

Climbing up the hill gets you to an area of mine levels which quickly become natural cave passages, one of which is reasonably long but low and muddy.

Further up the hill the path crosses a wide track with a sign to Cueva Severina. This was a large re-surgence cave which is totally choked by infill after about a hundred metres, though a large passage had been dug through the fill until they gave up where the passage height lowered.
Basically, an interesting series of short trips.

Mina Angela at Matienzo
No, not the Matienzo you all know and love, but another one a few miles the other side of Ramales, in the Valle de Carranza, Viscaya. The entrance is at UTM 30T X:469694 Y:4786939

This was an extensive lead mine which was linked to several other mines. Latterly, it was opened briefly as a show mine, but it didn't last long.

There is one main level running through the mine, with a number of side levels, at least one of which breaks in to a rift/stope which reaches the surface. The levels break into a number of large, natural chambers which have been used for dumping spoil but are still large. Some chambers are well-decorated and contain a number of bats, one of which was probably a Greater Horseshoe, judging by its size.

The veins were parallel and vertical, giving rise to high stopes, 2-4 m wide. The working areas are mostly above the main access levels and are blocked by runs of deads and gravel.
There are levels below the entrance level, some natural as well as the man-made. Interestingly, there is a deep (930m +) concrete-lined shaft just off the main level. This had deep, running water at the base of it, though there are no large resurgences in the vicinity as far as I am aware.
The mine is well worth a visit, though probably best to avoid weekends as the mine dumps above are used as the local racetrack.

Hermosa Mine near Udias.
This is a large lead/zinc mine which has broken into the Cueva del Rescano cave system. The entrance is at UTM 30T X:400459 Y:4800317.
The entrance is a large, formerly gated adit, which leads after some distance into a area of small natural passages and old workings. Following the main tunnel round to the left leads into a series of large, natural chambers, which have been used by the miners as processing areas. From here a long decline leads down to the next level, where there are more large, natural chambers and it is interesting to see how the miners have utilised the cave system to their advantage. There are two more, shorter declines to reach the lowest level. Here you can see how they were searching for more mineral as the veins ran out and the mine was being closed.

The mine is well worth a visit and there is also a certain amount of surface remains to be viewed in the area.

The cave system can be entered from within the mine and there are also wide natural shafts (30m + deep) into the cave system to be found in the woods near the village of Rodezas.

The water from the cave resurges miles away at Cueva de las Aguas de Novales, which is near Novales. Near the resurgence is the Mina de San Jose, a zinc mine complex which is closed but is fairly complete; it is best viewed from the perimeter as visiting is discouraged, though there is a well-used path through the site. The mine entrance within the site is gated, but there appears to be an open drainage adit outside of the site. Certainly, there are pictures of underground from this mine on the internet. A site to visit next year. Again, this mine is well worth visiting.

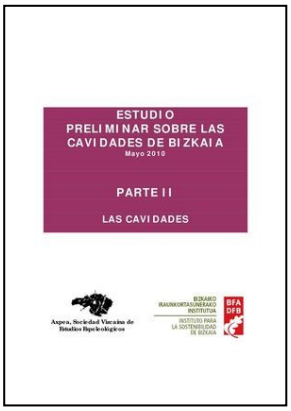
One cannot write about the mines of Cantabria without mentioning El Soplao. This was the La Florida lead mine which broke into a very well-decorated cave system. Surprisingly, the miners didn't damage the formations, even though they could have sold them. This is now a show cave/mine and is well worth visiting.

There is also an impressive show cave, Cueva de Pozalagua, to the east of Ramales, which was broken into whilst quarrying/mining for marble. This is on the hillside near the Torca de la Carlista.

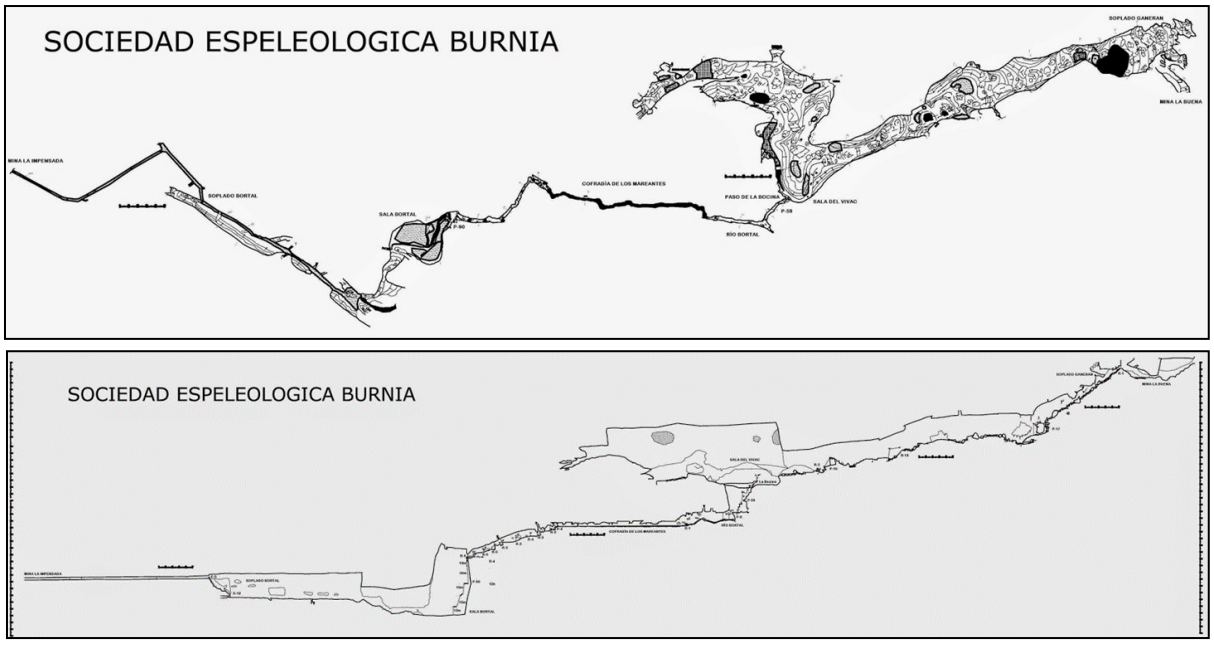
Mine exploration in Spain is becoming more popular as there is a growing interest in Industrial Archaeology.

There is a lot of information available on the internet about mines in Spain, 'Mindat.org' being one source, others, though, are not always easy to find.

Reference:
Estudio Preliminar Sobre las Cavidades de Bizkaia, Mayo 2010, Coordination y edición AXPEA, Sociedad Vizcaína de Estudios Espeleologicos
Out of print but available as a pdf file from:
https://en.calameo.com/books/001001665e78901745b2f
The book also contains information about caves in Bizkaia.



Below: Plan and section of part of the Atxuriaga complex showing the traverse from La Buena to Bortal. These are taken from the book referenced above.



Eurospeleo Bulgaria 2019

Duncan Hornby, Sanita Lustika, Allan Richardson & Claire Vivian

24th - 28th September 2019
SWCC members attending were Duncan Hornby, Sanita Lustika, Paul Mackrill, Allan Richardson & Claire Vivian

Bulgaria has a long history of caving; in 1929 the First Bulgarian Caving Society was founded but the first known written description of a Bulgarian cave is from 1640 in a manuscript kept in the Vatican library. Bulgarian cavers have been involved in many expeditions, including world record breaking descents such as Anna Taparkova being the first woman to reach -1122 m in the Gouffre Berger. They have also contributed to medical advancement in understanding isolation, with cavers in 1971 and 1977 respectively spending 30 and 62 days underground. 1966 saw the creation of organized national cave rescue teams.

Five SWCC members attended the 13th Eurospeleo forum in Bulgaria, which was run during the last week of September. It was the first time Eurospeleo forum had visited Bulgaria.

We all arrived on different days which meant we spent a few days enjoying the fabulous city of Sofia. The main conference site was at a Red Cross training facility in the village of Lozen, just south of Sofia. The site had a hotel, meeting rooms, restaurant and bar. The main conference days ran from Thursday to Saturday, with 4 days of pre-conference excursions starting on the Tuesday. The more significant Kastrakli expedition started the week before and was attended by Allan, Paul and our Finnish friends.

Conference excursions (24th - 27th September)

In the registration room there were sign-up sheets for guided trips to the four cave systems on offer. There was also the opportunity to request transport, useful for the cavers who had not arrived in personal vehicles. Each day we would meet at the entrance of the Red Cross facility at 9am, meet the guides, then grab a seat in their car or van. All caves were about a 2 hour drive away, depending on traffic.

Each cave had its challenges, but it would be fair to say they were not too challenging for an experienced caver. Caving with experienced local guides removed the challenges of navigation and allowed one to enjoy the sporting nature of the caves and their many formations.

Above: The 4 pre-conference cave locations and their proximity to Sofia and the Eurospeleo forum venue.

Kastrakli Expedition
(21st - 25th September)

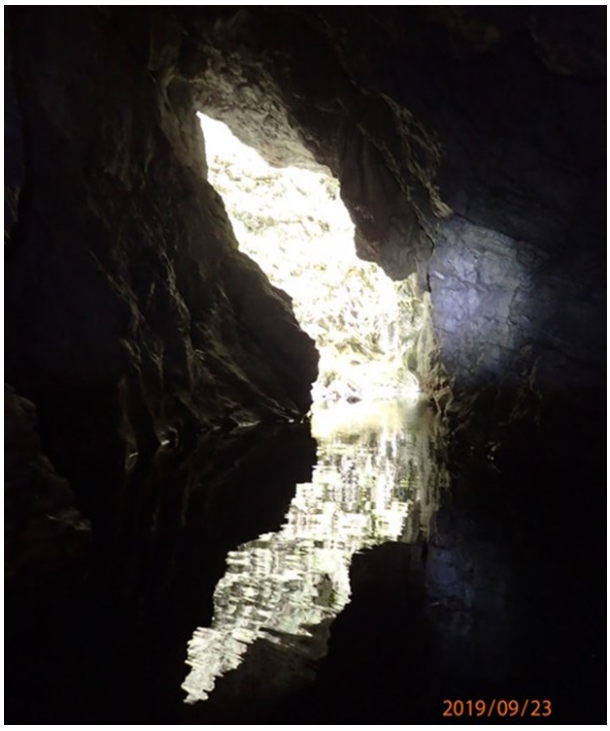
This was the pre-Eurospeleo 2019 Conference camp, which was held in the Western Rhodopes Mountains in Southern Bulgaria, just to the North of Borino. The main camp ran from the 21st to the 25th of September, but it was possible to attend earlier and stay until the 29th. The accommodation was either camping or staying in the "Orpheus" hut.

This is run as a hostel, with clean and comfortable rooms, though the facilities are somewhat basic. Outside there was a large wooden hut, which was the food preparation and eating area, with washing-up facilities and a large, locked, larder-fridge, well-stocked with soft drinks and beer. The controller of the fridge was the hut warden, who was rapidly christened the "Beer Master" and was always happy to make a sale.

Right:
The Orpheus Hut
Photograph:
Allan Richardson

As soon as I (Allan) arrived I met up again with Norbert Hedler, who I had not seen since he helped us with the Club Un-Expedition to Germany in 2018. I had planned to be at the camp from the 20th but was prevented by my luggage failing to join me in Sofia. It arrived the next day, which sadly resulted in me missing out on a through-trip in Devil's Throat Cave, part of which is a show cave. I did manage a trip by boat into the bottom end of Devil's Throat Cave to help retrieve a rope.

Exit to Devils Throat Cave, Below Left, with Aleksander Stoev, one of the conference organisers.
Looking out from Devil's Throat bottom entrance, Below Right.
Both Photographs: Allan Richardson.



Over the next three days there were a number of trips to both wild and show caves. The Bulgarians' aim seemed to be to keep us as busy as possible, which included getting involved in various digs if one wished to. The area is one of rolling hills which are thickly forested, making cave location interesting, let alone finding new caves.

The camp itself was attended by between twenty and thirty people, the numbers varying by the day. The bulk of the cavers were from Bulgaria, but there were quite a few nationalities represented from across Europe and the Middle East.

The Bulgarian food was excellent, the beer drinkable and the homemade Bulgarian Vodka, Slivovitz and Calvados very acceptable, though I wasn't so keen on the Ukrainian Vodka.

All too soon the trip came to an end and the long and bumpy drive to Sofia had to be started. The roads, apart from the motorways and a few major highways, are in very poor condition, which explains the national speed limit on normal roads of 40 kilometres per hour; it was often difficult to maintain even this speed.

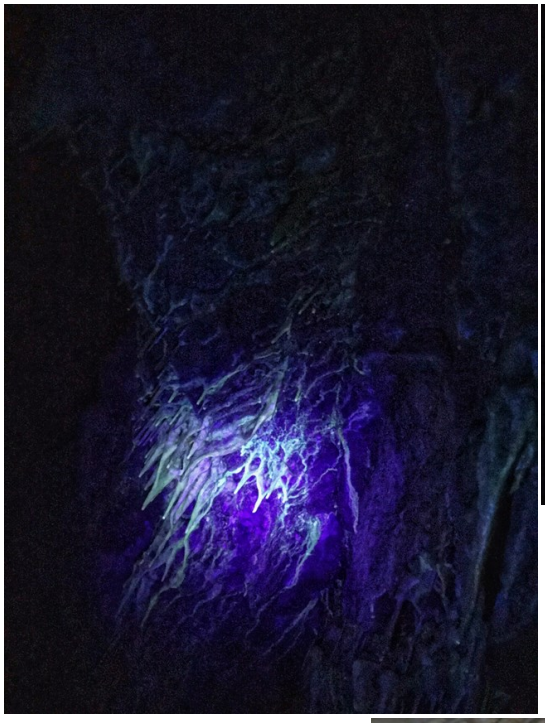
On the way back I visited the Lepenitza show cave, which had been recommended to me. It was different: the only guide spoke no English, which was surprising; the cave itself wasn't lit, so everyone was given helmets, lights and boots; I used my own kit. The cave, whilst interesting, was more like a wild cave. The tourist trail, such as it was, went up and down large boulders, there were muddy caving ropes to hang onto and the wooden walkways and ladders, where they existed, were collapsing and rotten with dry rot. About halfway in, you were required to crawl/stoop in a waist-high passage; at this point, half the group refused to go on (they were in smart clean clothes) and that was the end of the trip.

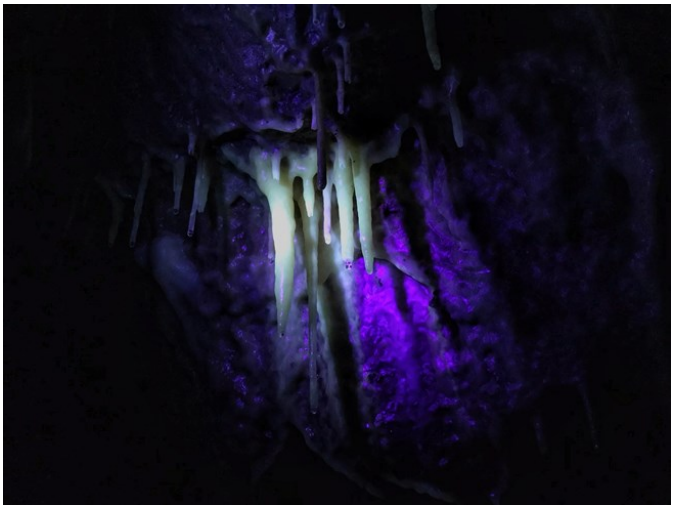
Duhlata Cave (Tuesday 24th September)

Our (Claire, Sanita & Duncan) first taste of Bulgarian caves was a good one, the longest cave in Bulgaria, which our guide said was around 25 km in length following some recent discoveries. It was a horizontal system that was mainly walking and climbing, with plenty of pretties and a few crawly sections.

Progress was slow through the system as we were a large group and our Bulgarian guides stopped regularly for a cigarette! During our trip we spotted several CDs on string; it turned out that these were not markers but a novel technique being used to measure radon levels. Apparently, radon causes measurable tiny holes to form in the surface of the CD and can be used to identify radon levels. Trip Time: 5 hours.

Playing with the lights waiting for the rest of the team to catch up. Photograph: 'Urinalka'.





Above, and Left: Our guide had a UV light and he illuminated some of the formations. To our surprise they turned out to be fluorescent. Such pretties were dotted around the cave. Photographs: Sanita Lustika

Right: The Whale formation Photograph: Claire Vivian

Left: Duncan admiring formations. Photograph: Claire Vivian

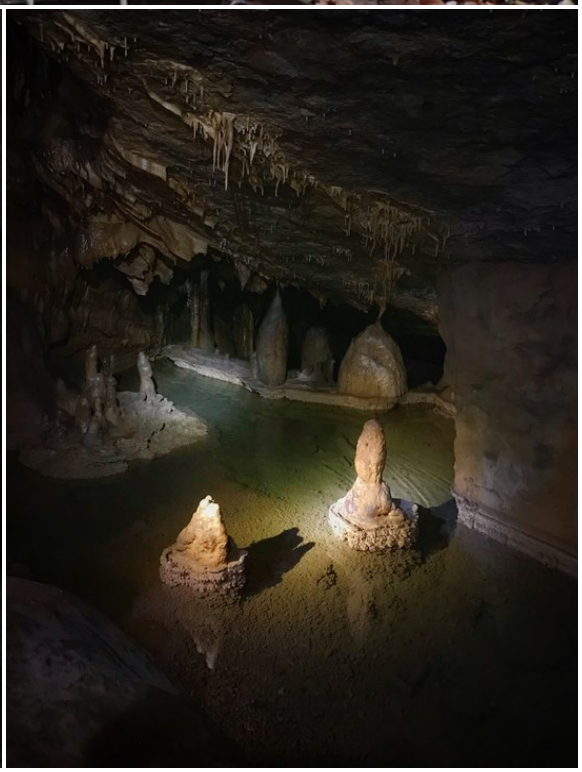
Above: Formations in the passage and hall above 'The Whale'.
Above Right, and Right: Small formations hiding in a Passage.
All three photographs: Sanita Lustika.

And Below:
The Team resting whilst our Bulgarian guides fired up for yet another cigarette break.
Photograph: Duncan Hornby

Elata Cave: (Wednesday 25th September)

This was a short (200 m) but very pretty cave that was reminiscent of Salle de Phantasmos in Coventosa. It was a 2 hour drive north from Eurospeleo, then around a 1 hour uphill walk to the entrance through a predominantly beech forest. The cave entrance was an 18 m pitch off a dodgy, rusting A-frame. Large formations abounded and it was like walking through a forest of stals, ending with a low crawl to the current dig site. Trip time: 2 hours.

Sanita at the entrance pitch. Photograph: Claire Vivian



Above Left: The largest, most sparkly formation in the cave.
Above Right: The lake– our stopping point in the cave. Both photographs: Duncan Hornby

Temnata Dupka - Lakatnik (Thursday 26th September)

Nice, fun and sporty trip which included some traverse wires and ropes, as well as balancing along a water pipe. Again, our trip was a large group which limited the amount of cave system the guides were willing to show. Trip time: 4 hours

Top: Claire and Sanita at entrance of cave listening to the guide explaining the history of the system.
Above: Elina (Finnish caver) traversing above deep pool.

Above: Very early on in the trip there is a high traverse with wire protection.
This photograph: Claire Vivian
All others on this page: Duncan Hornby

Below: Claire illuminating sump. This has been explored by divers and is several hundred metres long.

Below Right: The second sump we saw.

Temnata Dupka - Berende Izvor (Friday 27th September)

An interesting trip indeed! On the final approach to the cave our car was pulled over for a random check by border police. The cave is in Bulgaria but near the Serbian border. Claire and Duncan had left their passports back at the hotel and consequently had no identification. This led to us being politely transferred to the back of the police car to be driven to the police station and told to sit on a bench until our identities were confirmed. Back at the conference site, organizers desperately went through our belongings until official documentation was found, photographed and sent to our guide's mobile phone. Not the intended start of our caving trip! Turns out the cave was only 5 minutes away from the police station.

The entrance is a large muddy sink hole that leads into a large chamber.

Looking up and out of the cave entrance. Photograph: Duncan Hornby

The trip was linear, following the streamway, with sporty climbs above deep pools. The stream bed was a continuous series of gour pools so was quite pretty in places. There were also a fair number of bats.

Stefan our guide seemingly doing the hippy-shake on top of one of the many gour pools we crossed. Photograph: Duncan Hornby

Jari, Finnish caver, passing over a deep pool.
Photograph: Duncan Hornby

Trip time: 3 hours

After the excitement of the police station and the friendly nature of the cave, it made for a great last trip to our 4 day binge on Bulgarian caves.

Conference days (26th - 28th September)

The conference had many presentations run across two rooms, along with photo/video/poster competitions, speleo-olympics and workshops. The final day had various meetings and ended with prizes being awarded, followed by a buffet-style meal for all delegates. Needless to say, the speleo-bar was well attended, which was un-surprising when a large bottle of beer cost 2 lev, which is about £1! The only downside when compared to the UK Hidden Earth was the choice of Bulgarian beer was pretty limited.

Our Bulgarian hosts made us feel most welcome and it was great to meet new and old friends.

The 2020 Eurospeleo will be in Burgos, Spain - get yourselves there!

Conference delegates pose for a photograph on the last day.
Unknown photographer / Public domain.

Svalbard 2019, Coal Mines, Polar Bears and Leave your Rifle Outside!

Allan Richardson

It was all Barbara Lane's fault. She kept waxing lyrical about the delights of Norway, so several of us were persuaded to visit Tromso to see the Aurora in November 2018. This was very successful, though Claire Vivian and I got well chilled on an unsuccessful whale-watching trip. Having got us in the Norway mind set, Barbara then floated the idea of a trip to Svalbard, which was her next cunning plan, whilst talking about polar bears and coal mines to get our attention; she knew exactly which buttons to press and with whom.

Barbara managed to get a good deal on flights and accommodation, and we arrived for a four night stay in May 2019. The harsh landscape had a beauty of its own, as it was still mostly covered in snow and ice, but most of the sea ice had gone and the bird life was starting to arrive as it was now a time of 24hr daylight.

Spitsbergen is the largest of the islands that make up the Svalbard archipelago, well inside the Arctic Circle at 78 degrees north. The main settlement is called Longyearbyen, with most of the rest of the settlements being quite small, or even isolated cabins along the shore.

The initial impression of Longyearbyen was a neatly laid out and very organised small town with the extensive, though now mostly derelict, remains of coal mining all around the town. Our accommodation was in ex-miners' barracks; these were warm and comfortable, with two people per room and a kitchen area on each level, where you made your own breakfast from the Smorgasbord provided.

Above: Svalbard church with aerial ropeways.
Left: Airport fingerpost.
Below: Rifle cabinet in a shop.

Safety

'Leave Your Rifle Outside' was a sign seen outside shops and even the Church, though to be fair they all provided lock up cabinets for your rifle just inside the door. Local laws prohibit anyone leaving the town without either their own rifle or an armed minder. We had an armed minder for all of our excursions, though shooting a polar bear even as a last resort, just before it is about to kill and eat you, is still an offence and you will end up in court - your choice.

Coal Mining

Commercial coal mining on Spitsbergen was started by an American called John Munroe Longyear. The "Arctic Coal Company" started in 1905 and closed in 2017, apart from Mine No 7 (Gruve 7) which supplies coal for the local power plant. The Norwegian mines were closed for a mixture of commercial and environmental reasons. The Russians keep one or two mines going for political reasons, as once they stop mining they will have to leave Svalbard. The politics go back to the Svalbard Treaty of 1920, which was one of the offshoots of the treaty of Versailles after WW1, a fact I was not aware of until I visited Svalbard. The Russians currently have a problem as their mine is running out of coal, a fact which was confirmed by our very open Russian guide.

One of the Norwegian mines above Longyearbyen (Gruve 3) is on basic care and maintenance as it is used as a show mine. Also, as all the mines are drift mines and mostly in the same seams, it is kept open as an airway and a possible emergency escape route from other mines should they re-open.

Left:
Gruve 3, from the airport.

Right:
One of the mine levels.

On the way to the mine we passed one of the World Seed Banks; there is no access and not much to see anyway, we were told. The mine complex itself was just as the miners had left it when the mine suddenly closed during a shift one day; tools on benches, coats on hooks, calendars open on the month of closure etc.

We started off with a description of the geology, history of the mining and the various social aspects. The guide was actually a Dane who had moved to Svalbard on a temporary basis, liked it, and had stayed for several years. He explained that this was quite common, whilst he had not been a miner, he was well informed and knew his subject well. There were maps on the wall showing the geology and the layout of not only the mine we were visiting but also the others in the area.

We were each kitted out with a lamp, self-rescuer and helmet before heading into the workshops, coal handling areas and into the actual drift mine itself. The drift was a single steep decline about three metres square driven partly in coal. The tracks and cables were still in place, as were the derailers to stop runaway trucks. There was a good draught in the tunnel as it was connected to other mines, but the temperature was sub-zero as it was in permafrost. The coal itself was very shiny as it is a type of anthracite. The guide said we could take some samples but warned us that unless we treated it with something like hairspray to seal the surface, it would rapidly disintegrate once it warmed up.

In one of the side levels was a controlled environment storage container. This was an experiment in storing digital materials in sub-zero conditions, and is part of the Arctic World Archive.
All too soon we came to the end of the trip, but the decline continued for some distance, and the guide said that in future they hoped to be able to go further into the mine.

Snowmobiles and an Ice Cave

One of the trips we had signed up for was a trip by snowmobile up the local glacier and down an ice cave. We were able to take turns at driving as long as we had a driving licence, which I found a little strange as we weren't on a road and there was little chance of meeting any other snowmobiles. The ice cave was interesting. It was one long, winding, narrow passage with ice formations. Moving through the cave was a little awkward when you are wearing a thick, padded one-piece suit and a motorbike helmet and visor!

Right:
Claire and guide in an Ice Cave

Wildlife

The group split up, with four going on a wildlife trip with the aim of getting to the mostly-abandoned Russian town of Pyramiden. They didn't get there due to sea ice but had a very good view of a female polar bear and its cub, as well as a somewhat tatty arctic fox.

Two of us went on a separate wildlife trip. We only saw polar bear footprints, but we did get to the Russian town of Barentsburg.

Left:
Barentsburg

Barentsburg

Unlike the open status of Svalbard, Barentsburg was behind secure fencing, to keep the polar bears out and the workers in, for their own safety. Rifles here were not allowed due to the problems with alcohol.

The town was just like being back in Siberia; roads deep in slush and in poor condition, buildings suffering from a lack of maintenance and the bar had no beer, even though it was above the brewery, but it did serve proper Russian vodka in typical Russian shot glasses.
There was also a Post Office with a Norwegian post code.

Trip members

Malcolm Craik, Barbara Lane, Margaret Richardson, Jane Sarginson, Claire Vivian, Allan Richardson.
And yes, it was shorts weather!

Memories Create a Mystery

Researched and Compiled by Bob Hall

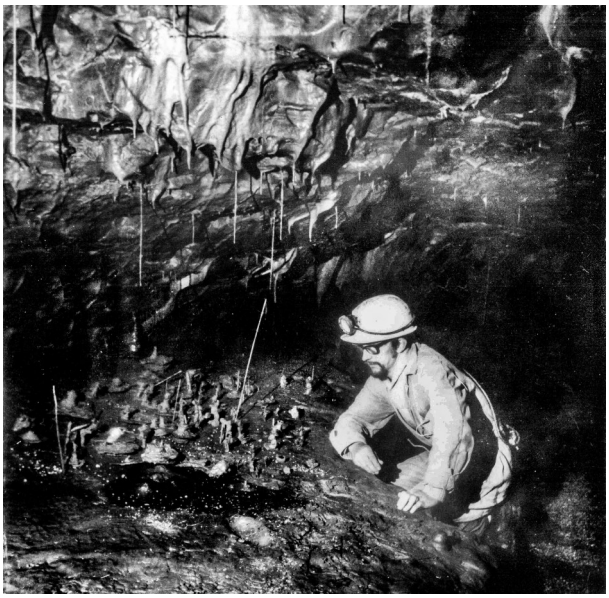
In January 2019 Gary Vaughan sent the following email to the committee:

"Dear all, Please see the email below.
I'm not sure where to start looking for records of the described event.
I'm also mindful of the fact that I found the read compelling and that it may make an excellent article for the approaching newsletter.
Regards, Gary"

Always being on the look-out for Newsletter material I obviously latched on to this straight away. Gary had received an email from an individual called Dai Williams and this is what piqued Gary's and then my interest:

"Dear SWCC Secretary
Thank you for your old and new websites. I wonder if you can help me?
I just found a little booklet called Official Guide to Cathedral Showcave written by Alan C. Coase, then warden of Thornbridge Hall Studies Centre and member of SWCC and BCRA. I guess it may have been written in the late 1970's – after 1975 but when the local phone number was still Abercrave 284!
I went to University College Swansea from 1967-71. I think it was September or October 1967 when I met some cavers who were recruiting for the College caving club. They offered a taster day exploring part of OFD – a very good (and the bit we did was dry) beginner's cave, apart from a very tight squeeze bottom left at the end of a short passage, about 12" high, 5-6ft wide and possibly 10-20 feet long. I survived that and enjoyed the rest.
So I was keen to try their next event which was a visit to Tunnel Cave, near the entrance to the Dan -yr-Ogof show cave but slightly higher on the right. I guess this was October or November 1967, or early 1968.
This was to be a far more challenging adventure. We had two experienced cavers, possibly post-grad students in the university, and about half a dozen novices including me.
We entered via a narrow tunnel 2-3 feet high and 3-4 feet wide, stepping over a low brick wall a few feet outside the entrance. There was a shallow stream with 3-4" water which we clambered through. The tunnel was about 20-30 yards long with 2 or 3 sharp bends. At the end we clambered up through a boulder choke.
Inside there was a large cave, with a smaller one high in one wall. A large passage off to one side had an exquisite miniature forest of what looked like tiny trees, 2-3" high, looking like cedars of Lebanon. These had been made from drips from the ceiling onto a finely layered mud floor.
Soon after we entered what I recall as a long chasm, with a low, round passage at the top about 5-10 feet wide with a ravine in the centre of the floor - a narrow gap varying between 6-18" wide and possible 20 feet deep. I believe it had another tunnel at the bottom where the small river flowed that had cut down through the rock. We navigated this on hands and knees some times each side of the crack with great care not to slip. It was quite technical.
After about half an hour the young woman with one of the guides got scared and asked to go back. He took her back though the tunnel to the entrance (fortunately!).
Unknown to us, heavy rain had started outside and the entrance stream was rising. The guide and woman got out OK but only just. He realised the cave was flooding and alerted someone, possibly the Cave Rescue team.
The rest of us continued through the cave. We had electric headlights. Unknown to me the top of my battery pack unclipped somehow during a lot of crawling and the acid soaked into the hip of my trousers, later giving lasting acid burns. However I was not aware of this at the time.
After a hour or so it appeared that our guide was lost. There were also one or two dull booms far away. After a lot of wandering we got back to the big cave (possibly along the bottom of the Key-hole passage?) and then back to the entrance boulder choke."

A 'NiFe' miner's lamp of the sort Dai confirms he probably used. These did have a habit of leaking caustic alkaline electrolyte (not acid as Dai suggests).



Barry Mawson admires some of the mud formations in Davy Price's Hall which Dai describes. Photograph: Bob Hall (Taken at much the same time as the events discussed.)

"At this stage I was number 2 close behind the leader who seemed agitated. When we got down to the stream it was much deeper and faster. He told me to wait and went along the flooded passage. I heard a couple of shouts and then nothing.

Later we were told that the Cave Rescue team had dynamited off the top couple of layers of bricks in the dam (perhaps the local farmer used the tunnel as a water cistern?) to lower the water level as much as they could though it was still up to ceiling in places. They dare not blast more in case we were coming through.

Then the guided who called the rescue amazingly went back through the tunnel and waited in the water until our leader returned. He must have been there for an hour or more. The leader panicked but the rescue guide got him out.

I was next, unaware what had happened. I was up to my shoulders in the stream for 20-30 feet and then the ceiling came down to the water. I have a good spatial memory and recalled two or three bends between there and the exit. I wanted to discuss with the others but heard shouting and splashing behind. Fearing a new rush of water I took the deepest breath of my life and dived into the flooded tunnel. After a few yards I found the first corner and followed it round. I was running out of breath when a large hand grabbed my collar and pulled me out at the exit. I was OK. I guess the others all got out OK too.

I drove back to College in my mini van. The next day or soon after I borrowed a sledge hammer and went back to the cave and demolished the rest of the wall so others would not have the same problem.

I don't recall any press stories. I gave up caving after that.

However, when I hear the BBC Saturday morning programme which give slots for people to say Thank You to unknown rescuers I vividly remember this incident, but not the name of the caver who raised the alarm, and sat in the tunnel for hours waiting for us.

I wonder if there are any records of this incident in the South Wales Caving Club, or Cave rescue records? Even better with the names of anyone involved in helping us to get out? I would like to say a very big thank you to all involved. But since I am now 72 the cavers may be mid 70s by now.

I returned to Tunnel once years later, to find a large gate and new entrance tunnel, with the old entrance (I guess) just a little culvert on one side. However I did get a copy of the guide book, which I found among old papers this morning.

If you have any further information about this incident or ideally the rescuers, I would be immensely grateful! I would really like to say thank you because they probably save our lives – at least 5 or 6 of us.

I look forward to any information or contact suggestions please.

Kind regards

Dai Williams"

It proved quite easy to begin to get a handle on this story because there was a report on what appeared to be the relevant incident in SWCC Newsletter 53 written by Bryn Thomas (or 'DBT' as we knew him then). This report described an incident, involving a Swansea student party, almost identical to the one described in Dai's email – except the dates didn't match. The published report gives 31st October / 1st November 1965 for the incident whilst Dai's account puts it a couple of years later. I was also able to obtain another report published in 'Speleotawe', 1965, No. 1, which was the UCSCC account of events but added little to Bryn's report.

My obvious response was to suppose that Dai had simply got the year wrong, an easy mistake fifty years down the line. That view was further reinforced by Dai's age, given as 72, which would fit with his being 18 or so, and a 'fresher', in 1965 so a likely candidate for the reported incident. So, I put this to Dai in an email as follows:

"In your first email you say that you are 72, so your year of birth would have been 1946 or 47. So you would have been aged about 20 in the September of 1967. Did you delay going to University by a couple of years? Or have you possibly got the year wrong? If you arrived in Swansea in 1965, aged 18 it would fit with the newsletter report.
Another point is the foot and mouth epidemic which raged from October 1967 through to the spring of 1968. This meant that responsible people were avoiding travel in farming areas. The SWCC closed the HQ for a good few months for this reason. This makes the dates you give for your trip(s) rather unlikely."

Dai responded by confirming that he had worked for a couple of years before starting university in autumn 1967. So, was there another incident, almost identical to the 1965 one but two years later – despite the foot and mouth epidemic?

During this time I had made contact with Terry Moon, Sue O'Reilly and (a little later) Paddy O'Reilly. They had all been UCSCC members in that era, as had a number of other SWCC members, including Pete Ogden, Colin Fairbairn and Ken Maddocks. Sadly, both Colin and Ken are dead, and we lost touch with Pete many years ago. Both Terry and Paddy kept log books of all their caving exploits at that time and they were able to confirm their involvement in the 1965 incident and that Bryn's published report was accurate. However, Paddy went further and emailed in late April 2019 to say:

"Back to the Tunnel cave letter from Dai Williams. Two discrepancies stand out for me: He claims to have been an active caver at the university in 1967 -71 and to have participated in a "rescue" incident in late 1967 or early 68 which is remarkably similar to that which actually took place in October 1965. ***I have scoured my logbooks for the whole of 1967 and 1968 and there is no record of any such incident in Tunnel cave in those years and no record in my logbook of anyone named Dai Williams****. Two things are certain in my mind, I would have a record of him if he caved at all with UCSCC anytime between 1964 and 1970. There is no record of him on any caving trip and no recall of his name whatsoever. The second is my record of the 1965 event makes no mention whatsoever of him as being in any of the parties trapped underground. As one of the three prime organizers of that weekend's caving, neither Terry Moon, Susan nor I recall him or his name or his story. Finally, the reports you dug out make no mention of him or the incident he describes."*

I took this as a pretty definitive job of demolishing Dai's story and I was reminded of a passing comment Dai made in an email in February 2019, referring to the published reports I had sent him.

"The spookiest bit was that I arrived in Swansea in late September 1967. And October 67 had about 10 inches of rain I recall. Not good caving weather.
My incident might have been between November 67 to spring 68, or possibly winter 68/69.
Or … did they tell us the story of the 1965 rescue after we did OFD as our first trip and did I dream that I was involved? The memories and scars seemed real. *And the police car that stopped me for speeding a few days later after demolishing the dam with a sledge hammer. They were very understanding!*
It seems weird that the UC Swansea Caving Club might have had two rescues from Tunnel in 2-3 years? The farmer might have been fed up with people demolishing his dams regularly! But would you mind checking if there was another event?"

The sentence highlighted in this email from Dai seems the most probable explanation of this peculiar business, given that Paddy is quite certain that there was no 'second event'.

Postscript:

I arranged to meet Dai at the HQ in February and took him on a very short 'bimble' inside Top Entrance which he thoroughly enjoyed. My conversations with him over a couple of hours did nothing to alter my conviction that he had somehow constructed a detailed 'memory' from second-hand accounts of the 1965 incident. And then, some months later I received the following email from Dai:

"Dear Bob
Sorry to disturb you but I understand Radio 4 Saturday Live may have a brief tribute to the Tunnel Cave rescue we discussed.
It is probably just a 2-3 minute pre-recorded interview in their "Thank you's" item. Prob between 9 and 9.30 am. If they do play it then it may also be on iplayer. "

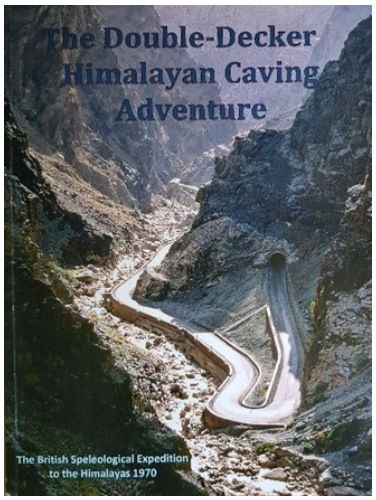
That broadcast did indeed take place on Saturday 27th April 2019 and Dai handsomely thanked those 'persons unknown' for saving his life all those years ago.

Acknowledgements.
Many thanks to the following people who have assisted me by scouring their personal archives, researching, copying and otherwise providing support:
Sue Goodhead, Terry Moon, Susan O'Reilly, Paddy O'Reilly, Jem Rowland, Mary Wilde (BCA librarian) and of course Dai Williams himself.

Dai Williams emerging from his'bimble' in Top Entrance. Photograph: Dai Williams

Book Review
'The Double-Decker Himalayan Caving Adventure'

Fred Levett



On 2nd August, 11 men from Northern England Exploration Group packed up and departed for a caving trip to the Himalayas. For those mentally reaching for their i-pad, flight timetables, previous expedition reports, digitised mapping, digital camera and LED light, it's time to put those in a box marked 'future', together with your smartphone. This is not 2018, it is nearly 50 years earlier, 1970. Substitute: give up your job, be away 5 months, start writing letters, trace a few maps, pack your carbide and buy a second-hand Leyland Titan. "A what?" That's a double-decker bus, ex Preston Corporation.

For those who detect a whiff of nostalgia in the words that follow it's because, for those enthusiastic cavers of a mature age, an overland trip to 'exotic' places was a rite of passage. It was for me. So, what exactly did you have at your disposal? Well, there was what you knew, who you knew, resourcefulness, skill and the ability to dig deep into inner reserves of stamina and tenacity, still the hallmark of cavers the world over. There was also a worldly naivety; we were significantly more insular.

Back to the story: the book has been recently written by John Conway, the deputy leader of the expedition, and Creedy and Hewitt. It draws on the original members' logs and letters, pictures and recollections. Written in modern times it has the opportunity for a certain amount of reflection and comparison that improves the flavour. The description of the journey out, written in a day by day format travelling through Europe (with borders), Turkey, Iran, Afghanistan, Pakistan and finally into India could be seen as a rather dry formula until you appreciate the masterpiece of northern understatement of the writing style. The exploits in the preparation phase, accumulating money, equipment, visas, maps, vehicle papers (including the carnet and route from the RAC) highlight the challenges of travelling even across Europe.

Once underway, after a grand night out, the challenge of a double-decker becomes immediately apparent, requiring ever increasing resourcefulness culminating in finding, at the German border, a maximum height limit of 4.1 metres in the country. In a bus standing 4.42 metres high a solution must be found! As always with a journey it's who you meet along the way that adds spice and you sense the lads' expanding skills and experience. You start by thinking, "this can't go well", and could be surprised 40 pages later to arrive safely and wiser in Arki; but no, by this time you have learned not to underestimate the tenacity of a bunch of 70's cavers.

Now for some caving! The ensuing investigation of the area and cave exploration reflect the challenges of the times. With minimal mapping, uncertain public transport, carbide lighting and unreliable translation, the toughness and resilience of the team shines through. In context, it contributed significantly to the knowledge of the caves. Each entrance found, each survey completed and the terrain crossed and re-crossed is a testament to their determination. In the context of modern times the achievements seem modest, but that is through the eyes of modern communications, the ubiquitous 4x4, GPS, SRT kit and ready access to internet-based information.

Some caves were, in various combinations, water supplies, religious sites, bat roosts and homes to evil spirits. Each represented a challenge to investigate and often much negotiation. For photographers, each picture represented a valuable expenditure of film, each extra roll of film a trip to the post office to despatch it to a far-away processing lab and the uncertain wait for its return. Each result, weeks later, a triumph or disaster. By then the subject was long gone.

Caving was an unusual activity in rural India in the 70's and the exploits of the team provide a window to the workings of society, local government and the terrain at that time.

Finding thin pickings locally the team conducted some 'away trips' as their confidence increased. To really appreciate the undertaking it is important to have carried a loaded tackle sack for a day. They did it day after day across hostile terrain, in areas mysteriously restricted to travellers, acquiring the basic necessities from the land or curious local inhabitants.

Eventually on day 122 the time came to return home. With a lighter bus (They'd eaten all the food! – See Appendix 4), battle hardened and retracing old ground what could go wrong? A clue is in the date, 1st December. Coming out, the extreme heat of high summer was ever present. Now the temperature dropped…….and dropped.

Because of the way the narrative has been compiled there is only minimal personal testimony. This is a great shame as I would have liked to learn more about the lads as individuals as they face what would be, by their own declaration, a life changing experience. The benefit of the recent writing of this book, driven by an increasing sense of mortality, is the ability to top and tail it in the context of modern society.

I commend this book to those of a certain age, who like me had a taste of adventure by such road trips. It rekindles many half-forgotten memories. Also, for those who are younger, dip into this and feel the excitement of the pre-digital age. The sheer grit and determination to make something happen.

As a footnote I should mention that the expedition had two patrons. One was Brigadier Edward Aubrey Glennie, Director of the Survey of India in the early 20th Century and a former President of the South Wales Caving Club!

The Double-Decker Himalayan Caving Adventure.
J Conway, D Creedy and H Hewitt, 2019, 160 Pages.
SWCC Library number 2064.

Readers may also be interested in a DVD presentation, first shown at Eurospelo 2016 titled: 'India or Bust: A Caving Trip by Double-Decker Bus'
The above image is taken from promotional material for that DVD.